

IBM TotalStorage[®] DS6000



Command-line interface

IBM TotalStorage[®] DS6000



Command-line interface

Note:

Before using this information and the product it supports, read the information in "Notices" on page 549.

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Contents

Tables	vii

Notices and publication information . . .	ix

Safety notices	ix
Environmental notices	ix
Product recycling and disposal	ix
Battery return program	x
How to send your comments	xi

Chapter 1. Command-line interface	1

Chapter 2. Operating systems that support the DS command-line interface . . .	3

Chapter 3. Upgrading your DS CLI	5

Chapter 4. DS CLI operational limitations . . .	7

Chapter 5. Installing the DS CLI	9

DS CLI preinstallation information	9
Mounting the DS CLI installation CD	12
Installing the DS CLI application using the graphical mode	13
Installing the DS CLI using the console mode	16
Installing the DS CLI using the unattended (silent) mode	22
Correcting the JVM-not-found error	26
Installing DS CLI on an OpenVMS system	27
Preparing to install the DS CLI on an OpenVMS System	27
Installing the DS CLI on your OpenVMS system	28
Using the DS CLI on an OpenVMS system	32

Chapter 6. Completing DS CLI postinstallation	35

Using the DS CLI application	35
Logging into the DS CLI application	36
Using the DS CLI single-shot command mode	37
Using the DS CLI script command mode	38
Using the DS CLI interactive command mode (history and reports)	39
Obtaining the serial (storage image ID) number using the DS CLI	40
DS CLI command help	40
Obtaining and interpreting DS CLI exit codes	42
Activating your machine and feature licenses using the DS CLI	44
Enabling remote support using the command-line interface	45
Setting up contact information using the DS CLI	45
Setting up Call Home (SMTP) notifications using the DS CLI	47

Setting up your account information using the DS CLI	48
Activating the Call Home function using the DS CLI	49
Setting up SNMP notifications using the DS CLI	50
Setting up SIM notifications using the DS CLI	51
Setting up user accounts using the DS CLI	51
Creating a default configuration setup with a profile file	53
Registering for the My Support function.	58

Chapter 7. OpenVMS system integration	61

Enhancing the command console LUN for DS CLI use	61
Enhancing the OpenVMS system messages	62
Enabling OpenVMS to use the DS CLI help	62
Java Runtime Environment considerations for DS CLI	63
Quota considerations for DS CLI	64

Chapter 8. Configuring and managing logical storage	65

Configuring new fixed block storage using the DS CLI	65
Creating extent pools for fixed block volumes using the DS CLI	65
Creating arrays for fixed block volumes using the DS CLI	67
Creating a rank using the DS CLI	68
Creating fixed block volumes using the DS CLI	69
Creating LUN volumes for System i systems	71
Correcting a fixed block configuration error	73
Creating fixed block volume groups using the DS CLI	73
Creating a volume group for System i systems	74
Configuring fibre-channel I/O ports using the DS CLI	76
Creating SCSI host port connections using DS CLI	77
Configuring new count key data storage using DS CLI	79
Creating count key data extent pools using the DS CLI	80
Creating arrays for CKD volumes using the DS CLI	81
Creating a rank for CKD volumes using the DS CLI	82
Creating logical control units for CKD volumes using DS CLI	83
Creating count key data volumes using the DS CLI	85
Correcting a CKD volume configuration error	86
Configuring fibre-channel I/O ports using the DS CLI	87

Managing your logical storage configuration	88
Using DS CLI commands on i5/OS	88
Modifying an extent pool.	91
Viewing extent pool status	91
Viewing extent pool properties and performance metrics	92
Deleting extent pools from a storage configuration	92
Viewing the array disk drive module status	93
Viewing array status	94
Viewing properties for one array	95
Removing arrays from a storage configuration or a rank assignment	95
Adding a rank to an extent pool	97
Modifying a rank	97
Viewing rank status	99
Viewing properties for one rank	99
Correcting a rank-related configuration error	100
Removing ranks from a storage configuration	100
Modifying a logical control unit	101
Viewing logical control unit status	102
Viewing properties for one logical control unit	103
Removing logical control units from a CKD storage configuration	103

Chapter 9. Copy Services functions 105

FlashCopy functions	105
Creating a FlashCopy relationship	105
Creating a persistent FlashCopy relationship	106
Viewing information about FlashCopy relationships.	106
Deleting FlashCopy relationships.	108
Creating remote FlashCopy transactions	109
Resynchronizing FlashCopy relationships	110
Reversing a FlashCopy relationship	111
Applying the FlashCopy revertible option to existing FlashCopy relationships	112
Starting a background copy of a FlashCopy relationship	113
Preventing write operations on FlashCopy target volumes	114
Creating a FlashCopy target volume on an existing Metro Mirror source volume	115
Discarding changes to FlashCopy target volumes	116
Committing data to FlashCopy target volumes	117
Metro Mirror functions	118
Displaying the status of established paths	118
Displaying the WWNN of a storage unit	118
Creating remote mirror and copy paths.	119
Correcting a path-related configuration error	120
Removing paths	121
Creating a Metro Mirror relationship	122
Creating a Metro Mirror consistency group	123
Resuming a Metro Mirror relationship	124
Pausing a Metro Mirror relationship.	125
Creating a Global Copy relationship.	126
Deleting a Metro Mirror relationship	127
Modifying logical subsystem timeout values	127
Defining a path that has the consistency option enabled	131

Monitoring Remote Mirror and Copy paths	131
Performing a failover recovery operation	132
Performing a failback recovery operation	132
Viewing information about Metro Mirror relationships.	133
Converting Global Copy volume pairs to synchronous.	134
Determining which I/O ports are available for paths	134
Deleting a single volume Metro Mirror relationship	136
Copy Services functions across a 2105 and 1750	137
Creating a Metro Mirror volume pair between a 1750 and a 2105	137
Global Mirror functions	139
Adding volumes to a session (Global Mirror)	140
Modifying the tuning parameters of a Global Mirror session	141
Modifying the topology of a Global Mirror session	142
Viewing a Global Mirror session	144
Querying Global Mirror processing	145
Pausing Global Mirror processing	145
Resuming Global Mirror processing	146
Starting Global Mirror processing	146
Ending Global Mirror processing (script mode)	147
Ending Global Mirror processing (no script)	147
Setting up the Global Mirror Environment.	148
Removing a Global Mirror environment	153

Chapter 10. Recovering from a disaster using Global Mirror 161

Ending Global Mirror processing when a disaster occurs.	162
Checking Global Mirror transaction status in a disaster situation	163
Initiating failover processing for B volumes to A volumes	164
Analyzing and validating the consistency group state	165
Using the revertflash command to correct FlashCopy relationships	167
Using the commitflash command to correct FlashCopy relationships	168
Using fast reverse restore processing to create consistency	169
Waiting for the background copy to complete	170
Reestablishing the FlashCopy relationships between B volumes and C volumes	171
Preparing to reinstate production at the local site	172
Resynchronizing the volumes	173
Querying, quiescing, and querying	174
Reestablishing remote mirror and copy paths (site A to site B)	175
Performing Global Copy failover processing to the A volumes	177
Performing Global Copy failback processing for the A volumes	177
Resuming Global Mirror processing at site A	178

Chapter 11. CLI commands 181

About CLI commands	181
Understanding the syntax diagrams	182
List of commands	183
Command flags	198
Command equivalents	200
Output field descriptions	205
Messages in the CLI and management console	
server	216
Framework command	217
dscli	217
exit	219
help	220
quit	220
setoutput	221
User account and security commands	224
chpass	224
chuser	225
lsuser	227
managepwfile	228
mkuser	230
rmuser	232
showpass	233
showuser	233
Application key and version commands	234
applykey	234
lskey	235
ver	236
Physical enclosure information commands	237
lsstgencl	237
Physical resource information commands	240
lsddm	240
Storage unit configuration commands	244
chsu	245
lssu	245
showsu	247
Storage image configuration commands	250
chsi	250
diagsi	251
lsserver	252
lssi	254
showsi	257
I/O port and host connection configuration	
commands	259
Storage image I/O port commands	259
Host connection commands	268
Storage configuration commands	289
Array site specific commands	289
Array specific commands	293
Rank specific commands	302
Extent pool specific commands	313
Address group specific commands	322
Logical control unit specific commands	324
CKD logical volume specific commands	333
Logical subsystem specific commands	352
Fixed block logical volume specific commands	356
Volume group specific commands	377
Advanced operation commands	386
Copy Services commands	387
FlashCopy commands	388
Remote FlashCopy commands	406

Remote Mirror and Copy path commands	424
Remote Mirror and Copy pair commands	437
Global Mirror commands	467
Audit commands	490
offloadauditlog	491
DS6000 remote support and notification commands	494
setplex	495
showplex	496
setdialhome	499
setsmtp	499
setsnmp	500
setsim	501
setcontactinfo	502
showcontactinfo	514
testcallhome	515
DS6000 PE package commands	515
offloadss	516
mkpe	517
sendss	520
sendpe	520
lsss	521
lspe	523
DS6000 problem log commands	524
closeproblem	524
lsproblem	525

Chapter 12. Removing the DS6000 command line interface 529

Removing the DS CLI using unattended (silent)	
mode	529
Removing the DS CLI using the console mode	529
Removing the DS CLI from your system using	
graphical mode	530
Removing the DS CLI from an OpenVMS system	531
Removing the DS CLI from a System i system	531
Removing the DS CLI using your System i	
system directly	532
Removing the DS CLI from your System i	
system using the remote method	532

Chapter 13. Command-line interface scenarios 535

Modifying fixed block volume groups	535
Deleting data storage configurations	536
Deleting a fixed block data storage	
configuration	536
Deleting a count key data storage configuration	540
Processing remote FlashCopy (inband) transactions	543
Configure support options using the DS CLI	544
Metro Mirror test scenario: failback operation from	
local to remote site	545
Allowed remote mirror and copy volume pair	
conversions	547

Notices 549

Accessibility	550
Trademarks	551
Terms and conditions	552
Electronic emission notices	553

Federal Communications Commission (FCC)	
statement.	553
Industry Canada compliance statement.	553
European Union EMC Directive conformance	
statement.	553
Japanese Voluntary Control Council for	
Interference (VCCI) class A statement	555

Korean Ministry of Information and	
Communication (MIC) statement	555
Taiwan class A compliance statement	555

Index	557

Tables

1. Profile variables	54	2. Country and Region Codes	506

Notices and publication information

This section contains information about safety notices that are used in this guide, environmental notices for this product, publication information, and information about sending your comments to IBM.

Safety notices

Complete this task to find information about safety notices.

To find the translated text for a danger or caution notice:

1. Look for the identification number at the end of each danger notice or each caution notice. In the following examples, the numbers **1000** and **1001** are the identification numbers.

DANGER

A danger notice indicates the presence of a hazard that has the potential of causing death or serious personal injury.

1000

CAUTION:

A caution notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury.

1001

2. Find the number that matches in the *IBM System Storage Solutions Safety Notices for IBM Versatile Storage Server and IBM System Storage Enterprise Storage Server, GC26-7229*.

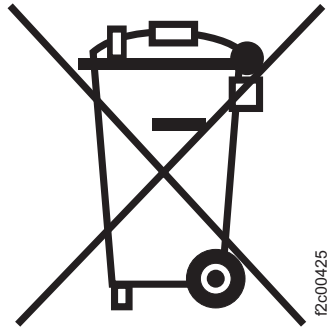
Environmental notices

This section identifies the environmental guidelines that pertain to this product.

Product recycling and disposal

This unit contains recyclable materials.

This unit must be recycled or discarded according to applicable local and national regulations. IBM® encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products. Information on IBM product recycling offerings can be found on IBM's Internet site at <http://www.ibm.com/ibm/environment/products/prp.shtml>.



Notice: This mark applies only to countries within the European Union (EU) and Norway.

Appliances are labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

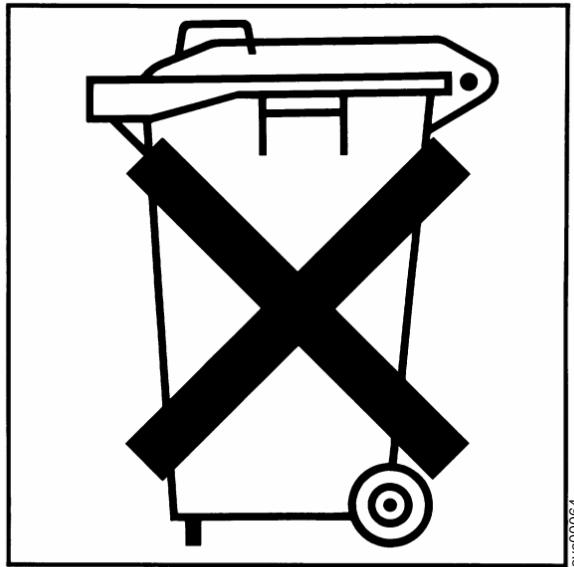
In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE. For proper collection and treatment, contact your local IBM representative.

Battery return program

This product may contain sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to <http://www.ibm.com/ibm/environment/products/index.shtml> or contact your local waste disposal facility.

In the United States, IBM has established a return process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and other battery packs from IBM Equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Please have the IBM part number listed on the battery available prior to your call.

In the Netherlands the following applies:



For Taiwan:



Please recycle batteries.

廢電池請回收

How to send your comments

Your feedback is important to help us provide the highest quality information. If you have any comments about this information or any other DS6000™ series documentation, you can submit them in the following ways:

- e-mail

Submit your comments electronically to the following e-mail address:

starpubs@us.ibm.com

Be sure to include the name and order number of the book and, if applicable, the specific location of the text you are commenting on, such as a page number or table number.

- Mail

Fill out the Readers' Comments form (RCF) at the back of this book. Return it by mail or give it to an IBM representative. If the RCF has been removed, you can address your comments to:

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Chapter 1. Command-line interface

This section provides information that is related to using the command-line interface (CLI). Topics include a list of commands, command flags, understanding the syntax diagrams, 2105 to 2107 equivalent commands, output field descriptions, framework commands, storage configuration commands, I/O port and host connection configuration commands, and Copy Services commands.

Chapter 2. Operating systems that support the DS command-line interface

You can install the DS command-line interface (CLI) on machines that use one of the following operating systems:

- AIX 5.1, 5.2, 5.3
- HP-UX 11.0, 11i, v1, v2
- HP Tru64 version 5.1, 5.1A
- Novell Netware 6.5
- System i system i5/OS 5.3
- OpenVMS 7.3-1 (or newer)
- Sun Solaris 7, 8, 9
- Windows 2000, Windows Datacenter, Windows 2003, and Windows XP

Note: The DS CLI cannot be installed on a Windows 64-bit operating system.

Chapter 3. Upgrading your DS CLI

You can upgrade your system to use DS CLI by following the removal and installation procedures for the DS CLI. However, there are considerations that you must evaluate before you make this upgrade.

DS CLI to DS CLI

As part of your upgrade preparation, consider the following:

- An upgrade requires that you remove the existing DS CLI and that you install the upgraded DS CLI. This is the most certain way to ensure that you receive an error-free installation. However, this removal and install process can be a concern where you have customized the system profile file. A reinstallation can most likely overwrite your current system profile file. If you want to keep your current system profile file, perform the following actions:
 - Make a copy of your current system profile file and save it in a convenient place.
 - Merge the saved system profile file into the new system profile in the DS CLI installation directory after the installation has completed. This allows you to keep any customized variables, and retain any new variables in the system profile file that was installed with the upgraded DS CLI.

Note: Personal profiles that are not saved under the DS CLI installation directory are not affected by the upgrade process.

- Upgrades on some Linux operating system distributions (for example, SLES 10 and Red Hat Enterprise Linux 4 and 5) might experience a problem if you try to use the `setuplinux.sh` and `uninstaller.sh` scripts. This is because these operating systems deprecate the Linux Threads model in favor of NPTL. If this is your experience, try using the following:
 - To install the DS CLI, use the `sl_internal.bin` file instead of the `setuplinux.sh` script which is found in the same directory as the `setuplinux.sh` script. You can use the same flags that are available for the `setuplinux.sh` script, such as, `-is:javahome`, `-silent` or `-console`. The following is an example of the command that you can use:

```
/cdrom/sl_internal.bin -is:javahome /opt/ibm/java2-142 -console
```
 - To uninstall the DS CLI, use the `ui_internal.bin` file instead of the `uninstaller.sh` script which is found in the same `_uninst/` directory. You can use the same flags that are available for `uninstaller.sh`, script such as, `-is:javahome`, `-silent`, or `-console`. The following is an example of the command that you can use:

```
/opt/ibm/dscli/_uninst/ui_internal.bin -is:javahome/opt/ibm/java2-142 -console
```

Copy Services CLI to DS CLI

The Copy Services CLI that came with the ESS 2105 can be replaced with the DS CLI with changes. The DS CLI is designed to support the following features that exist on the IBM TotalStorage Enterprise Storage Server® (ESS) Models 750 and 800:

- A Copy Services domain that is configured as part of the IBM TotalStorage Enterprise Storage Server (ESS) Models 750 and 800.
- All available Copy Services functions on the ESS 2105, including FlashCopy Version 2 and PPRC Version 2 licenses.

However, the DS CLI is not designed to support the Copy Services CLI scripts that you have written for the ESS 2105. You must modify these scripts or write new ones to accommodate the upgrade. Consider the following:

- Individual Copy Services tasks in the Copy Services CLI are replaced by individual DS CLI commands. Saving a DS CLI command to a shell script is the equivalent of saving a 2105 Copy Services task.
- Grouped Copy Services tasks can be replaced by built-in DS CLI scripts that use the -script parameter. This works even in environments that do not have command line shells. The grouped tasks can also be replaced by shell scripts in environments that support command line shells.
- Shell scripts that are used to invoke saved 2105 Copy Services tasks must be rewritten to invoke the equivalent DS CLI commands and scripts.
- In a mixed ESS 2105 and DS8000 environment, only the DS CLI can perform Copy Services functions between the ESS and the DS models.

ESS CLI to DS CLI

The ESS CLI that came with the ESS 2105 cannot be replaced with the DS CLI. Logical configuration commands for the 2105 are not supported in the DS CLI and you must use the existing 2105 ESS CLI for this purpose.

Note: The ESS CLI and DS CLI cannot be installed on the same system.

Chapter 4. DS CLI operational limitations

There are operational limitations that are associated with the use of the DS CLI.

These limitations are described as follows:

- Volumes in the same volume space, logical subsystem (LSS), logical control unit (LCU), or address group cannot be of mixed type. They are either fixed block or count key data (CKD).

Note: The volume space is called an extent pool. An extent pool contains one or more ranks of a common storage type (fixed block or CKD).

- Logical subsystems cannot be created using the DS CLI. A fixed block LSS is automatically created when your first fixed block volume is assigned to the LSS address space. A fixed block LSS is automatically deleted when the last fixed block volume is removed from an LSS address space.

Note: You can use DS CLI commands to create, modify, and delete logical control units (LCUs), which are the CKD volume equivalent of a fixed block LSS.

- If you are using the Cisco MDS 9216 Multilayer Fabric Switch, you must not enable its write acceleration feature. The Remote Mirror and Copy commands might fail if the write acceleration feature is enabled.
- A maximum of 256 volumes for each logical subsystem can be defined.
- You must not start more than 100 DS CLI sessions simultaneously. Starting more than 100 DS CLI sessions simultaneously can result in connection problems.
- You cannot install the DS CLI on a Windows 64-bit operating system.

Chapter 5. Installing the DS CLI

The topics in this section provide information that is related to installing the DS CLI, including preparing for the installation and installing in unattended (silent) mode, console mode, graphical mode, and on an OpenVMS system.

DS CLI preinstallation information

The IBM System Storage™ DS command-line interface (CLI) enables open systems hosts to invoke and manage FlashCopy and Metro and Global Mirror functions through batch processes and scripts. This information provides key considerations when you initiate a DS CLI installation on the various supported operating systems.

Specific preinstallation concerns

Consider the following specific concerns as you prepare to install the DS CLI on a DS series machine type that uses a supported operating system.

DS6000 preinstallation specifics

After installation and before you can use the DS CLI commands on a DS6000 machine type, be aware of the following requirements:

- Your management console must be equipped with the DS Storage Manager graphical user interface (GUI).
- The GUI must have been installed as a full management console installation.
- Your storage unit must be configured. You must use the DS Storage Manager for this initial configuration. The configuration process includes the following tasks:
 - Selecting your storage complex
 - Assigning your storage unit to the storage complex
 - Designating network information for the storage unit

DS8000 preinstallation specifics

There are no preinstallation concerns for the DS8000.

General preinstallation specifics for supported operating systems

The following list provides information that helps you prepare for the installation of the DS CLI application on one of the supported operating systems. This information includes the list of the installation file name that you must use with each supported operating system, the default directory name where the DS CLI application is installed, and the version of Java that you must have installed on your system.

- The following table provides the installation file name, by operating system, that you must use to install the DS CLI application.

Supported Host Systems	Installation File Name
IBM AIX (5.1, 5.2, 5.3)	setupaix.bin
Hewlett-Packard-UX (11.0, 11i, v1, v2)	setuphp1020.bin or setuphp11x.bin

Supported Host Systems	Installation File Name
Linux (Red Hat 3.0 Advanced Server [AS] and Enterprise Server [ES]), RHEL 4, RHEL 5 Note: See the additional instructions following this table.	setuplinux.bin for xSeries setupgenericunix.sh for pSeries
SUSE Linux SLES 8, SLES 9, SUSE 8, SUSE 9, SLES10 Note: See the additional instructions following this table.	setuplinux.bin for xSeries setupgenericunix.sh for pSeries
Sun Solaris (7, 8, 9)	setupsolarisSparc.bin
HP Tru64 (5.1, 5.1A)	setupgenericunix.sh
Novell Netware 6.5	setupwin32.exe
System i system i5/OS 5.3	Add -os400 at a command line after the name of the installation file. For example, setupaix.bin -os400
OpenVMS 7.3-1 (or newer)	See the topic group that describes how to install, use, and remove the DS command-line interface in an OpenVMS environment.
Windows 2000, Windows Datacenter, Windows 2003, and Windows XP	setupwin32.exe
UNIX users that do not have an X display Note: Use the same installation file name for your host operating system as shown in the previous rows, but add the -console parameter after the installation file name. For example: setupaix.bin -console setuplinux.bin -console	setupos.bin -console Where <i>os</i> represents the name of your operating system as shown in the previous rows.

- The DS CLI cannot be installed on a Windows 64-bit system.
- You must have installed Java 1.4.1 or later on your system. The installation program checks for this requirement during installation and does not install the DS CLI if you do not have Java 1.4.1 or later. The DS CLI installation CD contains Java 1.4.2, which you can install if your system is not equipped with this version of Java.
- You must use the ksh (Korn shell) or bash (Bourne again shell) shell if you are installing on a HP Tru64. Installshield does not support the sh shell. You must perform all HP Tru64 installations using the **setupgenericunix.sh** file that is located on the installation compact disc.
- For an AIX installation:
 - The LIBPATH environment variable can interfere with the installation of the DS CLI and can result in the display of the JVM-not-found error. To avoid this interference, you must disable the LIBPATH environment variable before you install the DS CLI. After the installation of the DS CLI, you must enable the LIBPATH environment variable so that it can be used with other applications.
 - Run the following commands to sequentially disable the LIBPATH environment variable, install the DS CLI, and restore the LIBPATH environment variable:


```

export LIBSAVE=$LIBPATH
unset LIBPATH
setupaix.bin -is:javahome /opt/ibm-Java-whatever/java/bin
export LIBPATH=$LIBSAVE
unset LIBSAVE

```

- For a System i system installation:

Note: The installation of DS CLI on a System i system is done remotely from a Windows, AIX or another system platform. You cannot install the DS CLI directly on a System i system.

The System i system and i5/OS must meet the following requirements before the DS CLI can be installed:

- Prerequisites
 - The latest Java group program temporary fixes (PTF)
 - i5/OS 5722-SS1 option 34 - Digital certificate manager
 - Licensed product 5722-AC3 option *base - Crypto Access Provider 128 bit
 - Licensed product 5722-DG1option *base - IBM HTTP Server for iSeries
 - Licensed product 5722-JV1 options 6 - Java Developer Kit 1.4
 - The latest cumulative PTF package that is installed on the i5/OS
- If you are installing onto a System i system, ensure that the workstation that you are installing from is network-attached to the iSeries server.
- During the installation of the DS CLI application onto a System i system, you must provide the following information:
 - The name of the iSeries server to which you are installing the DS CLI application.
 - The user name and password that is used to access the designated iSeries server.

- The installation process installs the DS CLI in the following default directories:

AIX /opt/ibm/dscli

HPUX /opt/ibm/dscli

Linux /opt/ibm/dscli

Sun Solaris
/opt/ibm/dscli

Windows
C:\Program Files\IBM\dscli

HP Tru64
/opt/ibm/dscli

iSeries
/ibm/dscli

Novell Netware
SYS:\dscli

- Regardless of the operating system and DS series that you use, you must activate your license activation codes (part of DS Storage Manager postinstallation instructions) before you can use the CLI commands that are associated with Copy Services functions.

Mounting the DS CLI installation CD

Before you can initiate the DS CLI installation, most systems require that you mount the DS CLI installation CD. These instructions describe how to mount the installation CD on each of the supported operating systems. The Windows operating system does not require that you mount the CD. Because the OpenVMS system has additional installation requirements, the installation instructions for the OpenVMS system are explained in a separate topic.

Perform the following steps to mount the DS CLI installation CD in preparation for the DS CLI installation:

1. Log on to your host system as a root user or administrator.
2. Insert the DS CLI product CD into the CD drive. If a window opens for the CD drive, close the window.
3. Mount the CD drive using the **mount** command according to your system. You can mount your CD drive using the following examples:

AIX Create a directory for the CD-ROM by issuing the following command:
`mkdir /cdrom -p`

Create a file system for the CD-ROM by issuing the following command:

`crfs -v cdrfs -p ro -d cd0 -m /cdrom`

where *cd0* represents the CD-ROM drive.

Mount the CD-ROM file system by issuing the following command:

`mount /cdrom`

HPUX Mount the CD-ROM file system using the path name for your environment by issuing the following commands:

`ioscan -funC disk | more`
`mount /dev/dsk/c?t?d? /<cdrom>`

Linux Issue the following command on Red Hat systems:

`mount /dev/cdrom`

Sun Solaris

Issue the following command:

`mkdir /mnt`
`mount -F hsfs -r /dev/dsk/c0t6d0s2 /mnt`

Note: The device name `/dev/dsk/c0t6d0s2` is the default name for Sun Solaris. The device name might be different on your system depending on your hardware configuration.

Windows

You are not required to mount the CD if you are using this operating system.

HP Tru64

Issue the following command:

`mount -t cdfs -o noversion /dev/rznn /mnt`

where *nn* represents the number of CD-ROM drives.

Novell Netware

You are not required to mount the CD if you are using this operating system.

4. Navigate to your CD drive and proceed with either the unattended (silent), console, or graphic installation.

Installing the DS CLI application using the graphical mode

Complete this task to install the DS CLI application on your system using the graphical installation mode.

Users of Windows, Novell, UNIX, and System i systems can install the DS CLI using the graphical mode. Consider the following before you perform the installation of the DS CLI application:

- You cannot install the DS CLI on a computer that contains the ESS CLI.
- You cannot install the DS CLI on a Windows 64-bit operating system.
- You must have a version of Java 1.4.1 or higher that is installed on your system in a standard directory. The DS CLI installer checks the standard directories to determine if a version of Java 1.4.1 or higher exists on your system. If this version is not found in the standard directories, the installation fails.
The DS CLI installation CD contains the Java 1.4.2 version. You can install this version from the CD and continue with the installation of the DS CLI application.
- If the DS CLI application was installed on your client or host machine in the past, ensure that you end any active sessions of the DS CLI before you run the DS CLI installation CD.
- If you are installing onto a Novell system, you are directed to provide the following information:
 - The directory where your Windows drive is mapped
 - The location of the JAVA_HOME environment variable. The JAVA_HOME environment variable is where the Java runtime environment file is installed. The DS CLI application requires the appropriate java runtime environment location to use during the installation process.
- System i and i5/OS installations have the following requirements:
 - The latest Java group program temporary fixes (PTF)
 - i5/OS 5722-SS1 option 34 - Digital certificate manager
 - Licensed product 5722-AC3 option *base - Crypto Access Provider 128 bit
 - Licensed product 5722-DG1option *base - IBM HTTP Server for iSeries
 - Licensed product 5722-JV1 options 6 - Java Developer Kit 1.4
 - The latest cumulative PTF package installed on the i5/OS
 - The machine that you are installing from must be connected to the i5/OS through an IP connection.

You can install the DS CLI application using the graphical mode with the help of an installation wizard. Before you can use the DS CLI, some operating systems require that you restart your system after the installation is complete. Or, you might be required to open a new command prompt window to start a DS CLI session.

Note: After you install the new version of DS CLI, your old DS CLI sessions might be unusable.

Perform the following steps to install the DS CLI application using the graphical mode:

1. Start the setup file that is appropriate for your operating system.

If you are installing the DS CLI application on any system other than a System i system, the Welcome window is displayed.

If you are ultimately installing the DS CLI onto a System i system, add **-os400** to your command that includes the setup file. For example, `setupwin32.exe -os400`

Initially (for all types of installation), the DS CLI installer checks your standard directories for the correct version of Java. If the correct version of Java is not found, you receive the following message:

A suitable JVM could not be found. Please run the program again using the option `-is:javahome <JAVA HOME DIR>`

The manner in which you respond to this message depends on your operating system and your installation environment settings. **Correcting the JVM-not-found error** topic describes what your options are.

Go to Step 2 if you are installing for a System i system.

Go to Step 3 for all installations other than System i.

2. (System i installation) The installation wizard displays a sign-on panel that asks you to provide the name of the System i system to which you are installing the DS CLI application. You must provide the IP address or the DNS name of the i5/OS server. In addition, you must also supply the user name and password that is used to access the designated System i system. Click **OK**. The Welcome window is displayed.

The Welcome window contains a message that encourages you to read the readme file before you continue with the installation. The readme file is located in the `cliReames/` directory of the installation CD.

Proceed to Step 3.

3. Click **Next** on the Welcome window to continue or **Cancel** to exit the installation. When you click **Next** the License agreement window is displayed. The Welcome window contains a message that encourages you to read the readme file before you continue with the installation. The readme file is located in the `cliReames/` directory of the installation CD.
4. Select **I accept the terms of this license agreement** and click **Next** to continue. Select **I do not accept the terms of this license agreement** and **Cancel** to exit the installation.

When you accept the agreement and click Next, the Target System window is displayed.

5. Select the target system (Windows or Novell Netware) where you want the DS CLI installed, and then click **Next** to continue or **Cancel** to exit the installation. Select Windows as your target system for all systems except Novell Netware.

When you select Novell Netware and click next, the Novell Location window is displayed. Go to Step 7 on page 15 to continue the installation.

When you select Windows and click Next, the Installation location window is displayed.

6. Verify that the directory name that is shown in the Installation location window is the directory where you want to install the DS CLI application. If it is not the correct directory, enter the directory path in the input field (do not use blank spaces in the installation path). Click **Next** to continue the installation. Click **Cancel** if you want to exit the installation.

When you click **Next** to continue the installation, the Installation preview window is displayed. Go to Step 9 to continue the installation process.

Note: If you are installing onto a System i system, a window that asks for the directory where Java is installed on the i5/OS is displayed when you click **Next**. Go to Step 8 to continue the installation process.

7. (Novell Netware installation) Complete the information on the Novell location window. You are asked to supply the location where the Windows drive is installed and where the JAVA HOME directory that contains the version of Java you want to use is located. Click **Next** to continue the installation. Click **Cancel** if you want to exit the installation.

When you click **Next** to continue the installation, the Installation preview window is displayed. Go to Step 9 to continue the installation process.

8. (OS400 installation) The Java directory window for the System i system opens. Insert the directory information. Click **Next** to continue or **Cancel** to exit the installation.

When you click **Next** to continue the installation, the Installation preview window is displayed. Go to Step 9 to continue the installation process.

9. (Installation preview window) Verify that the displayed information is accurate. This window provides the location where the command-line interface will be installed and specifies how much space it will occupy on your drive. Click **Next** to continue or **Cancel** to exit the installation. You can change the installation directory by clicking the **Back** button.

When you click **Next** to continue the installation process, the Installation progress window is displayed.

10. (Installation progress window) This window provides the progress bar that reflects the percentage of installation that is completed as the files are installed. After the installation is complete, click **Next** to continue or **Cancel** to exit the installation.

When you click **Next** to continue the installation process, the Installation summary window is displayed.

11. (Installation summary window) This window provides confirmation that the installation of the DS CLI application was successful. Click **Next** to continue or **Cancel** to exit the installation.

When you click **Next** to continue the installation process, the Installation complete window is displayed.

12. (Installation complete window) This window provides you the opportunity to read the README file. Click **Finish** to complete the installation.

Notes:

1. You can verify that the command-line interface has installed correctly for Windows by reviewing the CLI.CFG file in the lib/ directory.
2. The DS CLI application is installed in the following two places in i5/OS:
 - IFS directory *IBM/DS_CLI*. This directory contains the profiles, .EXE files, Java .JAR files, readme files, and so forth.
 - The QDSCLI library. This library contains executable code.
3. Before you can invoke the DS CLI application from the i5/OS, you must add the QDSCLI library to the i5/OS library list.

4. You can check the following directories to verify that the DS CLI application has been installed for your operating system

AIX /opt/ibm/dscli

HPUX /opt/ibm/dscli

Linux /opt/ibm/dscli

Sun Solaris
/opt/ibm/dscli

Windows
C:\Program Files\IBM\dscli

HP Tru64
/opt/ibm/dscli

iSeries
/ibm/dscli

Novell Netware
SYS:\dscli

Installing the DS CLI using the console mode

Complete this task to install the DS CLI application on your system using the console mode. The console mode is primarily used for installations on a Linux operating system or on a UNIX operating system without an X display. Users can run the installer from a command prompt on a Windows operating system.

Consider the following before you perform the installation of the DS CLI application:

- You cannot install the DS CLI on a computer that contains the ESS CLI.
- You cannot install the DS CLI on a Windows 64-bit operating system.
- You must have a version of Java 1.4.1 or higher that is installed on your system in a standard directory. The DS CLI installer checks the standard directories to determine if a version of Java 1.4.1 or higher exists on your system. If this version is not found in the standard directories, the installation fails. If the installation fails because the correct version of Java is not found, see the installation topic *Correcting the JVM-not-found error*.

The DS CLI installation CD contains the Java 1.4.2 version. You can install this version from the CD and continue with the installation of the DS CLI application.

- If the DS CLI application was installed on your client or host machine in the past, ensure that you end any active sessions of the DS CLI before you run the DS CLI installation CD.
- If you are installing onto a Novell system, you are directed to provide the following information:
 - The directory where your Windows drive is mapped
 - The location of the JAVA_HOME environment variable. The JAVA_HOME environment variable is where the Java runtime environment file is installed. The DS CLI application requires the appropriate java runtime environment location to use during the installation process.
- If you are installing the DS CLI onto an OS/400 system, ensure that the machine that you are installing from is network-attached to the OS/400 machine.

- During the installation of the DS CLI application onto an OS/400 system, you must provide the following information:
 - The name of the OS/400 machine to which you are installing the DS CLI application.
 - The user name and password that is used to access the designated OS/400 machine.

The console mode is primarily used for installations on a Linux operating system or on a UNIX operating system that does not have an X display. Users can run the installer from a command prompt on a Windows operating system. The console mode installer displays its various screens as text.

Before you can use the DS CLI, some operating systems require that you restart your system after the installation is complete. Or, you might be required to open a new command prompt window to start a DS CLI session.

Perform the following steps to install the DS CLI using the console mode:

1. Insert the DS CLI installation CD into the CD drive. If the installation starts, click the **Exit** selection to exit.
2. Open a command prompt and locate the `setupwin32console.exe` or the `setuplinux.bin` file on the DS CLI CD.
3. Enter the following command on the command line (unless you are installing onto an OS/400 system): `setup platform<.exe | .bin | .sh> -console`. The Welcome screen is displayed.

For example, for Windows, enter: `setupwin32console.exe` or, for Linux, enter: `setuplinux.bin -console`

For an installation onto an OS/400 system from a Windows operating system, enter: `setupwin32console.exe -os400`

Notes:

- a. When you issue the `setupwin32console.exe` command on a Windows operating system, you do not need to include the **-console** parameter as part of your command.
- b. Initially the DS CLI installer checks your standard directories for the correct version of Java. If the correct version of Java is not found, you receive the following message:

A suitable JVM could not be found. Please run the program again using the option `-is:javahome <JAVA HOME DIR>`

If the installation fails because the correct version of Java is not found, see the installation topic *Correcting the JVM-not-found error*.


```

Initializing InstallShield Wizard...
Searching for Java(tm) Virtual Machine...
.
Searching for Java 1.4.1 by IBM Corporation
Verifying Java 1.4.1 by IBM Corporation
.....
-----
Welcome to the InstallShield Wizard for IBM System Storage DS Command-Line
Interface (CLI)
The InstallShield Wizard installs IBM System Storage DS Command-Line Interface
on your computer.

To continue, choose Next.


DS Command-Line Interface
IBM Corporation

Users are encouraged to read the User's Guide PDF and the README file before
installing. Both files are located in the cliReadmes/ directory of this
CD-ROM.

Press 1 for Next, 3 to Cancel or 4 to Redisplay [1]

```

4. Press 1 for Next. The License agreement screen is displayed. You can also press 3 to Cancel, or 4 to Redisplay.

```

Please read the following license agreement carefully.

Use of the IBM System Storage DS Command-Line Interface (CLI) is governed by the
IBM Agreement for Licensed Internal Code, a copy of which has been provided
with your DS Machine.

(C) Copyright 2004, 2005 International Business Machines
Corporation All rights reserved.

Please choose from the following options:

[ ] 1 - I accept the terms of the license agreement.
[ ] 2 - I do not accept the terms of the license agreement.

To select an item enter its number, or 0 when you are finished: [0] 1

[X] 1 - I accept the terms of the license agreement.
[ ] 2 - I do not accept the terms of the license agreement.

To select an item enter its number, or 0 when you are finished: [0] 1

Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]

```

5. Press 1 to accept the terms of the license agreement. A confirmation prompt is returned with an "X" next to the acceptance line and a 0 in the finished line.
 - a. Press Enter to notify the installer that you are finished with this section. The next action line of instructions is displayed.
 - b. Press 1 for Next. One of the following results occurs depending on the system that you are using to install the DS CLI:
 - The Windows User's screen is displayed if you are installing on a Windows operating system or are pointing to a Novell system. Continue with step 6 on page 19.

- The Install Location screen is displayed if you are installing on a Linux operating system. Continue with Step 10 on page 20.

You can also press 3 to Cancel, or 4 to Redisplay.

Please select the appropriate target system:

```
[X] 1 - Windows
[ ] 2 - Novell Netware
```

To select an item enter its number, or 0 when you are finished: [0]

Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]

6. If you want the Windows operating system, press 1. If you want the Novell operating system, press 2. If you choose 1 or 2, a confirmation prompt is returned with an "X" next to the system that you choose and with a 0 in the finished line.

- Press Enter to notify the installer that you are finished with this section.
- Press 1 to continue. The Install Location screen is displayed. This screen can be different depending whether you choose Windows, Novell, or are installing for an OS/400.
 - Continue to Step 7 if you choose Windows.
 - Continue to Step 8 if you choose Novell.
 - Continue to Step 9 on page 20 if you are installing for an OS/400.

You can also press 2 to go to the previous screen, 3 to Cancel, or 4 to Redisplay.

7. (Windows and Linux only) Observe the default directory path that is displayed in the Install Location screen and take the following action (example: the Install Location screen at the end of this step):

- Press 1 to continue if you are satisfied with the default directory.
- Change the directory path where you want to install the CLI (do not use blank spaces in the path) if you are not satisfied, and press 1 to continue.
- Go to Step 10 on page 20 after pressing 1.

The Install Location screen is displayed after pressing 1.

You can also press 2 to go to the previous screen, 3 to Cancel, or 4 to Redisplay.

IBM System Storage DS Command-Line Interface Install Location

Please specify a directory or press Enter to accept the default directory.

Directory Name: [C:\Program Files\ibm\dsccli] or [opt/ibm/dsccli]

Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]

8. (Novell only) Observe the default directory paths that are displayed in the Installation Location screen for Novell and perform the following action (example: the Install Location screen at the end of this step):

Notes:

- a. SYS represents where the Windows drive is mapped in a Novell system. However, this can also be SYS:\DS\CLI or a volume other than SYS:
- b. J: (can be any drive letter)
- a. Press 1 to continue if you are satisfied with the default values.
- b. Enter the applicable value if you are not satisfied with the default, and press 1 to continue.
- c. Go to Step 10 after you press 1.

The Install Location screen is displayed after you press 1.

You can also press 2 to go to the previous screen, 3 to Cancel, or 4 to Redisplay.

```
IBM System Storage DS Command-Line Interface Install Location

Please indicate the Novell location (volume:\directory) where this window J:
drive is mapped:

Enter a value: [SYS:]

Please indicate the JAVA HOME location on Novell: (JVM 1.4.1 or above is
required)

Enter a value: [SYS:\JAVA]

Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]
```

9. (Windows and OS/400 only) Record the default directory path that is displayed in the Install Location screen for OS/400 and perform the following action (example: the Install Location screen shown at the end of this step):
 - a. Press 1 to continue if you are satisfied with the default value.
 - b. Enter the applicable value if you are not satisfied with the default, and press 1 to continue.
 - c. Go to Step 10 after you press 1.

The Install Location screen is displayed after you press 1.

You can also press 2 to go to the previous screen, 3 to Cancel, or 4 to Redisplay.

```
Please indicate the directory where Java is installed on the OS/400

Enter a value: [/QOpenSys]

Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]
```

10. Verify that the installation directory shown on the Install Location screen is the one you want the DS CLI application installed in. Press 1 to continue. The Installation Progress screen is displayed.

Note: Depending on the current configuration of your system, the total size of the installation can vary.

You can also press 2 to go to the previous screen, 3 to Cancel, or 4 to Redisplay.

IBM System Storage DS Command-Line Interface will be installed in the following location:

C:\Program Files\ibm\dscli

for a total size:

16.6 MB

Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]

11. Observe the installation progress and wait until the DS CLI installation is completed before you press 1. Press 1 after the installation completes (there is no reminder to press 1 when the installation is completed). The Install Completed screen is displayed after you press 1.

Installing command-line Interface. Please wait...

Installing IBM System Storage DS Command-Line Interface. Please wait...

|-----|-----|-----|-----|
0% 25% 50% 75% 100%
||||||||||||||||||||||||||||||||||||||||

|-----|-----|-----|-----|
0% 25% 50% 75% 100%
||||||||||||||||||||||||||||||||||||||||

Creating uninstaller...

12. Press 1 to continue if you are satisfied with the installation. The Readme screen is displayed (not shown).
You can also press 3 to Cancel, or 4 to Redisplay.

The InstallShield Wizard has successfully installed IBM System Storage DS Command-Line Interface. Choose Next to continue the wizard.

Press 1 for Next, 3 to Cancel or 4 to Redisplay [1]

13. Press Enter to read the readme information or press 3 to finish the installation process. If you press Enter, you must press q to quit the readme file and then press 3 to finish the installation process. The Readme screen contains specific information about the DS CLI for your operating system.

Note: If you are installing on a Windows operating system, you might have to restart your system. If this is the case, the following screen is displayed and you must complete the next step.

To complete the installation you must restart your computer.

[X] 1 - Yes, restart my computer.

[] 2 - No, I will restart my computer at a later time.

To select an item enter its number, or 0 when you are finished:

14. Select the restart computer item that you want and press 3 to finish the installation process. Use of the DS CLI application becomes effective with a reboot of your system.

You can verify that the command-line interface has installed correctly by reviewing the CLI.CFG file in the lib subdirectory of the install directory that you defined in Step 6.

Installing the DS CLI using the unattended (silent) mode

Complete this task to install the DS CLI application using the unattended (silent) mode.

Consider the following before you perform the installation of the DS CLI application:

- You cannot install the DS CLI on a computer that contains the ESS CLI.
- You cannot install the DS CLI on a Windows 64-bit operating system.
- You must have a version of Java 1.4.1 or higher that is installed on your system in a standard directory. The DS CLI installer checks the standard directories to determine if a version of Java 1.4.1 or higher exists on your system. If this version is not found in the standard directories, the installation fails. If the installation fails because the correct version of Java is not found, see the installation topic *Correcting the JVM-not-found error*.

The DS CLI installation CD contains the Java 1.4.2 version. You can install this version from the CD and continue with the installation of the DS CLI application.

- If the DS CLI application was installed on your client or host machine in the past, ensure that you end any active sessions of the DS CLI before you run the DS CLI installation CD.
- If you are installing onto a Novell system, you are asked to provide the following information:
 - The directory where your Windows drive is mapped
 - The location of the JAVA_HOME environment variable. The JAVA_HOME environment variable is where the Java runtime environment file is installed. The DS CLI application requires the appropriate java runtime environment location to use during the installation process.
- System i and i5/OS installations have the following requirements:
 - The latest Java group program temporary fixes (PTF)
 - i5/OS 5722-SS1 option 34 - Digital certificate manager
 - Licensed product 5722-AC3 option *base - Crypto Access Provider 128 bit
 - Licensed product 5722-DG1option *base - IBM HTTP Server for iSeries
 - Licensed product 5722-JV1 options 6 - Java Developer Kit 1.4
 - The latest cumulative PTF package installed on the i5/OS

- The machine that you are installing from must be connected to the i5/OS through an IP connection.

The unattended (silent) mode of installation allows you to perform the installation from the command line without prompts or feedback. You can create an options/response file and use a text editor to change the default selections to a selection of your choice.

Before you can use the DS CLI, some operating systems require that you restart your system after the installation is complete. Or, you might be required to open a new command prompt window to start a DS CLI session.

Note: After you install the new version of DS CLI, your old DS CLI sessions might be unusable.

Perform the following steps to install the DS CLI application using the unattended (silent) mode:

1. Log on to your system as an administrator.
2. Insert the DS CLI installation CD into the CD drive. If the installation wizard starts, click the **Exit** selection to exit.
3. Enter the following command for all systems except the System i system at the command prompt `setup<platform>.<exe|bin|sh> -silent`. Press the **Enter** key on your keyboard to start the installation process in unattended (silent) mode.

The silent installation process applies all the default options to your installation. If you want to modify the default options, go to Step 4.

Note: Initially the DS CLI installer checks your standard directories for the correct version of Java. If the correct version of Java is not found, you receive the following message:

A suitable JVM could not be found. Please run the program again using the option `-is:javahome <JAVA HOME DIR>`

The manner in which you respond to this message depends on your operating system and your installation environment settings. **Correcting the JVM-not-found error** topic describes your options.

4. Generate the template response file if you must modify the defaults. Two example response files are provided in the cliReadmes directory of the CD: one file for Windows, Novell, and iSeries installations, and one file for all UNIX and Linux installations. You can copy the applicable response file to a directory of your choice.

The following output is an example of the Windows, Novell, or iSeries response or options file.

Options File Template

```
#
# Wizard name: Install
# Wizard source: setup.jar
# Created on: Mon May 09 16:35:04 MST 2005
# Created by: InstallShield Options File Generator
#
# This file can be used to create an options file (i.e., response file) for the
# wizard "Install". Options files are used with "-options" on the command-line
# to modify wizard settings.
#
# The settings that can be specified for the wizard are listed below. To use
# this template, follow these steps:
#
# 1. Enable a setting below by removing leading '###' characters from the
# line (search for '###' to find settings you can change).
#
# 2. Specify a value for a setting by replacing the characters '<value>'.
# Read each setting's documentation for information on how to specify its
# value.
#
# 3. Save the changes to the file.
#
# 4. To use the options file with the wizard, specify -options <file name>
# as a command-line argument to the wizard, where <file name> is the name
# of this options file.
#
#####

#####
#
# License Agreement State
#
# The initial state of the License Agreement panel. Legal values are:
#
# 0 - Nothing will be selected
# 1 - "I accept the terms of the license agreement." will be selected
# 2 - "I do not accept the terms of the license agreement." will be
#    selected
#
# For example, to configure the panel to initially display "I accept the
# terms of the license agreement.", use
#
# -W license.selection=2
#
# -W license.selection=1
#
#####

# User Input Field - Win_Novell_select
#
# This field only has meaning if you are running the installer on Windows.
# You must choose whether it should install the Windows CLI or the Novell
# CLI.
#
# If you choose Novell, then make sure that the installLocation (see below)
# is on a Novell drive.
#
# 1 - Novell Netware
# 2 - Windows
#
# -W win_user_input.Win_Novell_select="2"
#
#####
```

```

IBM System Storage DS command-line Interface Install Location
#
# The install location of the product. Specify a valid directory into which the
# product should be installed. If the directory contains spaces, enclose it in
# double-quotes. For example, to install the product to C:\Program Files\My
# Product, use
#
### -P installLocation="C:\Program Files\My Product"
#
-P installLocation="C:\Program Files\IBM\dscli"

#####
#
# User Input Field - os400_java_location
#
#
# This is only used on i5/OS iSeries system installations.
#
#
### -W os400_java_location_panel.os400_java_location="<value>"
#
#####
#
# User Input Field - novell_location_mapped
#
# This is only used on Novell installations.
#
### -W novell_user_input.novell_location_mapped="<value>"
#
#####
#
# User Input Field - novel_java_location
#
# This is only used on Novell installations.
#
### -W novell_user_input.novel_java_location="<value>"
#
#####

```

5. Save the modifications to the response file.
6. Enter the following command for all systems (including UNIX and Linux) except the i5/OS iSeries system at the command prompt *setup<platform>*. *<exe | bin | sh> -silent -options options.txt* and press the **Enter** key on your keyboard to start the installation process in unattended (silent) mode.
7. Enter the following command if you are installing the DS CLI onto an i5/OS iSeries system *setup<platform>*. *<exe | bin | sh> -os400 -silent -options options.txt* and press the **Enter** key on your keyboard to start the installation process in unattended (silent) mode.

Notes:

1. You can verify that the command-line interface has installed correctly for Windows by reviewing the CLI.CFG file in the lib/ directory.
2. The DS CLI application is installed in the following two places in i5/OS:
 - IFS directory *IBM/DS_CLI*. This directory contains the profiles, .EXE files, Java .JAR files, readme files, and so forth.
 - The QDSCLI library. This library contains executable code.
3. Before you can invoke the DS CLI application from the i5/OS, you must add the QDSCLI library to the i5/OS library list.
4. You can check the following directories to verify that the DS CLI application has been installed for your operating system

AIX	/opt/ibm/dscli
HPUX	/opt/ibm/dscli
Linux	/opt/ibm/dscli
Sun Solaris	/opt/ibm/dscli
Windows	C:\Program Files\IBM\dscli
HP Tru64	/opt/ibm/dscli
iSeries	/ibm/dscli
Novell Netware	SYS:\dscli

Correcting the JVM-not-found error

Complete this task to correct the JVM-not-found error.

The JVM-not-found error occurs when the DS CLI installer cannot find the correct version of Java in the standard directories of your system. You must have Java 1.4.1 or higher on your system for the DS CLI application to work.

Notes:

1. This error might also occur if you are installing the DS CLI on an AIX system. The LIBPATH environment variable can interfere with the installation of the DS CLI and can result in the display of the JVM-not-found error. To prevent this error, disable the LIBPATH environment variable before you install the DS CLI. After the installation of the DS CLI, enable the LIBPATH environment variable so that it can be used with other applications.
2. If you have already installed the DS StorageManager, you have installed Java 1.4.2 on your system. However, because it was not installed in one of your standard directories, the DS CLI installer did not find it during its initial check.

If Java 1.4.1 or higher is not found during the initial check, the following message is displayed:

```
A suitable JVM could not be found. Please
run the program again using the option -is:javahome <JAVA HOME DIR>
```

Perform either step 1 or step 2 of the following steps to correct the JVM-not-found error (see Step 4 on page 27 and 5 for AIX):

1. (Optional) Run the DS CLI installer again, and provide the path to the JVM. The following examples represent directories where you can find the correct version of Java:

For a Windows system, specify the following:

```
setupwin32 -is:javahome
"C:\Program Files\IBM\dsniserver\java\jre"
```

Note: Because there is a space in the Program Files directory name, you are required to add quotes around the directory name.

For a Linux system, specify the following:

```
setuplinux.bin -is:javahome  
/opt/ibm-Java-whatever/java/bin
```

Note: If you use this argument, the installer attempts to use whatever JVM that you specify, even if it is an unsupported version.

Go directly to step 4 after this step completes.

2. (Optional) Open the DS CLI installation CD and install the Java 1.4.2 version into one of your standard directories.
3. Continue with the installation of the DS CLI application.
4. (AIX only) Run the following commands to sequentially disable the LIBPATH environment variable, install the DS CLI, and restore the LIBPATH environment variable:

```
export LIBSAVE=$LIBPATH  
unset LIBPATH  
setupaix.bin -is:javahome /opt/ibm-Java-whatever/java/bin  
export LIBPATH=$LIBSAVE  
unset LIBSAVE
```

5. (AIX only) Continue with the installation of the DS CLI application.

Installing DS CLI on an OpenVMS system

The DS Command-Line Interface (CLI) provides a full function command set that allows you to check your storage unit configuration and perform specific application functions when necessary. It also enables open systems hosts to invoke and manage FlashCopy, Metro, and Global Mirror functions through batch processes and scripts.

This topic describes how to install the DS CLI on an OpenVMS system. Additionally, it provides hints for integrating the DS CLI into the operating system environment.

Preparing to install the DS CLI on an OpenVMS System

The IBM System Storage DS CLI program enables open systems hosts to invoke and manage FlashCopy and Metro and Global Mirror functions through batch processes and scripts. The DS CLI is installed on an OpenVMS system by using the Polycenter Software Installation utility.

Be aware of the following requirements before you begin the installation of the DS CLI:

- The installation process places all command-line interface files in the [IBMDSCLI...] directory tree as a subdirectory of the Polycenter destination directory. You can specify this directory by using the **PRODUCT INSTALL** command with the /DESTINATION=device:directoryname] qualifier. If you omit the device name, the Polycenter installation utility uses your current default device. If you omit the directory name, the Polycenter Software Installation utility uses the [VMS\$COMMON] directory as the default destination directory.

If you do not use the /DESTINATION qualifier at all, the utility installs the software in the location that is defined by logical name **PCSI\$DESTINATION**. If this logical name is not defined, the utility installs the software in **SYS\$SYSDEVICE:[VMS\$COMMON]**.

- Extract and check the Release Notes file from the DS CLI installation package in the root directory of the installation CD.

- Ensure that you have at least 140000 blocks (approximately 70 MB) of free space on the installation disk.
- Install the required prerequisite patches operating system patches (ECOs) on your OpenVMS host system.

The command-line interface installation process automatically installs Java™ Runtime Environment (JRE) 1.4.2-4 on your host system. The JRE requires several ECOs. For detailed patch information, see the Java SDK v1.4.2 patch installation page at:

http://h18012.www1.hp.com/java/download/ovms/1.4.2/sdk1.4.2_patches.html

To download these ECOs, use the HP IT Resource Center (ITRC) database to perform a search for the patches from which you can select. These download steps are described at the Java SDK v1.4.2 patch installation page.

Installing the DS CLI on your OpenVMS system

Use the following steps to install the DS CLI application in your OpenVMS environment.

Before you install the DS CLI application, verify that the prerequisite software and hardware are installed on your system. The installation program checks for prerequisites and stops if any prerequisites are missing.

1. Log on to your host system as a user with SYSLOCK, SYSNAM, SYSPRV, (or a system UIC), TMPMBX, and CMKRNL privileges.
2. Insert the DS CLI product CD-ROM into the CD drive.
3. Mount the CD drive. For example, for an IDE CD device DQA0, type the following command: **MOUNT /NOASSIST /OVERRIDE=IDENTIFICATION /MEDIA_FORMAT=CDROM DQA0:** A message similar to the following is displayed.

```
%MOUNT-I-WRITELOCK,volume is write locked
%MOUNT-I-CDROM_ISO, : (1 of 1) , mounted on VMS1$DQA0:
```

For a SCSI CD device DKA *nnn*, type the following command: **MOUNT /NOASSIST /OVERRIDE=IDENTIFICATION /MEDIA_FORMAT=CDROM DKA_{nnn}:** where *nnn* represents the number that is assigned by the OpenVMS system to your CD device.

4. Type the following command: **DIRECTORY/FULL DQA0:[000000]IBM-AXPVMS-DSCLI-*.PCSI** and press **Enter** to access the command-line interface installation package in the root directory of the CD. Output similar to the following is displayed.

Directory DQA0:[000000]

```
IBM-AXPVMS-DSCLI-V0500-01F96-1.PCSI;1   File ID:  (4,7,0)
Size:      55.79MB/55.80MB      Owner:    [0,0]
Created:    9-MAR-2005 04:07:22.25
Revised:    9-MAR-2005 04:09:43.98 (1)
Expires:    None specified
Backup:     No Backup record
Effective:   None specified
Recording:   None specified
Accessed:    None specified
Attributes:  None specified
Modified:    None specified
Linkcount:  1
File organization: Sequential
Shelved state: Online
Caching attribute: Writethrough
File attributes: Allocation: 114282, Extend: 0, Global buffer count: 0
                  Version limit: 0, Backups disabled
Record format: Undefined, maximum 0 bytes, longest 0 bytes
Record attributes: None
RMS attributes: None
Journaling enabled: None
File protection: System:RWED, Owner:RWED, Group:RWED, World:RWED
Access Cntrl List: None
Client attributes: None
```

Total of 1 file, 55.79MB/55.80MB

5. Type the following command and press Enter to extract the command-line interface for OpenVMS release notes: **PRODUCT EXTRACT RELEASE_NOTES DSCLI /SOURCE=DQA:[000000] /FILE=filespec**

Note: If you do not use the **/FILE** qualifier, the release notes are written to the DEFAULT.PCSI\$RELEASE_NOTES file in your current default directory. Read the release notes before continuing to ensure that you are equipped with the information that you need to complete your installation successfully.

6. Type the following command and press Enter to invoke the command-line interface installation process: **PRODUCT INSTALL DSCLI /SOURCE=DQA0:[000000] /DESTINATION=devicename:[directoryname] /RECOVERY_MODE**. A message similar to the following is displayed.

The following product has been selected:

IBM AXPVMS DSCLI V5.0-1F96 Layered Product

Do you want to continue? [YES]

The **/DESTINATION** qualifier can be omitted from the command. However, IBM recommends that you use the optional **/RECOVERY_MODE** qualifier. For a detailed description of all **PRODUCT INSTALL** command qualifiers and parameters, see the HP OpenVMS System Management Utilities Reference Manual or the OpenVMS online help.

7. Press Enter to continue the installation process. The following message is displayed.

Configuration phase starting ...

You will be asked to choose options, if any, for each selected product and for any products that may be installed to satisfy software dependency requirements.

IBM AXPVMS DSCLI V5.0-1F96: IBM DS Command Line Interface (DS CLI)

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International Business Machines Corporation (IBM)

No PAK

Do you want the defaults for all options? []

8. Type No and press Enter to review the installation options.

Note: You can type Yes if you have decided to install with the default options.

The following CLI license message is displayed after typing Yes or No.

License Agreement IBM System Storage DS Command-line Interface

Copyright 2005 International Business Machines Corporation
All rights reserved.

Use of the IBM System Storage DS Command-line Interface (DS CLI) is governed by the IBM Agreement for Licensed Internal Code, a copy of which has been provided with your DS Machine.

Answer "Yes" to install the DS CLI code. By installing this code, you are certifying that you have read and accept the IBM DS CLI license agreement.

Answer "No" to terminate and exit the IBM DS CLI installation.

Do you want to continue? [YES]

9. Press Enter to accept the DS CLI license agreement. The following Java license message is displayed.

License Agreement HP Java Run-Time Environment for OpenVMS

The IBM DS CLI requires the Java 1.4.2 Java Runtime Environment (JRE). Installing the DS CLI program automatically installs the required JRE. The installed JRE is the intellectual property of and licensed by Hewlett-Packard Company.

You can view the license agreement on the World Wide Web at:

http://h18012.www1.hp.com/java/download/ovms/1.4.2/rte1.4.2_license.html

Answer "Yes" to install the Java code. By installing this code, you are certifying that you have read and accepted the HP Java license agreement.

Answer "No" to terminate and exit the IBM DS CLI installation.

Do you want to continue? [YES]

10. Press Enter to accept the Java license agreement. The command-line interface requires Java 1.4.2 on an OpenVMS Alpha host system. If you answer No, the installation process automatically ends and exits. The following library update warning message is displayed.

WARNING: By default the system Help and Message libraries will be updated.

The IBM DS CLI program provides local Help and Help Message library files. By default, the CLI installation integrates these local libraries into the OpenVMS system Help and Help Message libraries.

To prevent the system libraries from being modified chose to review the installation options and answer "No" when prompted to update the libraries.

Do you want to continue? [YES]

11. Press Enter to continue the installation process. The following configuration question is displayed.

Would you like the local IBM DS CLI Help and Help Message libraries to be integrated into the OpenVMS system libraries?

If you answer "Yes", the following OpenVMS libraries will be updated:

```
SYS$COMMON:[SYSHLP]HELPLIB.HLB
SYS$COMMON:[SYSHLP]MSGHLP$LIBRARY.MSGHLP$DATA
```

If you answer "No", OpenVMS system libraries will not be modified.

In every case, local libraries are available under:

```
IBMDCLI$HELP:IBMDCLI_OVR.HLB
IBMDCLI$HELP:IBMDCLI_MESSAGES.MSGHLP$DATA
```

Modify the system Help and Help Message libraries? [YES]

12. Press Enter to confirm the library update option (or type No and press Enter to deny the library update option). The following confirmation message is displayed:

Do you want to review the options? [NO]

13. Press Enter to confirm and accept all selections. The following installation message with completion status is displayed.

Execution phase starting ...

The following product will be installed to destination:

```
IBM AXPVMS DSCLI V5.0-1F96
DISK$V732_ALPHA:[VMS$COMMON.]
```

Portion done: 0%...10%...20%...30%...60%...70%...80%...90%...100%

The following product has been installed:

```
IBM AXPVMS DSCLI V5.0-1F96          Layered Product
```

14. Review the Installation Verification Procedure (IVP) report, which is similar to the following output, and check for possible errors.

```
%PCSI-I-IVPEXECUTE, executing test procedure for IBM AXPVMS DSCLI
V5.0-1F96 ...
dscli -ver
IBM DSCLI Version: 5.0.1.96
%PCSI-I-IVPSUCCESS, test procedure completed successfully
```

15. Ensure that the installation completes. When the Polycenter Software Installation utility finishes the command-line interface installation process, a message similar to the following is displayed.

```
IBM AXPVMS DSCLI V5.0-1F96: IBM DS Command Line Interface (DS CLI)

Insert the following lines in SYS$MANAGER:SYSTARTUP_VMS.COM:
@PCSI$DESTINATION:[IBMDCLI.MGR]IBMDCLI$STARTUP.COM
Insert the following lines in SYS$MANAGER:SYSHUTDOWN.COM:
@IBMDCLI$MANAGER:IBMDCLI$SHUTDOWN.COM

Users of this product require the following lines in their login
command procedure:
@IBMDCLI$MANAGER:IBMDCLI$LOGIN.COM

Release notes for IBM DS CLI available in IBMDCLI$HELP
```

16. Unmount the CD drive and remove the CD-ROM.

The command-line interface provides program startup, login, and shutdown procedures in the [destinationdir.IBMDCLI.MGR] directory. The installation process runs the startup and login procedures immediately before invoking the IVP procedure. But for persistent setup, you must integrate the startup, login, and shutdown procedures.

Using the DS CLI on an OpenVMS system

To use the DS CLI on an OpenVMS system, you must integrate the required IBMDCLI\$STARTUP.COM and IBMDCLI\$LOGIN.COM procedures. You can also integrate the optional IBMDCLI\$SHUTDOWN.COM procedure. This integration is accomplished when you use the OpenVMS persistent setup procedure.

You must add the required IBMDCLI\$STARTUP.COM procedure to your system startup processes. The IBMDCLI\$STARTUP.COM procedure defines the logical names that are required for the command-line interface in your system logical name table and installs some images with enhanced privileges. This procedure is intended to be invoked during the system startup.

You also must add the required IBMDCLI\$LOGIN.COM procedure to your system login processes. The IBMDCLI\$LOGIN.COM procedure sets up the JRE that is required by the command-line interface and defines the DSCLI command as a foreign DCL command symbol. It is intended to be invoked during the system-wide SYS\$MANAGER:SYLOGIN.COM or user-specific SYS\$LOGIN:LOGIN.COM procedure.

In order to use the DS CLI interface from start to finish in your OpenVMS system, you can add the optional IBMDCLI\$SHUTDOWN.COM procedure to your system shutdown processes. The IBMDCLI\$SHUTDOWN.COM procedure performs the

removal operations for privileged images and undefines system-wide logical names that are associated with the DS CLI. It is intended to be invoked during the system shutdown process.

1. Integrate the IBMDSCLI\$STARTUP.COM procedure into your system startup by adding the following line to the SYS\$MANAGER:SYSTARTUP_VMS.COM script: `$ @destinationdev:[destinationdir.IBMDSCLI.MGR] IBMDSCLI$STARTUP`

destinationdev

Specifies the name of the device that contains the command-line interface installation directory

destinationdir

Specifies the name of the directory where you just installed the command-line interface.

Note: You can alternatively add the IBMDSCLI\$STARTUP.COM procedure to the SYSMAN startup database.

2. Integrate the IBMDSCLI\$LOGIN.COM procedure into the system-wide or user-specific login by adding the following line:
`$@IBMDSCLI$MANAGER:IBMDSCLI$LOGIN.COM`

Note: Run the IBMDSCLI\$LOGIN.COM procedure only after you have successfully run the IBMDSCLI\$STARTUP.COM procedure.

3. Integrate the IBMDSCLI\$SHUTDOWN.COM procedure by adding the following line to the SYS\$MANAGER:SYSHUTDOWN.COM script:
`$@IBMDSCLI$MANAGER:IBMDSCLI$SHUTDOWN`

Note: This step is optional. However, processing this step allows your system to make the full use of the DS CLI application.

Chapter 6. Completing DS CLI postinstallation

Complete these tasks to set up the DS CLI application so that you can use the DS CLI to configure your DS6000.

You must install the DS CLI before you complete these postinstallation tasks.

After you install the DS CLI application, how do you log into the application? After the initial login, what are some of the first tasks that you must accomplish before you can get the full benefit of the DS CLI application? The instructions in this section answer these questions, as well as, describe how to configure your volumes and how to manage potential problems.

Before you can use the DS CLI application with the i5/OS (particularly if you are using external load source), you must set up the initial configuration of your DS6000 models. After the initial configuration, you can do a D-mode IPL and begin using the DS CLI application directly from the i5/OS. In the meantime, you can follow the list below as a guide for your initial configuration.

1. Initiate the DS CLI to begin using it in either single-shot, script, or interactive command mode.
2. Set up your required user accounts and passwords.
3. Set your DS CLI default configuration settings.
4. Activate your licensed functions. This includes obtaining your feature activation codes and applying the feature activation codes to your storage unit.
5. Enable the remote support and call home functions. You must provide customer contact and network information to enable these functions.
6. Register for the My Support service.
7. Configure new fixed block storage. Use the DS CLI to create and modify fixed block extent pools, arrays, ranks, volumes, and volume groups. You can also configure host ports and connections.

Using the DS CLI application

You must ensure that you have installed the DS Storage Manager using the full-management console installation and that you have configured your domain. Without this domain configuration (which is a one-time process), you cannot use the DS CLI. After you install the DS CLI, three command modes are available to you.

You must log into DS CLI to use the command modes. There are three command modes for the DS CLI:

- Single-shot
- Interactive
- Script

Note:

- DS CLI logs are created on the system running the DS CLI application. By default, the location of the logs is under the user home directory at dscli/log/. For example, on Windows the logs for the Administrator user

are created under the directory C:\Documents and Settings\Administrator\dscli\log. On UNIX the logs are created under the directory ~/dscli/log.

- You must not start more than 100 DS CLI sessions simultaneously. Starting more than 100 DS CLI sessions simultaneously can result in connection problems.

Logging into the DS CLI application

You must log into the DS CLI application to use any of the command modes.

You must ensure that you are in the directory where you installed the DS CLI application. The following list provides a reminder of the supported operating systems default directories where the DS CLI is installed if the directory designation is not changed:

AIX /opt/ibm/dscli

HPUX /opt/ibm/dscli

Linux /opt/ibm/dscli

Sun Solaris
/opt/ibm/dscli

Windows
C:\Program Files\IBM\dscli

HP Tru64
/opt/ibm/dscli

iSeries
/ibm/dscli

Novell Netware
SYS:\dscli

When you log into the DS CLI application (type `dscli` at the command prompt), you must provide the following information:

HMC1
Specify the primary management console.

User Name
Specify the name of the user account. The default account for the first login is **admin**.

Password
Specify the user password. The default password for the admin account is **admin**. However, this password is only good for your first login.

Note: Because the password for the admin account expires after you log in for the first time, you must change the password before you can perform any other DS CLI command function. Use the **chuser** command to change your password.

The first time that you log in to the DS CLI, you can specify this information using either of the following two methods:

- Ensure you are in the directory where you installed the DS CLI application and type the `dscli` command at the command prompt. Supply all the log in

information with the command. For example: `dscli -hmc1 mtc032h.storage.tucson.ibm.com -user admin -passwd topn0t`.

Use this command when you use the single-shot mode for the first time and when the DS CLI application is not active on your system. In addition, when you use the single-shot mode, you must include the command that you want to process. For example, if you want to process the `lssi` command, if you have not activated the DS CLI application, and if you are using the single-shot mode, type: `dscli -hmc1 mtc032h.storage.tucson.ibm.com -user admin -passwd topn0t lssi`.

- When you log into the DS CLI application (from the directory where you installed the DS CLI application) by typing `dscli`, you are prompted to supply the information for HMC1, user name, and password.

Notes:

1. Entering a DS CLI command at the `dscli` command prompt requires that you continue entering all the parameters and values until the command is complete. This can result in an automatic line wrap if your command has many parameters and values.
2. You cannot force a line break or wrap by hitting the Enter key and then entering the rest of the command on a second line. The DS CLI application interprets the use of the Enter key as an end to the function and begins to process whatever is contained on the line, ignoring the second line.
3. The DS CLI command examples that are provided in this guide are often shown with line wraps that would not occur during your input. These examples are displayed for clarity and other formatting considerations.

Using the DS CLI single-shot command mode

Use the DS CLI single-shot command mode if you want to issue an occasional command but do not want to keep a history of the commands that you have issued.

You must supply the login information and issue the command that you want to process at the same time. Perform the following steps to use the single-shot mode:

1. Use the following command format to enter a DS CLI session (Windows operating system):

```
dscli -hmc1 mtc032h.storage.tucson.ibm.com -user admin -passwd topn0t  
lssi -s -fullid -hdr off
```

Here is an example of this same command in i5/OS without the report delimiters:

```
DSCLI SCRIPT(*NONE) HMC1('9.5.17.156') USER(admin) PASSWORD(itso4a11)  
DSCL(lssi)
```

This command demonstrates the use of the `lssi` command with the `-s` parameter. Use this command to view the storage image IDs for your storage complex. The storage image ID consists of the manufacture name (IBM), the machine type (1750), and the serial number.

Notes:

- a. The command example uses the `-fullid` DS CLI command flag. The `-fullid` command flag generates fully qualified IDs, which include the storage image ID, for every ID that is displayed in the command output.

- b. The command example also uses the **-hdr off** command flag which turns off the header that is generally associated with the report that is generated from the **lssi** command.
 - c. Almost every DS CLI command requires the use of the storage image ID. If you add your target storage ID into your profile file under the *dev* designation, you are not required to provide the storage image ID when you issue a command. However, if you do provide the **-dev** (*storage_image_ID*) parameter, the value that you type takes priority over the value contained in your profile file.
2. Wait for the command to process. The following type of report is generated that lists the storage image IDs that are associated with the storage complex.

IBM.1750-68FA111
IBM.1750-68FA112
IBM.1750-68FA120

Using the DS CLI script command mode

Use the DS CLI script command mode if you want to issue a sequence of DS CLI commands. Administrators can use this mode to create automated processes; for example, establishing remote mirror and copy relationships for volume pairs.

Consider the following when using the DS CLI script command mode:

- The DS CLI script can contain only DS CLI commands. Use of shell commands results in a process failure.
- You can add comments to the scripts. Comments must be prefixed by the number sign (#); for example, # This script contains PPRC Path establish procedures.

Note: It is not the intent of this instruction to tell you how to write a script. An example script is displayed for your use as a guide.

You can issue the DS CLI script from the command prompt at the same time that you provide your login information.

1. Enter the script name at the command prompt using the following format:

```
dscli> -hmc1 mtc032h.storage.tucson.ibm.com -user admin
-passwd password -script ~/bin/mkpprcpairs
```

Note: If you are using i5/OS and have already logged on to the DS CLI application, you invoke the script mode using the following format:

```
DSCLI SCRIPT('/myscript') USER(admin) OUTPUT('/outfile')
```

2. Wait for the script to process and provide a report regarding the success or failure of the process.

The following is an example of a script that could be used to establish remote mirror and copy relationships for volume pairs.

```
mkpprc -dev IBM.1750-1303561 -remotedev IBM.1750-7504491 -type mmir 1000-103F:2300-233F
mkpprc -dev IBM.1750-1303561 -remotedev IBM.1750-7504491 -type gcp 1100-113F:2340-237F
mkpprc -dev IBM.1750-1303561 -remotedev IBM.1750-7504491 -type mmir 1800-187F:2800-287F
mkpprc -dev IBM.1750-1303561 -remotedev IBM.1750-7504491 -type gcp 1200-127F:2500-257F
mkpprc -dev IBM.1750-1303561 -remotedev IBM.1750-7504491 -type mmir 1040-1054:2700-2714
mkpprc -dev IBM.1750-1303561 -remotedev IBM.1750-7504491 -type gcp 1055-107F:2400-242A
mkpprc -dev IBM.1750-1303561 -remotedev IBM.1750-7504491 -type mmir 1140-117F:2600-263F
```

Using the DS CLI interactive command mode (history and reports)

Use the DS CLI interactive command mode when you must process multiple transactions that cannot be incorporated into a script. The interactive command mode provides a history function that makes repeating or checking prior command usage easy to do.

In addition to being able to enter DS CLI commands at the DS CLI command prompt, a history function provides a view of the last DS CLI commands that you have used. It also allows you to repeat any of the last commands more quickly than having to type out the entire command. The example at the end of this process shows how the history function works.

Note: Many of the DS CLI commands have a feature that allows you to specify a dash (-) for the parameter and the specified value is read from standard input. However, you cannot use the dash (-) while in the DS CLI interactive command mode.

Perform the following steps to use the DS CLI in the interactive command mode:

1. Log on to the DS CLI application at the directory where it is installed.
2. Provide the information that is requested by the information prompts. The information prompts might not appear if you have provided this information in your profile file. The command prompt switches to a **dscli** command prompt.
3. Begin using the DS CLI commands and parameters. You are not required to begin each command with **dscli** because this prefix is provided by the **dscli** command prompt.

Tip: Issue the **setoutput** command to control how the reports that are generated by the **list** commands are displayed on your computer. The **setoutput** command allows you to set or display command output format options. For example, you can specify that the reports be displayed in one of the following formats:

- **delim** = displays output in a table format and sets the column delimiter to a single character
- **xml** = displays output in XML format
- **stanza** = displays output in stanza (horizontal table) format

See the **setoutput** command for more details.

To use the DS CLI history function that is associated with the interactive command mode, perform the following steps:

1. Issue an exclamation mark (!) to display CLI commands that you have used in the current session. For example: `dscli>!` results in a list of commands such as the following:

```
[4] lsarraysite -dev IBM.1750-1300771
[3] lsarray -dev IBM.1750-1300771
[2] lsextpool -dev IBM.1750-1300771
[1] lsextpool -dev IBM.1750-1300771
```
2. Issue `dscli>!1` to retry the last command. Or, issue `dscli>!3` to retry command [3].

Obtaining the serial (storage image ID) number using the DS CLI

Almost every DS CLI command requires the use of the storage image ID. If you add your target storage image ID into your profile file under the *devid* designation, you are not required to provide the storage image ID when you issue each command.

Use the **lssi** DS CLI command to list the storage image IDs that are associated with your storage complex. It is recommended that you record the target storage image ID in your profile file. This can save you input time when you have to process many transactions that cannot be part of a script.

To obtain a list of the storage image ID numbers, perform the following steps. The storage image ID consists of the manufacture name (IBM), the machine type (1750), and the serial number.

1. Log into the DS CLI application in interactive command mode (if you are not already logged in).
2. Enter the following command format at the `dscli` command prompt to obtain the storage image IDs.

```
dscli>lssi -s -hdr off
```
3. Wait for the command to process. The following type of report is generated, which lists the storage image IDs that are associated with the storage complex.

IBM.1750-68FA111
IBM.1750-68FA112
IBM.1750-68FA120

DS CLI command help

You can obtain online help for each CLI command. To obtain the help, type the word *help* and the command name at the `dscli` command prompt. There are additional parameters that you can use with the help command that designate the type of help information that you can receive.

The **help** command contains the following parameters that influence the type of help information that you can receive:

Command	Description
help	Displays a list of all the DS CLI commands that are available for use.
help -s	Displays a list of commands with brief descriptions.

Command	Description
help -l	Displays a list of commands with their associated syntax.
command_name -h command_name -help command_name -? help command_name	Displays the reference page (man page) for the command name.
help -s command_name	Displays the brief description for the command name.
help -l command_name	Displays the usage statement for the command name.

Note: You cannot use the **-s** and **-l** parameters with the following help command flags: **-h**, **-help**, and **-?**.

Examples

The following examples represent the type of information that is displayed when you use various parameters with the help command. Each of these examples start at the dscli command prompt.

Note: Much of the information that is associated with the **help** command is displayed in list format. You can include the page (**-p on**) and row (**-r number**) controls; for example, `dscli>help -p on -r 20`. This command pauses your page listing after 20 entries and prompts you to **press any key to continue**.

Example 1

```
dscli>help
```

This line of input provides the entire list of DS CLI commands. Only the command names are displayed. No other details are provided.

Example 2

```
dscli>help -s
```

This line of input provides the entire list of DS CLI commands and a short description for each command. The short description explains what each command accomplishes.

Example 3

```
dscli>help -l
```

This line of input provides the entire list of DS CLI commands and the syntax for each command. In addition, you see all the help syntax and formatting parameters, which can make your reading of the help difficult. For example, you can see something similar to the following for each command:

```
lsxtpool [ { -help|-h|-? } ] [ { -l (long)|-s (short) } ]
[-fmt default|xml|delim|stanza] [-p on|off] [-delim char]
[-hdr on|off] [-bnr on|off] [-r #] [-v on|off] [-fullid]
[-hmc1 SMC1] [-hmc2 SMC2] [-user username] [-passwd password]
-dev storage_image_ID [-stgtype fb|ckd] [-rankgrp 0|1]
[Extent_Pool_ID ... | -]
```

The following line is the actual syntax for the **lsextpool** command: `-dev storage_image_ID [-stgtype fb|ckd] [-rankgrp 0|1] [Extent_Pool_ID ... | -]`

Example 4

```
dscli>lssi -h
dscli>lssi -help
dscli>lssi -?
dscli>help lssi
```

Any of the previous lines of input generates the entire help page that is associated with the **lssi** command. This is the same information that is found in the *IBM System Storage DS6000 Command-Line Interface User's Guide* or in the Information Center for the **lssi** command.

Example 5

```
dscli>help -s lssi
```

This line of input provides the short description that is associated with the designated command. For instance, you might see the following:

```
lssi
```

The **lssi** command displays a list of storage images in a storage complex. You can use this command to look at the status of each storage image in the list. The storage image worldwide node name (WWNN) is displayed when this command is used. You must use the storage image WWNN when using the **lsavailprcport** and **mkpprcpath** commands.

Example 6

```
dscli>help -l lssi
```

This line of input displays the entire reference page found in both the *IBM System Storage DS6000 Command-Line Interface User's Guide* and in the Information Center for the **lssi** command.

Obtaining and interpreting DS CLI exit codes

Complete this task to obtain and interpret DS CLI exit codes.

Whenever you complete a transaction using the DS CLI single-shot mode or the script mode, an exit code is generated. However, no exit codes are generated when you use the DS CLI interactive mode, because you never leave the DS CLI session.

When you use the single-shot mode, an exit code is generated after each DS CLI command is fully processed. When you use the script mode, exit codes are only generated when the script exits the session. In script mode, you must interpret output for the status.

DS CLI exit codes provide more general reasons (than the error messages provide) why a CLI command transaction has failed. The following table lists the exit codes and their meanings.

Note: Only the code number is displayed when you are using the single-shot or script mode not the code description.

Code	Category	Description
0	Success	Specifies that the command is successfully processed
2	Syntax Error	Specifies that there is an error in the way that the command is presented (misaligned or wrong parameters) for processing
3	Connection Error	Specifies that there is a connectivity or protocol error
4	Server Error	Specifies that an error occurs during a function call to the application server
5	Authentication Error	Specifies that an error occurs during the authentication process
6	Application Error	Specifies that an error occurs due to a MetaProvider client application specific process

Perform the following steps to obtain, interpret and use the DS CLI exit codes.

1. (Script mode) Retrieve the most recent exit code. For a Windows operating system, use "%ERRORLEVEL%" to retrieve the most recent exit code. For a UNIX or Linux operating system, use "\$?" to retrieve the most recent exit code.

The following examples demonstrate the retrieval commands. The first part of the example shows the command that failed and the second part of the example shows the code to obtain the DS CLI exit code.

Windows operating system

```
C:\Program Files\ess\cli>dscli test
CMMCI9013E Command: test was not found.
Tip: Enter "help" for a list of available commands.
C:\Program Files\ess\cli>echo %ERRORLEVEL%
2
```

UNIX or Linux operating system

```
aix23 ->dscli test
CMMCI9013E Command: test was not found.
Tip: Enter "help" for a list of available commands.
echo $?
2
```

2. Use the previous table to interpret the value that is associated with the code and correct the command according to the exit code description.

Processing that determines your next course of action

Based on the interpretation of the exit code value and the following processing description that is associated with a failed DS CLI transaction, you can determine your next course of action.

Single-shot mode

The following processing is associated with a single-shot mode transaction:

- All operations of the DS CLI transaction that can be processed are processed even though an error has occurred with one or more of the processed parameters that are associated with the transaction.

- A report on all successful completions is generated.
- A report on all failures is generated.

Script mode

The following processing is associated with a script mode transaction:

1. A DS CLI failure exit code is issued.
2. The script mode is automatically exited with no additional processing.

Activating your machine and feature licenses using the DS CLI

Use the steps described in this task to activate your license activation codes. These codes must be activated before any configuration can be applied to your DS6000 network.

The following licenses can be activated depending on your purchase:

- Operating environment license for each storage unit that you own. (This license must be activated.)
- Copy Services, which can consist of the following features:
 - FlashCopy
 - Remote mirror and copy
- Parallel access volumes (PAV)

There are multiple codes that are associated with these features. To obtain the information that you need to activate these licenses and features in your storage unit, go to the IBM Disk Storage Feature Activation (DSFA) Web site at:

<http://www.ibm.com/storage/dsfa/>

Download your codes onto a diskette in XML format. You can then import the codes from the XML file when you process the DS CLI `applykey` command.

Note: In most situations, the DSFA application can locate your order confirmation code (OCC) when you enter the DS6000 (1750) serial number and signature. However, if the OCC is not attached to the 1750 record, you must assign it to the 1750 record in the DSFA application. In this situation, you must have the OCC (which you can find on the License Function Authorization document).

The DS CLI **`applykey`** command activates the licenses for your storage unit. The DS CLI **`lskey`** command verifies which type of licensed features are activated for your storage unit.

Perform the following steps to activate your license activation codes.

1. Log into the DS CLI application in interactive command mode (if you are not already logged in).
2. Issue the DS CLI **`applykey`** command at the `dscli` command prompt as follows (this example presumes that your XML file is named "keys" and it resides on a diskette in your A: drive): `dscli> applykey -file a:\keys.xml`
IBM.1750-68FA120
3. Press Enter. When the process has completed, the following message is displayed:
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI
Version 5.0.0.0 DS: IBM.1750-68FA120
Licensed Machine Code key xxxx, key xxxx successfully applied.

4. Verify that the keys have been activated for your storage unit by issuing the DS CLI **lskey** command as follows: `lskey IBM.1750-68FA120`
5. Press Enter and the following type of report is displayed:
Sun Apr 09 02:23:49 PST 2006 IBM DS CLI

Activation Key	Authorization Level (TB)	Scope
Operating Environment (OEL)	45	All
Remote mirror and copy (RMC)	25	All
Remote mirror for z/OS (RMZ)	25	CKD
Point in time copy (PTC)	25	All
Parallel access volumes (PAV)	On	CKD

Enabling remote support using the command-line interface

Remote support enables IBM support personnel to quickly assist you with problem determination and, with your consent, remotely perform certain maintenance procedures.

Enabling the DS6000 remote support function helps optimize the availability of the DS6000. You can set up your site to receive and send e-mail notifications as well as use the Call Home function. The Call Home function alerts IBM of a problem or a potential problem as soon as it occurs. This enables IBM Customer Service to be proactive in assisting you with maintaining your DS6000 in an optimal state. You or remote support can use the DS Storage Manager or the command-line interface to send problem determination data to IBM.

To take advantage of remote support, you must allow one of the following outside connections:

- A VPN connection
- An Internet connection through your firewall that allows IBM to connect to your storage management system
- A modem connection. The DS CLI cannot be used to configure this feature. You must use the DS Storage Manager to configure the modem call home feature.

You can set up remote support through the DS Storage Manager or through the command-line interface. This section describes how to use the DS CLI commands to set up remote support.

Setting up contact information using the DS CLI

Complete this task to establish your contact information in your system. When you use any of the remote support features, the contact information you supply is sent to IBM so that an IBM service representative can contact you.

You **must** supply the following information when you are setting up for remote support:

- Company name
- Ship state or province

- Ship location
- Ship country
- Contact primary phone number
- Machine identification (consists of the manufacture, machine type, and serial number)
- Primary e-mail address (required if you are using the Call Home e-mail notification feature).

It is also recommended that you supply the following additional types of information when setting up for remote support:

- Company address
- Machine location (the physical location of the machine)
- Machine address (where the machine is physically located)
- Ship phone (the telephone number of the person to contact when parts are being shipped)
- Ship to city
- Ship postal code
- Contact name (the name of the system administrator who can be contacted by IBM service personnel)
- Contact alternate phone number

Use the **setcontactinfo** command to provide the contact information that is needed for the remote support function.

Perform the following steps to establish your contact information in the system. The example commands that are displayed in this task are shown in two formats. The first format provides the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **setcontactinfo** command to supply the contact information. Enter the **setcontactinfo** command at the dscli command prompt with the following parameters and variables:

```
dscli>setcontactinfo -companyname company_name -shipstate [state, province]
                    -shiploc building_location -shipcountry country
                    -contactpriphone primary_phone_number
                    -contactemail primary_email_address storage_image_ID
```

Example

```
dscli>setcontactinfo -companyname Examples -shipstate AZ
                    -shiploc bld1300 -shipcountry US -contactpriphone 520-799-8001
                    -contactemail example@example.com IBM.1750-68FA120
```

Notes:

- a. The phone number is displayed with hyphens that separate the various parts.
 - b. If you decide to use the company address, ensure that you use double quotation marks around your input. For example:
-companyaddr "9210 S. High Rd Tucson Az 85744"
2. Press Enter. The following message is displayed if the process is successful:
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120

The contact information settings were successfully modified

3. Issue the **showcontactinfo** command to verify that the contact information is active in your system. Enter the **showcontactinfo** command at the dscli prompt with the following parameter:

```
dscli>showcontactinfo storage_image_ID
```

Example

```
dscli>showcontactinfo IBM.1750-68FA120
```

A report is displayed showing the contact information that is established and recognized by your system.

Setting up Call Home (SMTP) notifications using the DS CLI

Complete this task to set up the Call Home function to contact IBM support using e-mail when a problem occurs on your storage unit. The **setsmtp** command is used to set up the e-mail feature of the Call Home function.

Note: The Call Home function also has a modem call home feature. The DS CLI cannot be used to configure this feature. You must use the DS Storage Manager to configure the modem call home feature.

Consider the following requirements before you use the **setsmtp** command to set up e-mail notifications:

- You must know your SMTP port and IP address, because these are required to activate the e-mail notifications. This information specifies where a message is sent in the event of a problem.
- Your system must recognize all the required contact information before you can issue the **setsmtp** command. This includes the following information:
 - Company name
 - Ship state
 - Ship location
 - Ship country
 - Primary contact phone number
 - Primary e-mail address (required if you are using the call home e-mail notification feature).

Perform the following steps to activate the e-mail notification support option feature. The example commands that are displayed in this task are shown in two formats. The first format provides the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **showplex** command to obtain a report that provides your SMTP port and IP address. Enter the **showplex** command at the dscli command prompt with the following parameter:

```
dscli>showplex storage_image_ID
```

Example

```
dscli>showplex IBM.1750-68FA120
```

2. View the report and make a copy of it. The important thing is that you have a record of the SMTP and SNMP IP addresses and port numbers that are used in setting up the Call Home function.
3. Issue the **showcontactinfo** command. This command displays a report that allows you to ensure that the required contact information, including the primary e-mail address, has been set in the system. Enter the **showcontactinfo** command at the dscli command prompt with the following parameter:

```
dscli>showcontactinfo storage_image_ID
```

Example

```
dscli>showcontactinfo IBM.1750-68FA120
```

4. Review the report and ensure that all the required contact information has been set in the system, including the primary e-mail address. If any of the required information is missing, issue the **setcontactinfo** command before you proceed with this task.
5. Issue the **setsmtp** command to specify where a message is sent in the event of a problem. Enter the **setsmtp** command at the dscli command prompt with the following parameters and variables:

```
dscli>setsmtp -server smtp_server_IP:port_number -emailnotify [on, off]  
storage_image_ID
```

Example

```
dscli>setsmtp -server 9.11.242.12:25 -emailnotify on  
IBM.1750-68FA120
```

6. Press Enter. The following message is displayed if the process is successful:

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120
```

The SMTP settings were successfully modified

Setting up your account information using the DS CLI

Complete this task to set up your account information which is needed when using the Call Home function. You must use the **setplex** command to associate a unique name with the 1750, which in turn allows you to open a secure shell connection to a storage unit for remote support.

Before you can activate and test the Call Home function, ensure that the following tasks have been completed:

- You have supplied the following required contact information using the **setcontactinfo** command:
 - Company name
 - Ship state
 - Ship location
 - Ship country
 - Primary contact phone number
 - Primary e-mail address (required if you are using the call home e-mail notification feature).
- You have supplied the location where e-mail notifications are sent by specifying the SMTP port and IP address through the **setsmtp** command.

To set up your account information, provide the following information:

- Account number
- The secure shell connection enabled
- Storage image ID (manufacture, machine type, and serial number) unless you have stored this information in your profile file

Note: The example in the following steps presumes that the storage image ID information has not been stored in the profile file.

Perform the following steps to set up your account information. The example commands that are displayed in this task are shown in two formats. The first

format provides the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **setplex** command to establish your account information in the system. Enter the **setplex** command at the dscli command prompt with the following parameters and variables:

```
dscli>setplex -acct account -allowrssh enable storage_image_ID
```

Example

```
dscli>setplex -acct 101010 -allowrssh enable IBM.1750-68FA120
```

2. Press Enter. The following message is displayed if the process is successful:

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120
```

```
Storage Plex successfully modified
```

3. Issue the **showplex** command to verify that your system recognizes the account information. Enter the **showplex** command at the dscli command prompt with the following parameter:

```
dscli>showplex storage_image_ID
```

Example

```
dscli>showplex IBM.1750-68FA120
```

A report is displayed that details the properties of your 1750 storage complex. Detailed properties include names, descriptions, and notification settings for the storage complex.

Activating the Call Home function using the DS CLI

Complete this task to activate the Call Home function using the DS CLI. The Call Home function allows the transmission of operational and error-related data to IBM. It is the capability that allows the storage unit to alert IBM support of machine conditions.

Note: The Call Home function also has a modem call home feature. The DS CLI cannot be used to configure this feature. You must use the DS Storage Manager to configure the modem call home feature.

Before you can activate and test the Call Home function, ensure that the following tasks have been completed:

- You have supplied your required contact information using the **setcontactinfo** command. This consists of the following information:
 - Company name
 - Ship state
 - Ship location
 - Ship country
 - Primary contact phone number
 - Primary e-mail address (required if you are using the call home e-mail notification feature).
- You have supplied the location where e-mail notifications are sent by specifying the SMTP port and IP address through the **setsmtp** command.
- You have set up your account information using the **setplex** command.

Use the **setdialhome** command to enable the Call Home function. You can designate the machine and enable the function on the machine with this command. Use the **testcallhome** command to verify that the Call Home function is active.

Perform the following steps to activate and test the Call Home function for your storage unit. The example commands that are displayed in this task are shown in two formats. The first format provides the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **setdialhome** command to activate the Call Home function. Enter the **setdialhome** command at the dscli command prompt with the following parameters and variables:

```
dscli>setdialhome -action enabled storage_image_ID
```

Example

```
dscli>setdialhome -action enabled IBM.1750-68FA120
```

2. Press Enter. The following message is displayed if the process is successful:

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120
```

```
The dial home settings were successfully modified
```

3. Issue the **testcallhome** command to verify that the Call Home function is active. Enter the **testcallhome** command at the dscli command prompt with the following parameter:

```
dscli>testcallhome storage_image_ID
```

Example

```
dscli>testcallhome IBM.1750-68FA120
```

4. Press Enter. The following message is displayed if the process is successful:

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120
```

```
A test problem record was successfully created.
```

Setting up SNMP notifications using the DS CLI

One of the support options you can configure for your storage unit involves the notification of Simple Network Management Protocol (SNMP) alert traps. SNMP notifications are alerts and notifications of thresholds that have been exceeded and exception events that have occurred. This task shows you how to set up your storage unit to receive these notifications as they occur.

You need to know your SNMP port and IP address as these are required when activating the notifications feature. This information specifies where a message is sent in the event of a problem.

To use the **setsnmp** command to activate the SNMP alert notification support option feature, perform the following steps:

1. Log in to the DS CLI application in interactive command mode, if you are not already logged in.
2. Specify where a message is sent in the event of a problem by issuing the **setsnmp** command at the dscli command prompt as follows:

```
dscli>setsnmp -server 9.11.242.12:161 IBM.1750-68FA120
```

3. Press Enter and a successful process displays the following message:

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120
```

```
The SNMP settings were successfully modified
```


Setting up SIM notifications using the DS CLI

Service information messages (SIMs) are generated by a storage unit for S/390 and zSeries hosts. You can designate the level of error you want to be notified about and how often you want to be notified.

It is recommended that you determine your levels of notification before using the `setsim` command. You need to decide what type of message should generate a message. You have the following choices including a level of severity, severity designations are the same for each type of message. You can also designate how often you want to be notified.

SIM message types consist of the following:

- DASD service information messages
- Media service information messages
- Storage unit messages

SIM severity designations consist of the following choices:

- acute - An irrecoverable error with possible loss of data.
- moderate - A system path is not operational and performance might be degraded.
- serious - An irrecoverable error or a data check with loss of access to data.
- service - A recoverable error, equipment checks, or data checks. You can defer repair.
- none

SIM notifications for each message type can be in the range of 0-5 time.

To set up your SIM notification choices using the `setsim` command, perform the following steps:

1. Log in to the DS CLI application in interactive command mode, if you are not already logged in.
2. Specify your notification choices using the following example format for the **setsim** command. At the `dscli` command prompt type the following:

```
dscli>setsim -dasdlevel serious -dasdnotify 3 -medialevel moderate  
-medianotify 2 -sulevel service -sunotify 1 IBM.1750-68FA120
```
3. Press Enter and a successful process displays the following message:

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120
```

The SIM settings were successfully modified

Setting up user accounts using the DS CLI

This scenario describes how to set up a user account. You must have administrator authority to enable this function.

The admin account is set up automatically at the time of installation. It is accessed using the user name **admin** and the default password **admin**. This password is temporary and expires after its initial use. You must change the password before you can use any of the other functions. There are 7 groups the administrator can assign to a user. A user can be assigned to more than one user group. The groups and the associated functions allowed by the assignment are as follows:

admin

All users that you assign to the administrator user group allows access to all storage management console server service methods and all storage image resources.

op_volume

The volume operator user group allows access to service methods and resources that relate to logical volumes, hosts, host ports, logical subsystems, logical volumes, and volume groups, excluding security methods. In addition, this user group inherits all authority of the monitor user group.

op_storage

The storage operator user group allows access to physical configuration service methods and resources, including storage complex, storage image, array, rank, and extent pool objects. This user group inherits all the authority of the op_copy_services and monitor user groups, excluding security methods.

op_copy_services

The copy services operator user group allows access to all Copy Services service methods and resources, excluding security methods. In addition, this user group inherits all authority of the monitor user group.

service

The service user group includes monitor authority, plus access to all management console server service methods and resources, such as performing code loads and retrieving problem logs.

monitor

The monitor user group allows access to list and show commands. It provides access to all read-only, nonsecurity management console server service methods and resources.

no_access

The no_access user group does not allow access to any service methods or storage image resources. By default, this user group is assigned to any user account in the security repository that is not associated with any other user group.

In addition to assigning users to one or more user groups, you also must assign a default password to each user. When you notify users of their group assignment and default password, indicate that the default password is only good for the initial log on. Users must change the password at the time of their initial log on. Also, remind all users to record their password in a safe place, because there is no way that the administrator or the application can retrieve a password.

Note: You must change the default password for an account, including the **admin** account, to be able to use any CLI command other than the one to change the password. See the `chuser` command for more information.

Use the `mkuser` DS CLI command to create new user accounts with specific roles (user group or groups) and an initial password. If you assign multiple roles to an account, ensure that you separate the different roles by using a comma for example, `op_volume, op_storage`. See the `mkuser` command description for more details.

1. Log into the DS CLI application in interactive command mode.
2. Issue the following command from the `dscli` command prompt to assign a user to an account with a default password: `dscli>mkuser -pw AB9cdefg -group service,op_copy_services testuser`

3. Press Enter and observe the processing result. A successful process returns the following display:

```
Sun Aug 11 02:23:49 PST 2004 IBM DS  CLI
Version 5.0.0.0 DS: IBM.1750-68FA120
User Name testuser successfully created.
```

Creating a default configuration setup with a profile file

You can create default settings for the command-line interface by defining one or more profiles on the system. For example, you can specify the storage management console (SMC) for the session, the output format for list commands, the number of rows per page in the command-line output, and the banner that is included with the command-line output.

If a user enters a value with a command that is different from a value in the profile, the command overrides the profile.

You have several options for using profile files:

- You can modify the default profile. The default profile, `dscli.profile`, is installed in the profile directory with the software. For example, `c:\Program Files\IBM\DSCLI\profile\dscli.profile` is the directory path for the Windows platform and `/opt/ibm/dscli/profile/dscli.profile` is the directory path for UNIX and Linux platforms.
- You can create a personal default profile by making a copy of the system default profile as `<user_home>/dscli/profile/dscli.profile`.
- You can create a profile for the storage unit operations. Save the profile in the user profile directory. For example:

```
<user_home>\dscl\profile\operation_name1
```

```
<user_home>\dscl\profile\operation_name2
```

These profile files can be specified using the DS CLI command parameter `-cfg <profile_name>`. If the `-cfg` profile file is not specified, the user's default profile file is used. If a user's profile file does not exist, the system default profile file is used.

The home directory `<user_home>` is defined by the Java system property named "user.home". The location of your password file is determined by your operating system. The following examples are home directories in different operating systems:

Windows operating system

For a Windows operating system, the property value defaults to the environment variable `%USERPROFILE%`. As a result, your personal profile is `C:\Documents and Settings\username\dscli\profiles\dscli.profile`.

UNIX or Linux operating system

For an UNIX or Linux operating system, the property value defaults to the environment variable `$HOME`. As a result, your personal profile is `~/dscli/profile/dscli.profile`.

OpenVMS system

For an OpenVMS operating system, the property value defaults to the logical name `SY$LOGIN`. As a result, your personal profile is `[.dscli.profile]dscli.profile`.

Note: The values of the Java system properties can be redefined by JRE options. If you are having problems, check to see if you have an environment setting like the following on your local system:

```
_JAVA_OPTIONS=-Duser.home=...
```

When you install the command-line interface software, the default profile is installed in the profile directory with the software. The file name is dscli.profile. For example. c:\Program Files\IBM\DSCLI\profile\dscli.profile.

Example profile file modification: The following steps represent a typical modification process for some of the key items. Making these changes before you begin using DS CLI commands could save you time.

1. Click the DSCLI icon on your desktop (a DOS window opens)
2. Enter edit dscli.profile at the command prompt. The profile configuration file is displayed.
3. Scroll down to the # sign in front of HMC1: and remove the # sign.
4. Enter the correct IP address of your management console.
5. Scroll down to the # sign in front of DEVID and remove the # sign.
6. Enter the serial number of your machine type (include the values for manufacture, machine type, and serial number).
7. Save the file.
8. Enter cd.. at your command prompt.
9. Enter DSCLI at your command prompt and the DS CLI applications starts. You are asked to provide only your user ID and password and not the address of your management consoles.

Table 1 provides the list of profile variables that you can use to create the profile.

Table 1. Profile variables

Variable	Description
banner: on off	Enables or disables the banner that appears before the command output. This variable is equivalent to the command option -bnr . The command option -bnr overrides this default value.
delim	Specifies a delimiter character for the format: delim variable. The default character is a comma. This variable is equivalent to the command option -delim . The command option -delim overrides this default value.
devid	Specifies the storage image ID that is the target for the command. This value is equivalent to the command option -dev . The command option -dev overrides this default value.
format	Specifies the output format for list commands. Specify one of the following formats: • default: Specifies default output. • xml: Specifies XML format. • delim: Specifies columnar format. Columns are delimited with the character that you must specify with the delim variable. • stanza: Specifies a horizontal table. This variable is equivalent to command option -fmt . The command option -fmt overrides this default value.
fullid	Specifies that IDs display in fully qualified format, which includes the storage image ID.

Table 1. Profile variables (continued)

Variable	Description
header: on off	Enables or disables the headers that display with the columns of data in the list commands. This variable is equivalent to the command option -hdr . The command option -hdr overrides this default value.
hmc1	Specifies the primary Storage Manager IP address. This variable is equivalent to the command option -hmc1 . The command option -hmc1 overrides this default value.
hmc2	Specifies the secondary Storage Manager IP address. This variable is equivalent to the command option -hmc2 . The command option -hmc2 overrides this default value.
locale	Specifies the language for the output on the local computer. • ar: Arabic • be: Byelorussian • bg: Bulgarian • ca: Catalan • cs: Czech • da: Danish • de: German • el: Greek • en: English • es: Spanish • et: Estonian • fi: Finnish • fr: French • gu: Gujarati • hi: Hindi • hr: Croatian • hu: Hungarian • in: Indonesian • is: Icelandic • it: Italian • iw: Hebrew • ja: Japanese • kk: Kazakh • kn: Kannada • ko: Korean • lt: Lithuanian • lv: Latvian (Lettish) • mk: Macedonian • mr: Marathi • ms: Malay

Table 1. Profile variables (continued)

Variable	Description
locale, <i>continued</i>	- nl: Dutch - no: Norwegian - pa: Punjabi - pl: Polish - pt: Portuguese - ro: Romanian - ru: Russian - sa: Sanskrit - sh: Serbo-Croatian - sk: Slovak - sl: Slovenian - sq: Albanian - sr: Serbian - sv: Swedish - ta: Tamil - te: Telugu - th: Thai - tr: Turkish - uk: Ukrainian - vi: Vietnamese - zh: Chinese
paging: on off	Controls the display of output. If paging is enabled, a limited number of lines of output displays when a command is issued. The lines do not scroll. You must set the number of lines per page with the rows variable. This variable is equivalent to command option -p . The command option -p overrides this default value.
timeout	Set timeout value of client/server synchronous communication. The unit of the value is second. The default value is 420 seconds. You can set this timeout if the processing of a command ends by timeout due to network or client/server performance issue. Note: The command timeout value can be longer than this value because one command can consist of multiple client/server requests.
timeout.connection	Set timeout value to establish client or server connection. The unit of this value is seconds. The timeout value must be greater than zero. System default socket timeout value is used if the value is set to zero. The default value is 20 seconds. Notes: - If the DS CLI returns a connection error, check for the following conditions: - Is there a secure physical connection between the client and server? - Is the default timeout value too short to establish a connection? - Setting a connection timeout value too short can cause unexpected connection problems.

Table 1. Profile variables (continued)

Variable	Description
remotedevid	Specifies the remote storage image ID. This variable is equivalent to the command option -remotedev . The command option -remotedev overrides this default value.
rows	Specifies the number of rows per page of output if the paging variable is enabled. This variable is equivalent to command option -r . The command option -r overrides this default value.
verbose: on off	Enables or disables verbose output. This variable is equivalent to the command option -v . The command option -v overrides this default value.

Example

```
#
# DS CLI Profile
#

#
# Management Console/Node IP Address(es)
# hmc1 and hmc2 are equivalent to -hmc1 and -hmc2 command options.
#hmc1: 127.0.0.1
#hmc2: 127.0.0.1

#
# Default target Storage Image ID
# "dev" and "remotedevid" are equivalent to
# "-dev storage_image_ID" and "-remotedev storage_image_ID" command options,
# respectively.
#dev: IBM.1750-AZ12341
#remotedevid: IBM.1750-AZ12341

#
# locale
# Default locale is based on user environment.
#locale: en

# Timeout value of client/server synchronous communication in second.
# DSCLI command timeout value may be longer than client/server communication
# timeout value since multiple requests may be made by one DSCLI command
# The number of the requests made to server depends on DSCLI commands.
# The default timeout value is 420 seconds.
#timeout: 900

# Socket connection timeout value in seconds.
# The timeout value must be greater than zero.
# System default socket timeout value is used if timeout value is set to zero.
# The default connection timeout value is 20 seconds.
#timeout.connection: 20

# Output settings
#
# ID format of objects:
# on: fully qualified format
# off: short format
fullid: off

# Paging and Rows per page.
# paging enables/disables paging the output per line numbers specified by "rows".
# "paging" is equivalent to "-p on|off" option.
# on : Stop scrolling per output lines defined by "rows".
# off : No paging. (default)
# "rows" is equivalent to "-r #" option.
```

```

|      paging: off
|      #rows: 24
|
|      # Output format type for ls commands, which can take one of the following values:
|      #   default: Default output
|      #   xml      : XML format
|      #   delim    : delimit columns using a character specified by "delim"
|      #   stanza   : Horizontal table format
|      # "format" is equivalent to option "-fmt default|xml|delim|stanza".
|      #format: default
|
|      # delimiter character for ls commands.
|      #delim: |
|      # Display banner message. "banner" is equivalent to option "-bnr on|off".
|      #   on : Banner messages are displayed. (default)
|      #   off : No Banner messages are displayed.
|      banner: on
|
|      #
|      # Display table header for ls commands. "header" is equivalent
|      # to option "-hdr on|off".
|      #   on : Table headers are displayed. (default)
|      #   off : No table headers are displayed.
|      header: on
|
|      #
|      # Display verbose information. "verbose" is equivalent to option "-v on|off".
|      #   on : Display verbose information.
|      #   off : No verbose information.
|      verbose: off
|
|      # End of Profile

```

Registering for the My Support function

Complete this task to register for the My Support function.

The My Support function provides proactive notification of code updates through an e-mail address that you specify. My Support automatically notifies you of the latest code updates and how to obtain them. It is highly recommended that you register for My Support.

To access online technical support, go to the following Web site:

<http://www-1.ibm.com/servers/storage/support/disk/ds6800/>

My Support registration provides e-mail notification when new firmware levels have been updated and are available for download and installation. To register for My Support, perform the following steps:

1. Go to the following Web site: <http://www.ibm.com/support/mySupport> and click **register now**.
2. On the My IBM registration Step 1 of 2 page, fill in the required information. Items with an asterisk (*) are required fields. Click **Continue**.
3. On the My IBM registration Step 2 of 2 page, fill in the required information. Items with an asterisk (*) are required fields. Click **Submit**. Click **Continue**.
4. On the Sign in page, enter your IBM ID and password and click **Submit**.
5. On the My support page, click **Edit profile**. Select the information that is required for your profile in the **Products** section.
 - a. From the **Products** list, select **Storage**.

- b. From the second list, select **Computer Storage**.
 - c. From the third list, select **Disk Storage Systems**.
 - d. From the fourth list, select **System Storage DS6000 series**.
 - e. Select the **System Storage DS6800** check box.
 - f. Click **Add products**.
 - g. Review your profile for accuracy.
6. Click **Subscribe to email**. In the **Documents** list, select **Storage**. Then select the **Please send these documents by weekly email** check box, select the **Downloads and drivers** check box, and select the **Flashes** check box. Click **Update**.
7. In the **Welcome** area, click **Sign out** to end your session.

Chapter 7. OpenVMS system integration

You can adjust your OpenVMS system to obtain greater benefits from the use of the DS CLI application. The hints and tips that are provided in this section show how to obtain these benefits through the optimal integration of the DS CLI into your OpenVMS system.

The following list provides the areas that you might consider for optimizing the use of the DS CLI in your OpenVMS system:

- Command Console LUN (CCL)
- OpenVMS system messages
- Message help
- Java Run Time Environment (JRE)
- Quota recommendations

Enhancing the command console LUN for DS CLI use

The OpenVMS operating system considers a fibre-channel device with LUN ID 0 as Command Console LUN (CCL). These devices do not normally display when you issue the DS CLI **lshostvol** command. However, with adjustments, these devices can be displayed when you issue the **lshostvol** command. The following description provides the information that you need to make this enhancement work on your OpenVMS system.

Fibre-channel CCL devices have the OpenVMS device type GG, which result in OpenVMS device names in the form \$1\$GGAn. In contrast, fibre-channel disk devices have the OpenVMS device type DG, which result in device names in the form \$1\$DGA_n. Therefore, LUN 0 devices on OpenVMS are a special device type, different from disk devices.

The DS CLI **lshostvol** command displays the mapping of host device names or volume names to machine type 2105, 2107, and 1750 volume IDs. That implies that all host devices belonging to 2105/2107/1750 volumes are displayed. Therefore, CCL devices \$1\$GGAn are included in the **lshostvol** output for multiplatform consistency and to match the output of other DS CLI commands.

However, the inclusion of CCL devices can be confusing for users who expect that the **lshostvol** command displays only the disk devices. You can use the OpenVMS logical name **IBMDCLI\$SHOW_GG_DEVICES** to modify the DS CLI behavior: If this logical name translates to an expression which evaluates as True in OpenVMS conventions (1, Y, YES, T, or TRUE), then the \$1\$GGAn CCL devices are shown in the command output. Otherwise, the \$1\$GGAn CCL devices are not shown.

The startup procedure **IBMDCLI\$STARTUP.COM** defines the logical name **IBMDCLI\$SHOW_GG_DEVICES** as Y. If you want to suppress \$1\$GGAn CCL devices in the **lshostvol** command output, you can redefine the logical name after the startup procedure has been processed.

Enhancing the OpenVMS system messages

When you use the DS CLI, the application provides messages regarding the application processes, status, and errors. You also receive the OpenVMS system messages but they are displayed in a different format. You can make this situation less confusing by making the following adjustments.

The DS CLI messages are presented in an operating-system independent format. In contrast, native OpenVMS programs provide messages using the system message facility as displayed in the following format: **%facility-level-identification, text**.

To ensure that the OpenVMS command **SET MESSAGE** and customer-written tools that scan for such messages work correctly, the DS CLI provides each message using OpenVMS system services in addition to the operating system independent output. After displaying the OpenVMS message, the normal DS CLI message is provided unchanged. This ensures that the DS CLI messages are identical across platforms and that you can work with the DS CLI documentation.

However, these redundant messages can be confusing for users who are not familiar with OpenVMS. You can use the OpenVMS logical name **IBMDCLI\$OPENVMS_MESSAGES** to modify the DS CLI behavior: If this logical name translates to an expression which evaluates as True in OpenVMS conventions (1, Y, YES, T, or TRUE), then the additional OpenVMS-formatted messages are presented. Otherwise, only the operating system independent DS CLI messages are shown.

The startup procedure **IBMDCLI\$STARTUP.COM** defines the logical name **IBMDCLI\$OPENVMS_MESSAGES** as Y. If you want to suppress the OpenVMS-formatted messages, you can redefine the logical name after the startup procedure has been processed.

Enabling OpenVMS to use the DS CLI help

The DS CLI installation process offers the option to add modules to the system help library. If you enable OpenVMS with this option, you can use the DS CLI help.

The DS CLI installation process offers the option to add modules to the system help library **SY\$COMMON:[SYSHLP]HELPLIB.HLB** and the system messages database **SY\$COMMON:[SYSHLP]MSGHLP\$LIBRARY.MSGHLP\$DATA**. If you choose this option, the module **IBMDCLI** is added as the top-level key to the help library, and the DS CLI status messages can be accessed using the **HELP/MESSAGE/FACILITY=IBMDCLI** command. Additionally, the login procedure **IBMDCLI\$MANAGER:IBMDCLI\$LOGIN.COM** activates the message section file **IBMDCLI\$SYSTEM:IBMDCLI_Messages_Shr.exe** for the current process.

In every case, the installation process provides the following files in the directory which is referred by the logical name **IBMDCLI\$HELP**:

IBMDCLI_Ovr.hlp

A help library containing one module with the top-level key **IBMDCLI**. You can add this library to the search list for help libraries in your OpenVMS system by defining appropriate logical names **HLP\$LIBRARY**, **HLP\$LIBRARY_1**, **HLP\$LIBRARY_2**, and so forth.

IBMDCLI_Messages.msghlp\$data

A message help data file with messages for facility IBMDCLI. You can add this data file to the searchlist for message help files in your OpenVMS system by defining the logical name MSGHLP\$LIBRARY accordingly.

If you do not want the installation process to modify the OpenVMS system libraries, you can use these OpenVMS default logical names to integrate the DS CLI help information manually.

Java Runtime Environment considerations for DS CLI

The DS CLI login procedure **IBMDCLI\$MANAGER:IBMDCLI\$LOGIN.COM** defines **JAVA\$CLASSPATH** in the OpenVMS process logical name table and it overrides any existing Java classpath definition. If you want to use other Java-based software in the same process, you must redefine **JAVA\$CLASSPATH** so that it provides the classpath as a JAVA command parameter.

The following information provides an overview of how the installation of the DS CLI affects the Java environment of your OpenVMS system.

Because the DS CLI relies on Java Run Time Environment (JRE) V1.4.2, mandatory JRE files are installed in the directory tree that is referenced by the logical name **IBMDCLI\$JRE**. This setup is according to HP guidelines. The login procedure **IBMDCLI\$MANAGER:IBMDCLI\$LOGIN.COM** calls the JRE setup procedure which defines several logical names and DCL symbols for usage by the Fast Virtual Machine.

If your OpenVMS host system uses other software that requires JRE but cannot run with the same JRE version as the DS CLI, users of that software can switch between different Java versions. To use different JRE versions, you must run a command procedure to set up the Java environment definitions for the version that you want to use in the given process (see the OpenVMS Java documentation at:

http://h18012.www1.hp.com/java/documentation/1.4.2/ovms/docs/user_guide.html

The DS CLI application-specific Java classes are bundled in Java Archive (.JAR) files in the directory referenced by logical name **IBMDCLI\$LIBRARY**. These files must be included in the Java classpath. On OpenVMS, two logical names define the classpath:

CLASSPATH

For UNIX-style names. You can use a string inside single quotation marks that consists of colon-separated path names.

JAVA\$CLASSPATH

For OpenVMS specification syntax. You can specify multiple paths with a comma-separated expression (not enclosed in single quotation marks) as OpenVMS logical name search list. **JAVA\$CLASSPATH** overrides **CLASSPATH**, if **JAVA\$CLASSPATH** is defined.

Because of this override process, you might have to redefine the **JAVA\$CLASSPATH** to provide the class path as a JAVA command parameter. However, this JAVA command parameter is only required if you want to use other Java-based software in the same process.

Quota considerations for DS CLI

The JRE was designed to perform optimally on UNIX systems, where each process is given large quotas by default. On OpenVMS, the default behavior gives each process lower quotas so that many processes can co-exist on a system.

To get the best Java performance on OpenVMS, HP recommends that you set process quotas to match a typical UNIX system. HP also recommends these as minimum quota settings (except where noted). See these recommendations at:

http://h18012.www1.hp.com/java/documentation/1.4.2/ovms/docs/user_guide.html

To check if your current process quotas fulfill the recommendations, you can run the following process: `IBMDCLI$JRE:[LIB]Java$Check_Environment.com`.

Chapter 8. Configuring and managing logical storage

This section provides the information that you need to configure and maintain your logical storage whether it consists of fixed block volumes or count-key-data volumes.

You must complete a logical configuration for each storage unit. For example, each storage unit must be assigned a worldwide node name (WWNN). You must also configure the arrays, ranks, logical subsystems or logical control units, and extent pools from which your logical volumes are created.

After your initial configuration, you might make adjustments in your configuration and in time you might delete your configuration and create a new one. The processes that are listed in this section are designed to help you complete these tasks using the DS CLI commands.

Configuring new fixed block storage using the DS CLI

This section describes how you can configure new fixed block storage within a storage unit by using the command-line interface.

Before you begin, you must be logged into the DS CLI application in interactive command mode. You must also be connected to a storage unit that is used for open systems host system storage.

The creation of the fixed block storage configuration is described first. The configuration of the storage unit SCSI host ports to enable access to fixed block storage is described second. You can run these two basic steps in the reverse order, but it is better to create storage configurations first, thereby creating the media to back up configuration data that is not related to the storage configuration.

Configuring new fixed block storage involves the following processes:

- Creating fixed block extent pools
- Creating arrays
- Creating and associating ranks with extent pools
- Creating fixed block volumes
- Creating fixed block volume groups
- Configuring fibre-channel I/O ports
- Creating SCSI host port connections

Note: All the examples provided in the described tasks are based on the premise of using the interactive mode of DS CLI. If you were processing many transactions, you would likely use the script mode to process your transactions.

Creating extent pools for fixed block volumes using the DS CLI

Complete this task to create fixed block volume extent pools. This is the first step in configuring new fixed block storage. You can use the DS CLI commands to create extent pools for fixed block volumes.

Creating the extent pools before the arrays and ranks saves a processing step. When you create the new ranks, you can assign them to existing extent pools. Otherwise, you must modify each rank object to complete the extent pool ID assignment after the extent pools have been defined.

Each extent pool is defined with the rank group of 0 or 1 and a storage type of **fb**. You must define one extent pool for each rank group and storage type combination. This means that you must make a minimum of two extent pools for a storage unit that contains fixed block storage: one fixed block extent pool per rank group.

Extent pools that are defined for rank group 0 or 1 are assigned an even- or odd-numbered extent pool ID, respectively. Even-numbered extent pools are managed by storage server ID 0. Odd-numbered extent pools are managed by storage server ID 1. Each rank is assigned to one extent pool; therefore, storage server workload is affected by the rank assignments to even- and odd-numbered extent pool IDs. It is better to evenly distribute rank and extent pool allocations in order to keep the storage server workloads balanced.

You can create more than the minimum number of extent pools. For example, you can define unique extent pools for each RAID type (5 or 10) that is configured in a storage image. Or, you can define and name extent pools according to the host system attachments that access the volumes that are created from extent pool extents. You can have the same number of extent pools as ranks.

i5/OS considerations

i5/OS supports only specific volume sizes and these might not be an exact number of extents. i5/OS volumes are defined in decimal gigabytes (10^9 bytes). You can use the following table when you are creating the logical volumes for use with i5/OS. You will notice that in almost every case, the i5/OS device size does not match a whole number of extents, so some space can be wasted for you specific configuration.

Pro- tected Model Type	Unpro- tected Model Type	i5/OS Device size (dec- imal giga- bytes)	Number of LBAs	Extents	Unus- able space (binary giga- bytes)	Usable space%
xxxx-A01	xxxx-A81	8.5	16 777 216	8	0.00	100.00
xxxx-A02	xxxx-A82	17.5	34 275 328	17	0.66	96.14
xxxx-A05	xxxx-A85	35.1	68 681 728	33	0.25	99.24
xxxx-A04	xxxx-A84	70.5	137 822 208	66	0.28	99.57
xxxx-A06	xxxx-A86	141.1	275 644 416	132	0.56	99.57
xxxx-A07	xxxx-A87	282.2	551 288 832	263	0.13	99.95

Note: Only Ax2, Ax4 and Ax5 models are supported as external LSU LUNs.

Use the **lsextpool** and **mkextpool** commands to create the fixed block extent pools. You must be logged into the DS CLI application and connected to the storage unit that will be used for open systems host system storage.

Perform the following steps to create the fixed block extent pools. The example commands displayed in this task are shown in two formats. The first format shows the type of information the command requires. The second format provides the command with declared values for the variables

1. Issue the **mkextpool** command to create the fixed block extent pool for rank group 0. Enter the **mkextpool** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkextpool -dev storage_image_ID -rankgroup [0 | 1]
-stgtype fb extent_pool_name
```

Example

```
dscli>mkextpool -dev IBM.1750-68FA120 -rankgrp 0 -stgtype fb P0
```

where *P0* represents the extent pool name that you assign. This name can be 16 double-byte characters.

2. Press Enter. A successful process displays the following message:

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

```
Extent pool P0 successfully created.
```

Note: The unique name that you assigned to the extent pool does not display in the process message. However, when you issue the **lsextpool** command, the extent pool name is displayed.

3. Repeat Step 1 for each extent pool that you want to create. Try to evenly distribute rank and extent pool allocations in order to keep the storage server workloads balanced.
4. Verify the extent pool assignments by issuing the **lsextpool** command when you are done creating the extent pools. Use the **-l** parameter to display a full report for the extent pools that are assigned to the storage unit. Enter the **lsextpool** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsextpool -dev storage_image_ID -l
```

Example

```
dscli>lsextpool -dev IBM.1750-68FA120 -l
```

Creating arrays for fixed block volumes using the DS CLI

Complete this task to create arrays using the DS CLI commands.

The machine type 1750 contains at least one storage enclosure, with a minimum of four DDMs.

The DDMs of a storage enclosure are partitioned into array sites. A machine type 1750 array site consists of four DDMs in one storage enclosure of a storage enclosure pair, with two-to-eight (four DDM) array sites per storage enclosure pair. All storage enclosure pairs must have identical capacity, rpm, and interface characteristics, and an interface to a common DA pair.

The creation of arrays is based on the array sites that are associated with the storage unit. Use the **lsarraysite** and **mkarray** commands to create the arrays.

You want to make an array from 1 or 2 array sites. An array inherits the characteristics of its parent array sites and is given a RAID type attribute (5 or 10). A 1750 array object of RAID type 5 or 10 is made from one or two (4 DDMs) array sites. The status of the array is “unassigned” until the array is assigned to a rank.

Perform the following steps to create an array from unassigned array sites:

1. Issue the **lsarraysite** command to view a list of array site IDs for all installed array sites. Review those arrays that are designated with the state of unassigned. Enter the **lsarraysite** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsarraysite -dev storage_image_ID -state unassigned
```

Note: If this is your first time creating fixed block volumes, all the arrays are displayed with a state of unassigned.

2. Press Enter. A report of unassigned array sites is displayed. Use the list to identify unassigned array site capacity, rpm, and device adapter (DA) pair attributes. Record the RAID type for each array site.
3. Issue the **mkarray** command to create an array from either one or two array sites with the status "unassigned". Enter the **mkarray** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkarray -dev storage_image_ID -raidtype [5 | 10] -arsite array_site
```

Consider the following when you create the arrays:

- Specify one or two array sites with identical capacity, rpm, interface, and DA pair attributes.
 - The new array inherits the capacity, rpm, interface, and DA pair characteristics of its parent array sites.
 - The state of the array remains unassigned until it is assigned to a rank.
4. Repeat Step 3 until all unassigned array sites have been assigned to an array.
 5. Verify that the array-to-array site assignment is recognized and complete by issuing either the **lsarray** or **lsarraysite** command with the **-l** parameter.

Creating a rank using the DS CLI

Complete this task to create a rank using the DS CLI commands. A rank is a logically contiguous storage space that is made up of one array. You can assign a rank to every unassigned array.

A rank inherits the characteristics, including the RAID type, of its parent array and is given a storage type attribute of either FB (fixed block) or CKD (count key data). The rank configuration state is unassigned until it is assigned to an extent pool. An "unassigned" rank is not associated with either rank group 0 or 1. Any unassigned rank can be assigned to an extent pool that is associated with either rank group 0 or 1.

Note: You can assign a rank to an unassigned array and also assign the rank to an extent pool at the same time if you have already created the extent pools and the arrays. Creating extent pools first saves a step in the configuration.

Use the **lsarray**, **mkrank**, and **lsrank** commands to assign a rank to each unassigned array. You must be logged into the DS CLI application and connected to the storage unit that will be used for open systems host system storage.

To create ranks, perform the following steps:

1. Ensure you have a list of the unassigned arrays for which ranks must be assigned. Issue the **lsarray** command to obtain this list if you do not already have it. Enter the **lsarray** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsarray -dev IBM.1750-68FA120 -state unassigned
```

2. Issue the **mkrank** command to assign a rank to rank group 0 or 1 according to the rank group number of the assigned extent pool ID. Enter the **mkrank** command at the dscli command prompt with the following parameters and variables:

```
mkrank -dev IBM.1750-68FA120 -array A44 -stgtype fb  
-extpool P1
```

Notes:

- a. You can specify either the **-wait** or the **-extpool** parameter when you use the **mkrank** command. Either of these parameters allows you to be notified if the rank configuration has failed for any reason.
 - b. If you use the **-wait** parameter, you cannot issue other commands until the entire transaction has processed.
3. Press Enter to display a report of rank assignments for your entire storage unit. Because the process of creating the rank involves formatting drives, it could take some time before the process finishes. If you want to check on the process, you can issue the **lsrank** command from a different DS CLI session. A successful process displays the following type of message:

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Device: IBM.1750-68FA120  
  
Rank IBM.1750-68FA120/R44 successfully created.
```
 4. Repeat Step 2 until all unassigned arrays are assigned a rank and an extent pool.
 5. Issue the **lsrank** command to verify that ranks and extent pools have been assigned. Enter the **lsrank** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsrank -dev IBM.1750-68FA120 -l
```
 6. Press Enter to display a report of the rank assignments for your entire storage unit.

Creating fixed block volumes using the DS CLI

Complete this task to create fixed block volumes.

You must have completed the following tasks before you can create your fixed block volumes:

- Created your extent pools.
- Created your arrays.
- Created and assigned your ranks.

Perform the following steps to create fixed block volumes:

1. View your list of fixed block extent pool IDs and determine which extent pool IDs that you want to use as the source for the fixed block logical volumes. You obtained this list when you first created your extent pools. If this list is not available, issue the **lsextpool** command to obtain the list of extent pool IDs. Enter the **lsextpool** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsextpool -dev IBM.1750-13AAD7A -stgtype fb -l
```

Extent pool attributes determine the size and quantity of volumes that can be created. The extent pool ID (even/odd) indicates the storage server (0|1), which dictates that the LSS ID component of the volume ID must be an even or an odd number.

2. Issue the **lsaddressgrp** command to find unassigned and available address groups. Enter the **lsaddressgrp** command at the dscli command prompt with the following parameters and variables:

```
dscli> lsaddressgrp -dev IBM.1750-68FA120 -1
```

An address group refers to a group of LSSs. Up to 16 LSSs can be grouped into one address group. All LSSs in an address group must be of the same format (CKD or fixed block).

Note: If this is your first time creating fixed block volumes, all the address groups are displayed with a state of "unassigned".

3. Analyze the address group list to determine which LSSs can be used to make fixed block volumes.

Consider the following conditions when doing your analysis:

- If the address group list is empty, then all address groups are available to be defined (0 - 3).
- If an undefined address group is used to create new fixed block volumes, select the lowest numbered address group.
- If you are adding new fixed block volumes to an existing fixed block address group, use the **lsyss** command to identify LSSs that are already defined in the target address group.

4. Issue the **mkfbvol** command to create fixed block volumes for the specified LSS. Enter the **mkfbvol** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkfbvol -dev IBM.1750-68FA120 -extpool P1  
-name finance#d -cap 8.6 0100-010f
```

Consider the following conditions with regard to the command example in this step:

- All volumes will have the same type and capacity attributes.
- The **-extpool** parameter identifies a fixed block extent pool containing available data extents.
- The **-name** parameter allows you to assign an easy-to-use label or nickname to the volume. The volume name parameter can include a wild card (#d or #h) that inserts a decimal or hexadecimal volume ID value into the volume name.

Note: The decimal designation does not apply to the volume ID number or the number of volumes that were created by the command. It only applies to the unique name that you have assigned. Also, when you process this command, the volume name that you have assigned does not appear in the confirmation message. To view the volume name that you have assigned, issue the **lsfbvol** or **showfbvol** command.

- The **-cap** (capacity) parameter is 8.6 GB. The default is binary GB where 1 GB = 1 073 741 824 (2³⁰ bytes)
- The example provides a range of numbers (0100 - 010F) for the number of volumes to be created. Because volumes are created using the hexadecimal numbering system, the range in the example creates 16 volumes. The actual number of volumes that can be created is 255 per LSS based on the following criteria:
 - The volume ID is a 32 bit number that can be represented as 4 hexadecimal digits in the form of XYZZ where X is the address group (0 - 1), XY together is the logical subsystem number 00 - 1E, and ZZ is the volume number (00 - FF).

- DS6000 has a 16 384 volume address space that is partitioned into 64 logical subsystem (LSS) units, where each LSS contains 256 logical volume numbers. The 64 LSS units are assigned to one of 4 address groups, where each address group contains 16 LSSs, or 4096 volume addresses. All of the LSSs in one address group must be of the same type (CKD or fixed block).
5. Repeat step 4 for all of the required logical volumes for each LSS.
 6. Issue the **lsfbvol** command to display a report you can use to confirm the status of your fixed block volumes. Enter the **lsfbvol** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsfbvol -dev IBM.1750-68FA120 -l -volgrp V2,V20
```

Note: It is possible that the report will display that there was a configuration error that is associated with one or more of your **mkfbvol** transactions.

Creating LUN volumes for System i systems

Complete this task to create fixed block LUN volumes for System i systems.

You must have completed the following tasks before you can create your fixed block LUN volumes:

- Created your extent pools
- Created your arrays
- Created and assigned your ranks

When you begin your initial configuration, the LSSs and address groups do not exist. The LSS's are created when the first volume of the LSS's is defined during the processing of the **mkfbvol** command; likewise, the address group gets defined when the first LSS is defined.

When you create volumes, you must designate the logical subsystem (LSS) that a particular volume belongs to. After you assign a volume ID, use the first two digits to designate the LSS. For example, if you specify a volume ID of 1900, the volume then belongs to LSS 19.

Consider the following specifications before you create your fixed block LUN volumes:

- Volumes that belong to an even numbered rank group (cluster) must be in an even numbered LSS; volumes that belong to an odd numbered rank group (cluster) must be in an odd numbered LSS. The cluster that a volume belongs to is determined by specifying the extent pool that the volume is assigned to.
- LSS number 1F is reserved for internal use and must not be used as a volume ID.
- You must define each volume as protected or unprotected. This is simply a notification to i5/OS; it does not mean that the volume is protected or unprotected. In reality, all LUNs are protected, either by RAID5 or RAID10. Defining a volume as unprotected means that it is available for i5/OS to mirror that volume to another internal or external volume of equal capacity. Unless you intend to use i5/OS (host based) mirroring, define your logical volumes as protected.

Under some circumstances, you might want to mirror the i5/OS internal Load Source Unit (LSU) to a LUN in the DS6000. In this case, define only one LUN volume as unprotected; otherwise, i5/OS attempts to mirror all unprotected volumes.

- In general, it is best to use one LSS for volumes from one rank.

Perform the following steps to create fixed block LUN volumes:

1. View your list of fixed block extent pool IDs and determine which extent pool IDs that you want to use as the source for the fixed block logical volumes. You obtained this list when you first created your extent pools. If this list is not available, issue the **lsxtpool** command to obtain the list of extent pool IDs. Enter the **lsxtpool** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsxtpool -dev IBM.1750-13AAD7A -stgtype fb -1
```

Extent pool attributes determine the size and quantity of volumes that can be created. The extent pool ID (even | odd) indicates the storage server (0 | 1), which dictates that the LSS ID component of the volume ID must be an even or an odd number.

2. Issue the **mkfbvol** command to create fixed block LUN volumes for the specified LSS. Enter the **mkfbvol** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkfbvol -dev IBM.1750-13AAD7A -extpool p0  
-os400 A05 -name i5_unprot_#h 1001-1002
```

Consider the following conditions with regard to the command example in this step:

- The **-extpool** parameter identifies a fixed block extent pool containing available data extents.
- The **-os400** parameter allows you to designate the size and protection of a LUN volume by specifying the volume model. The example shows LUN volumes of protected model type A05 with a size of 35.1 decimal gigabytes.
- The **-name** parameter allows you to assign an easy-to-use label or nickname to the volume. The volume name parameter can include a wildcard (#d or #h) that inserts a decimal or hexadecimal volume ID value into the volume name.

Note: The hexadecimal designation does not apply to the volume ID number or the number of volumes that were created by the command. It only applies to the unique name that you have assigned. Also, when you process this command, the volume name that you have assigned does not appear in the confirmation message. To view the volume name that you have assigned, issue the **lsfbvol** or **showfbvol** command.

- The example provides a range of numbers (0101 - 0102) for the number of volumes to be created. The actual number of volumes that can be created is 255 per LSS based on the following criteria:
 - The volume ID is a 32 bit number that can be represented as 4 hexadecimal digits in the form of XYZZ where X is the address group (0 - 1), XY together is the logical subsystem number 00 - 1E, and ZZ is the volume number (00 - FF).
 - You can define up to 31 LSSs in a storage unit. Even numbered LSSs have an association with storage unit server 0. Odd numbered LSSs have an association with storage unit server 1. LSS number 1F is reserved.
3. Repeat step 2 for all of the required logical volumes for each LSS.
 4. Issue the **lsfbvol** command to display a report you can use to confirm the status of your LUN volumes. Enter the **lsfbvol** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsfbvol -dev IBM.1750-13AAD7A -1
```


Correcting a fixed block configuration error

Complete this task to correct a fixed block volume configuration error.

There might be occasions when you are using the **mkfbvol** command to create fixed block volumes, but the transaction fails. You might not be aware of the failure until you run the **lsfbvol** or the **showfbvol** command to check the status of the volumes that you have created.

The **lsfbvol** or the **showfbvol** commands display reports that includes a *configstate* category. The configuration state category reports on the current state of the rank. One of the configuration state codes is **configuration error**.

A status of **configuration error** specifies that the configuration process did not complete successfully. This state reflects an internal error condition and is not an indication that there was a user input error.

You might want to gather additional information about what caused the error, which can help you determine how to correct it. Generally, to correct this error state, you must delete the designated volume configuration and submit a new transaction request.

Perform the following steps to obtain additional information about the configuration error and to correct this error condition.

1. Add the **-v** (verbose) command flag to your **mkfbvol** command, and reissue the command for the transactions that show the configuration error designation.

Note: You can also turn on the verbose mode in your profile file, and reissue the command.

If you designate the verbose mode, the display of extra output includes the error code that is generated when the create rank transaction fails.

2. Issue the **rmfbvol** command to delete the designated volume configurations if you do not want to obtain additional information about what caused the configuration error.

Note: In the majority of instances, this is the only method for correcting a configuration error.

Creating fixed block volume groups using the DS CLI

Complete this task to create fixed block volume groups.

A volume group identifies the set of fixed block logical volumes that are accessible by one or more SCSI host system ports. SCSI host system access is constrained to the identified access mode. Only those SCSI host ports that are registered to a volume group ID are allowed to access the set of logical volumes that is contained by the volume group.

Logical volumes can be assigned to a volume group when the volume group is created, or the logical volumes can be added (or removed) at a later time. The volume group type determines the maximum number of volumes that can be assigned to a volume group, either a maximum of 256 volumes or a maximum of 64 000 volumes. The volume group type must be selected according to the addressing capability of the SCSI host system that will use the volume group.

Perform the following steps to create and view fixed block volume groups:

1. Issue the **mkvolgrp** command to create a fixed block volume group. Enter the **mkvolgrp** command at the dscli command prompt with the following parameters and variables:

Note: Repeat this step for each volume group that you want to create.

```
dscli>mkvolgrp -dev IBM.1750-68FA120 -hosttype pSeries  
-volume 0001-0010,0120 my_nickname
```

Notes:

- a. You can use the **-hosttype** parameter with the **mkvolgrp** command. This parameter is an easier way of specifying the type of volume group. If you do not use the **-hosttype** parameter, it is assumed that the volume group type is **scsimask**.
 - b. You cannot use the **-type** parameter and the **-hosttype** parameter together.
 - c. If your volume group is not **scsimask** type and you do not want to use the **-hosttype** parameter, use the **-type** parameter. **scsimask** as the default value of the **-type** parameter; you can also specify **scsimap256** or **os400mask** as your volume group type. Because you need to know the criteria that is associated with these volume group types, see the **mkvolgrp** command for more information.
 - d. Volume IDs must meet the following criteria:
 - ID ranges must be separated by a comma (displayed as 0001-0010,0120 in the example).
 - For **scsimap256**, the array or ranges cannot exceed 256 volume ID entries. Otherwise, up to 64 384 entries are allowed.
 - Use the **-type os400mask** parameter if the volume group is limited to fixed block volume OS400-protected or OS400-unprotected types. Otherwise, the volume group is limited to the fixed block volume type 1750.
 - The volume group name (*my_nickname* in the example command) must be unique within the scope of the specified storage unit.
2. Issue the **lsvolgrp** command to create a list of assigned volume group IDs. Enter the **lsvolgrp** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsvolgrp -dev IBM.1750-68FA120 -l
```

Notes:

- a. The **lsvolgrp** command with the **-l** parameter displays a report with the following 3 values:
 - Name (the unique name that you assigned to the volume group)
 - Volume group ID
 - Type (the configured volume group type)
- b. You can narrow the scope of the report by requesting a specific type of volume. See the **lsvolgrp** command for information about the **-type** parameter.

Creating a volume group for System i systems

Complete this task to create volume groups for System i systems so that volumes can be assigned to the i5 fibre-channel adapters.

Use the **mkvolgrp** command to create a volume group that contains the volumes to be assigned to an i5 fibre-channel adapter. The following considerations determine how you will create your volume groups:

- If you are using a multipath connection, a volume group is assigned to two or more i5 fibre-channel adapters. Each fibre-channel adapter provides one path to volumes in the volume group.
- If you are using an external load source, you create a volume group that contains one volume. After a partition is initially loaded from the external load source, you can add more volumes to this volume group so that the i5/OS recognizes them and can use them.
- If you do not use an external load source, you create a volume group that contains all the volumes that are assigned to an i5 fibre-channel adapter. You cannot specify more than 32 LUN volumes for each attachment to an i5 fibre-channel adapter.

When you create a volume group for i5/OS, you should specify the **-hosttype iSeries** parameter as part of the **mkvolgrp** command. The **-hosttype iSeries** parameter saves some processing time because this parameter automatically supplies information that would have to be specified separately. For example, the i5/OS uses a logical blocksize of 520, and volumes that are created for i5/OS use a blocksize of 520 bytes. By specifying the **-hosttype iSeries** parameter, also you denote that the logical size of the blocks in the volumes is 520 bytes.

Perform the following steps to create and view volume groups for System i systems:

1. Issue the **mkvolgrp** command to create a volume group. Enter the **mkvolgrp** command at the dscli command prompt with the following parameters and variables:

Note: Repeat this step for each volume group that you want to create.

The following two examples provide the commands that you can use to create volume groups depending on whether you use the external load source. The first example creates a volume group that contains one unprotected volume if you do use an external load source. (If you are using an external load source, you can initially only have one volume in the volume group.) The second example creates a volume group that contains all volumes if you do not use an external load source.

Example 1 (using an external load source)

```
dscli>mkvolgrp -dev IBM.1750-13ABVDA -hosttype iSeries -volume 1000 blue
```

```
Date/Time: July 5, 2005 11:57:50 PM GMT+01:00 IBM DSCLI Version: 5.0.4.32
DS: IBM.1750-13ABVDA
CMUC00030I mkvolgrp: Volume group V14 successfully created.
```

Example 2 (not using an external load source)

```
dscli>mkvolgrp -dev IBM.1750-13ABVDA -hosttype iSeries -volume 1000-1002 blue
```

```
Date/Time: July 5, 2005 11:57:50 PM GMT+01:00 IBM DSCLI Version: 5.0.4.32
DS: IBM.1750-13ABVDA
CMUC00030I mkvolgrp: Volume group V14 successfully created.
```

Notes:

- a. The confirmation message for the end process shows that the created volume group is automatically assigned an ID that is different from the name of the volume group that you specify in the command. You will see the name that you assigned associated with

the volume group when you use the **lsvolgrp** and **showvolgrp** commands. However, if you want to work specifically with the volume group, you must reference the volume group ID.

- b. This volume group is also referred to as SCSI520-MASK. When an error message is displayed for the OS400 MASK, SCSI520-MASK is referenced instead.
 - c. If you do not use an external load source, it is a good practice to create a volume group that contains all the volumes that will be assigned to the i5 fibre-channel adapter.
 - d. System i only supports 32 device addresses per volume group.
2. Issue the **lsvolgrp** command to create a list of assigned volume group IDs. Enter the **lsvolgrp** command at the dscli command prompt with the following parameters and variables:
dscli>lsvolgrp -dev IBM.1750-13ABVDA -l

Notes:

- a. The **lsvolgrp** command with the **-l** parameter displays a report with the following three values:
 - Name (the unique name that you assigned to the volume group)
 - Volume group ID (the identification number of the volume group)
 - Type (the configured volume group type)
 - b. You can narrow the scope of the report by requesting a specific type of volume. See the **lsvolgrp** command for information about the **-type** parameter.
3. Verify your host type information by issuing the **lshosttype** command using the following command format at the dscli command prompt:
dscli>lshosttype -type os400mask
This command displays a report like the following:

Name	Profile	AddrDiscovery	LBS
iSeries	IBM iSeries - os400	reportlun	520

Note: You can obtain the same results if you use the **-type os400all** parameter.

Configuring fibre-channel I/O ports using the DS CLI

Complete this task to configure fibre-channel I/O ports using the DS command-line interface.

Before you begin, you must have the command-line interface prompt, and you must be connected to a storage unit that will be used for open systems host system storage.

In this process, you must designate the topology for the I/O port. The following three topology settings are available:

fibre channel arbitrated loop (coded as fc-al in the setiport command)

Enables the SCSI ULP with a FC-AL topology. The FC-AL topology does not support PPRC path I/O operations.

SCSI-FCP (coded as scsi-fcp in the setiport command)

Enables the SCSI ULP with a point-to-point or switched fabric topology. PPRC path I/O operations are enabled for this setting.

Note: Designate this topology for System i systems using i5/OS level V5R3M5 and above.

ficon (coded as ficon in the setiport command)

Enables the FICON ULP with a point-to-point or switched fabric topology. PPRC path I/O operations are not supported for FICON ULP.

The storage unit supports the fibre-channel host adapter (HA) card type. For machine type 1750, one or two HA cards are installed in each of the two CEC assemblies. Use the **lsiport** and **setiport** commands to configure fibre-channel I/O ports.

Each fibre-channel HA card contains four I/O ports. The storage image microcode automatically creates one I/O port to represent each HA card I/O port. The default fibre-channel I/O port settings enable SCSI-FCP “identified” access to fixed block volumes. You might have to modify the I/O port settings to enable SCSI FC-AL access to fixed block volumes.

To configure the fibre-channel ports, perform the following steps:

1. View a list of fibre-channel port IDs by typing the following command format at the dscli command prompt:

```
dscli>lsiport -dev IBM.1750-75FA120 -l -type fc
```

A detailed report is displayed that lists the fibre-channel I/O ports.

2. Analyze the report and determine which I/O port IDs that you want to access the fixed block volumes.

Configure a minimum of four I/O ports for SCSI host I/O operations. Select ports with physical locations on different host bus adapter (HA) cards. If possible, locate the HA cards in different I/O enclosures.

3. Set the I/O ports that you have identified to enable the FC-AL (fibre-channel arbitrated loop), SCSI-FCP, or FICON topology. The following example shows how to enable the FC-AL topology by typing the following command format at the dscli command prompt:

Note: I/O ports are automatically set to the offline state and returned to the online state after configuration changes are applied.

```
dscli>setiport -dev IBM.1750-75FA120 -topology fc-al  
0012 0013 0112 0113
```

4. Press Enter. A successful process returns a confirmation message indicating that the port IDs have been successfully configured.

Creating SCSI host port connections using DS CLI

Complete this task to create SCSI host port connections using the DS command-line interface.

Before you begin, you must have the command-line interface prompt, and you must be connected to a storage unit that can be used for open systems host system storage.

The 1750 machine type supports the “identified” access mode for SCSI host attachments, which requires that all SCSI host ports be identified to a storage unit. One SCSI host port connection must be created for each SCSI host port that accesses storage unit fixed block volumes. Use the **lshosttype**, **mkhostconnect**, and **lshostconnect** commands to create the SCSI host port connections.

A SCSI host port contains attributes that identify the following information:

- SCSI host system type
- Port profile
- Port WWPN
- Volume group ID that the port accesses
- An array of storage unit I/O port IDs that the host port logs into for volume access
- An attribute to indicate that all I/O ports can be used for volume access
- Host port description
- Port nickname

There are two ways that you can approach this task:

- Use the **-hosttype** parameter with the **mkhostconnect** command. Using the **-hosttype** parameter is the best solution for most users.
- Use the **mkhostconnect** command with the **-lbs**, **-addrdiscovery**, and **-profile** parameters.

Notes:

1. Specifying the **-hosttype** parameter automatically sets the **-lbs**, **-addrdiscovery**, and **-profile** values.
2. If you do not use the **-hosttype** parameter, you must issue the **lsportprof** command to ensure that you obtain the correct values to use with the **-lbs**, **-addrdiscovery**, and **-profile** parameters.
3. You cannot use the **-hosttype** parameter with these other parameters.

The following task is described from the assumption that you have used the **-hosttype** parameter.

To configure the SCSI host ports, perform the following steps:

1. Obtain your host type information by issuing the **lshosttype** command. Enter the **lshosttype** command at the dscli command prompt with the following parameters and variables:

```
dscli>lshosttype -l -type volumeGroup_type
```

This command displays a report like the following:

Name	Profile	AddrDiscovery	LBS	Description
pSeries	IBM pSeries - AIX	reportlun	512	IBM pSeries, RS/6000 and RS/6000 SP Servers (AIX)
zLinux	IBM zSeries - zLinux	lunpolling	512	IBM zSeries Servers (Linux)
iSeries (if os400all was specified)	IBM iSeries - os400	reportlun	520	IBM iSeries Servers (System i)

Note: Volume group type is one of the following designations (use a separate command for each choice):

- ficonall
- scsiall

- scsimask
- scsimap256
- os400all
- os400mask

The same results are displayed when you specify os400all or os400mask or when you specify scsiall and scsimask or scsimap256.

2. Create SCSI host ports by issuing the **mkhostconnect** command. Enter the **mkhostconnect** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkhostconnect -dev storage_image_ID -wwname wwpn
             -hosttype host_type -volgrp volume_group_ID -ioport port_ID
             host_name
```

Notes:

- a. The **-wwname** parameter specifies the 16-character worldwide name that is assigned to the host system fibre-channel adapter port. This WWPN value is validated each time that the host system port logs into an I/O port.
 - b. The **-hosttype** parameter specifies fibre-channel communications layer characteristics that might be unique according to the host system manufacturer, operating system, or version of the system. Typical specifications are iSeries, pSeries, an so on.
 - c. The **-volgrp** parameter specifies the volume group ID that this host port can access. Host port objects might be created prior to creating volume groups, in which case you must use the **chhostconnect** command to add volume group ID assignments at a later time.
 - d. The **-ioport all** specifies SCSI host port (WWPN) access into all IO ports that are configured for the FC-AL or SCSI-FCP topology.
 - e. **host_name** specifies the SCSI host system nickname that you have assigned.
3. Repeat Step 2 for each SCSI host system port that will access LUN volumes.
 4. Verify that all SCSI host ports have been configured and that they are recognized by the storage unit according to your specifications by issuing the **lshostconnect** command with the **-l** parameter.

Configuring new count key data storage using DS CLI

This section describes how to configure new count key data (CKD) storage within your storage unit for a zSeries host system.

Before you begin, you must be logged into the DS CLI application in interactive command mode. You must also be connected to a storage unit that is used for zSeries systems host storage.

Configuring CKD storage involves two basic processes: the creation of the CKD storage configuration and the configuration of the storage unit I/O ports for zSeries host system attachment. These two basic processes can be performed in the reverse order, but it is better to create storage configurations first. Creating the storage configuration first creates the media to back up configuration data that is not related specifically to the storage configuration.

Configuring new CKD storage involves the following processes:

- Creating CKD extent pools
- Creating arrays
- Creating and associating ranks with extent pools
- Creating logical control units
- Creating CKD volumes
- Creating CKD volume groups (system generated).

The internal microcode automatically creates the CKD FICON All volume group ID (V10) and automatically assigns all CKD base and alias volumes to this volume group. This volume group ID (V10) is automatically assigned to storage unit I/O fibre channel ports that are configured for FICON I/O operations.

- Configuring fibre-channel I/O ports

Creating count key data extent pools using the DS CLI

Complete this task to create CKD volume extent pools. This is the first step in configuring new count key data storage. You can use the DS CLI commands to create extent pools for CKD volumes.

Creating the extent pools before the arrays and ranks saves a processing step. When you create the new ranks, you can assign them to existing extent pools. Otherwise, you must modify each rank object to complete the extent pool ID assignment after the extent pools have been defined.

Each extent pool is defined with the rank group of 0 or 1 and a storage type of **ckd**. At a minimum, you must define one extent pool for each rank group and storage type combination. This means that you must make a minimum of two extent pools for a storage unit that contains CKD storage: one CKD extent pool per rank group.

Extent pools that are defined for rank group 0 or 1 are assigned an even- or odd-numbered extent pool ID, respectively. Even-numbered extent pools are managed by storage server ID 0. Odd-numbered extent pools are managed by storage server ID 1. Each rank group is assigned to one extent pool; therefore, storage server workload is affected by the rank assignments to even- and odd-numbered extent pool IDs. It is better to evenly distribute rank and extent pool allocations in order to keep the storage server workloads balanced.

Notes:

1. You can create more than the minimum number of extent pools. For example, you can define unique extent pools for each RAID type (5 or 10) that is configured in a storage image. Or, you can define and name extent pools according to the host system attachments that access the volumes that are created from extent pool extents.
2. You can have the same number of extent pools as ranks.

Use the **lsextpool** and **mkextpool** commands to create the CKD extent pools. You must be logged into the DS CLI application and connected to the storage unit that will be used for your zSeries host system.

To make your extent pools, perform the following steps:

1. **Find defined CKD extent pools** by issuing the **lsextpool** command to display a list of the existing CKD extent pools. Type the following command at the dscli command prompt:

```
dscli> lsextpool -dev IBM.1750-75FA120 -stgtype ckd
```

2. **Analyze the extent pool listing** for the following information.

- Does the minimum set of extent pools exist? There must be one extent pool for rank group 0 and one extent pool for rank group 1.

Note: If this is the first time that the extent pools are created, the minimum number of extent pools does not already exist.

- Does each extent pool have a rank group that is assigned to it and are they balanced? If this is the first time, there will be no rank assignments.
- Are additional extent pools needed?

3. **Make your extent pools** by issuing the **mkextpool** command. (A minimum of two extent pools must be created. One for rank group 0 and one for rank group 1.)

Type the following command at the dscli command prompt:

```
dscli>mkextpool -dev IBM.1750-68FA120 -rankgrp 0 -stgtype ckd  
extent_pool_name  
dscli>mkextpool -dev IBM.1750-68FA120 -rankgrp 1 -stgtype ckd  
extent_pool_name
```

The *extent_pool_name* parameter is required with the **mkextpool** command. The extent pool name is a unique name that you assign to each extent pool and it cannot be longer than 16 characters.

Make additional extent pools for each of the following conditions:

- Each RAID type (5 or 10)
- Each disk drive module (DDM) size
- Each CKD volume type (3380, 3390)
- Each logical control unit (LCU) address group

4. **Press Enter.** A successful process displays the following message:

Note: The unique name that you assigned to the extent pool does not display in the process message. However, when you issue the **lsextpool** command, the extent pool name is displayed.

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-75FA120
```

```
Extent pool P1 successfully created.
```

5. **Repeat Step 2** for each extent pool that you want to create. Try to evenly distribute rank and extent pool allocations in order to keep the storage server workloads balanced.

6. **Verify the extent pool assignments** by issuing the **lsextpool** command when you are done making the extent pools. Use the **-l** parameter to display a full report for the extent pools that are assigned to the storage unit. Type the following command at the dscli command prompt:

```
dscli> lsextpool -dev IBM.1750-75FA120 -l
```

You might want to print this report because this list is used later during the process of creating CKD volumes.

Creating arrays for CKD volumes using the DS CLI

Complete this task to create arrays for CKD volumes using the DS CLI commands.

The machine type 1750 must contain at least one storage enclosure, with a minimum of four DDMs.

The DDMs of a storage enclosure are partitioned into array sites. A machine type 1750 array site consists of four DDMs in one storage enclosure of a storage

enclosure pair, with two to eight (four DDM) array sites per storage enclosure pair. All array sites of a storage enclosure pair have identical capacity, rpm, and interface characteristics, and an interface to a common DA pair.

The creation of arrays is based on the array sites that are associated with the storage unit. You must make an array from 1 or 2 array sites. An array inherits the characteristics of its parent array sites, and is given a RAID type attribute (5 or 10). A 1750 Array object of RAID type 5 or 10 is made from one or two (4 DDMs) array sites.

Note: The array status is “unassigned” until the array is assigned to a rank.

Use the **lsarraysite** and **mkarray** commands to create the arrays. You must be logged into the DS CLI application and connected to the storage unit that will be used for open systems host system storage.

Perform the following steps to create arrays for a CKD volume configuration:

1. Issue the **lsarraysite** command to find the unassigned array sites. Enter the **lsarraysite** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsarraysite -dev storage_image_ID -state unassigned
```

Note: If this is your first time creating volumes, you will see all the arrays with a state of “unassigned”.

2. Press Enter. A report of unassigned array sites is displayed. Use the list to identify unassigned array site capacity, rpm, and device adapter (DA) pair attributes. Record the RAID type for each array site.
3. Issue the **mkarray** command to create an array from each site with the status “unassigned”. Enter the **mkarray** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkarray -dev storage_image_ID -raidtype [5 | 10] -arsite array_site
```

Repeat this command until all unassigned array sites have been assigned to an array.

Notes:

- a. You can specify one or two array sites for RAID types 5 and 10. If there are two array sites, both sites must be associated with a common DA pair ID. Two array sites must be separated by commas with no blank space in between. Example: S10,S11.
- b. The new array site inherits the capacity, rpm, interface, and DA pair characteristics of its parent array sites. The state of the array is “unassigned” until it is assigned to a rank.

Creating a rank for CKD volumes using the DS CLI

Complete this task to create a rank for a CKD volume. A rank is a logically contiguous storage space that is made up of one or more arrays. You want to assign a rank to every unassigned array.

A rank inherits the characteristics, including RAID type, of its parent array and is given a storage type attribute FB (fixed block) or CKD (count key data). The rank configuration state is unassigned until it is assigned to an extent pool. An unassigned rank is not associated with either rank group 0 or 1. Any unassigned rank can be assigned to an extent pool that is associated with either rank group 0 or 1.

Note: You can assign a rank to an unassigned array and also assign the rank to an extent pool at the same time if you have already created the extent pools and the arrays. Creating extent pools first saves a step in the configuration.

Use the **lsarray**, **mkrank**, and **lsrank** commands to assign a rank to each unassigned array. You must be logged into the DS CLI application and be connected to the storage unit that will be used for open systems host system storage.

To make ranks, perform the following steps:

1. Issue the **lsarray** command to ensure you have a list of the unassigned arrays for which ranks must be assigned. Enter the **lsarray** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsarray -dev IBM.1750-68FA120 -state unassigned
```

2. Issue the **mkrank** command to assign a rank to rank group 0 or 1 according to the rank group number of the assigned extent pool ID. Enter the **mkrank** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkrank -dev IBM.1750-68FA120 -array A44  
-stgtype ckd -extpool P1
```

Notes:

- a. You can specify either the **-wait** or the **-extpool** parameter when you use the **mkrank** command. Either of these parameters allows you to be notified if the rank configuration has failed for any reason.
 - b. Be aware that when you use the **-wait** parameter, you cannot issue any other commands until the entire transaction has processed.
3. Press Enter to create the ranks.

The process of making the rank involves formatting drives. It can take a little time before the process finishes. To check on the process, issue the **lsrank** command from a different DS CLI session. A successful process generates the following type of message:

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Device: IBM.1750-68FA120

Rank IBM.1750-75FA120/R44 successfully created.
 4. Repeat Step 2 and step 3 until all unassigned arrays are assigned a rank and an extent pool.
 5. Issue the **lsrank** command to verify that ranks and extent pools have been assigned. Enter the **lsrank** command at the dscli command prompt with the following parameters and variables:

dscli>lsrank -dev IBM.1750-68FA120 -l
 6. Press Enter. A report of the rank assignments for your entire storage unit is displayed.

Creating logical control units for CKD volumes using DS CLI

The logical control unit (LCU) is the S/390 and zSeries host equivalent of the logical subsystem (LSS) for open systems hosts. The LCU must be defined (created) before CKD logical volumes can be created.

The DS6000 has a 16 384 volume address space that is partitioned into 64 logical subsystem (LSS) units, where each LSS contains 256 logical volume numbers. The 64 LSS units are assigned to one of 4 address groups, where each address group

contains 16 LSSs, or 4096 volume addresses. All of the LSSs in one address group must be of the same type (CKD or fixed block).

Typically, LCUs are created in groups of 16, beginning at LSS address X'x0'.

Use the **lsaddressgrp**, **mklcu**, and **lslcu** commands to create the LCU type logical subsystems. You must be logged into the DS CLI application and connected to the storage unit that will be used for open systems host system storage.

To create LCUs, perform the following steps:

1. Find unassigned and available address groups by issuing the **lsaddressgrp** command. To use the **lsaddressgrp** command, type the following at the dscli command prompt:

```
dscli>lsaddressgrp -dev IBM.1750-75FA120
```

This command displays a report on the status of the address groups within your storage unit.

2. Analyze the report to identify all of the address groups that are available to be defined. Use the following criteria:

- If the list is empty, all of the address groups are available to be defined.
- A defined address group with the storage type fb (fixed block) is not available to be defined.
- A defined address group with the storage type ckd and with fewer than 16 LSSs is available for LCU definition.
- If you are using an undefined address group to make new LCUs, select the lowest numbered address group that is not defined.
- If you are defining a new LCU in an existing CKD address group, use the **lslcu** command to identify LCUs that are already defined in the target address group.

3. Make the LCU logical subsystem objects by issuing the **mklcu** command. Type the command using the following format at the dscli command prompt:

```
dscli>mklcu -dev IBM.1750-75FA120 -qty 16 -id 00 -ss 0010 -lcutype 3390-3
```

In this example, the values specify the following:

qty

Specifies the number of LCU IDs to be created.

id Specifies the LCU ID to be created, or the first LCU ID in a sequence of LCU IDs to be created.

ss Specifies the subsystem ID that you have assigned. If multiple LCU IDs are being created, then the SSID value increments for each additional LCU ID that is created.

If 16 LCUs are created, starting with SSID 0x10, then the SSID values are 0x0010 – 0x001F.

lcutype

Specifies the type of LCU to be created. You can specify the following types:

- 3390-3
- 3990-tp
- 3990-6
- bs2000

4. Press Enter. A successful process displays a confirmation message listing each LCU ID number that has been successfully created.
5. Verify that the LCUs are recognized in the storage unit by issuing the **lslcu** command at the dscli command prompt as follows:

```
dscli>lslcu -dev IBM.1750-75FA120 -l
```

 Using the **-l** parameter displays a more detailed report for each LCU that is associated with your storage unit.

Creating count key data volumes using the DS CLI

Complete this task to create count key data (CKD) volumes.

A logical volume consists of one or more data extents that are allocated from a single extent pool. The volume data type is inherited from the extent pool extent storage type (fixed block or CKD) characteristic. When a CKD volume is created, volume attributes are further defined by a base or alias volume type, 3390 or 3380 volume cylinder type, and volume capacity in cylinders. These volume attributes characterize the volume to the host system that will eventually access the volume. Each volume is assigned a volume ID, which is the volume address within the 64 KB address space. Host access to a volume is enabled when the volume ID is assigned to a volume group; however, CKD volumes are automatically assigned to the volume group CKD FICON/ESCON All (ID V10).

Perform the following steps to create your CKD volumes:

1. View your list of CKD extent pool IDs and determine which extent pool IDs that you want to use as the source for the CKD volumes to be created. You obtained this list when you first created your extent pools. If this list is not available, you can issue the **lsextpool** command to obtain the list of extent pool IDs.

Extent pool attributes determine the size and quantity of volumes that can be created. The extent pool ID (even/odd) indicates the storage server (0|1), which dictates that the logical control unit (LCU) ID component of the volume ID must be an even or an odd number.

2. Issue the **mkckdvol** command to make 128 base volumes for each LCU. Enter the **mkckdvol** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkckdvol -dev IBM.1750-68FA120 -extpool p1 -cap 3339
-name finance#d 0000-007F
```

The following considerations affect the command example in this step:

- The **-extpool** parameter identifies a CKD extent pool that contains available data extents.
- The **-cap** parameter specifies the quantity of CKD cylinders that are allocated to this volume.
- The **-name** parameter allows you to assign an easy-to-use label or nickname to the volume. The volume name parameter can include a wild card (#d or #h) that inserts a decimal or hexadecimal volume ID value into the volume name.

Note: The decimal designation does not apply to the volume ID number or the number of volumes that were created by the command. It only applies to the unique name that you have assigned to the volume. When you process the **mkckdvol** command, the volume name that

you have assigned does not appear in the confirmation message. To view the volume name that you have assigned, issue the **lsckdvol** or **showckdvol** command.

- Volume ID 0000 - 007F specifies 128 volumes, starting at CKD address group (0), LCU ID (00), and volume number (00). You must specify volume IDs that have not been previously defined as CKD or fixed block volumes.
3. Press Enter to create the volumes. A confirmation message is displayed that lists the successful creation of each volume.
 4. Repeat Steps 2 and 3 until all required logical volumes for all LCUs have been created.
 5. Issue the **mkaliasvol** command to make 128 alias volumes for each LCU. Enter the **mkaliasvol** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkaliasvol -dev IBM.1750-68FA120 -base 0000-004F  
-order decrement -qty 2 00FF
```

Consider the following conditions with regard to the command example in this step:

- The **-base 0000 - 004F** parameter specifies that alias volumes are assigned to existing base volume IDs 0000 - 004F. Base and alias volumes must be associated with a common LCU ID.
 - The **-order** parameter specifies the order in which alias volume IDs are assigned.
 - The **-qty** parameter specifies the number of alias volumes that are assigned to each base volume.
 - The **volume ID (00FF)** parameter specifies that the alias volumes are assigned, starting at a CKD address group (0), LCU ID (00) and volume number (FF). You are responsible for specifying the volume ID values that have not been previously defined as CKD or fixed block volume types.
- As a result, alias volumes 00FF and 00FE are created for base volume 0000, 00FD and 00FC for 0001, and so on.
6. Repeat Step 5 until you have defined all required logical volumes for all the LCUs.
 7. Press Enter to create the alias volumes. A confirmation message is displayed that lists the successful creation of each volume.
 8. Issue the **lsckdvol** command to display a report that you can use to confirm the status of your CKD volumes. Enter the **lsckdvol** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsckdvol -dev IBM.1750-6800861 -l 1410
```

Note: It is possible that the report will display that there was a configuration error that is associated with one or more of your **mkckdvol** transactions. In the majority of instances, the only way to correct this error is to issue the **rmckdvol** command.

Correcting a CKD volume configuration error

Complete this task to correct a count key data (CKD) volume configuration error.

There might be occasions when you are using the **mkckdvol** command to create CKD volumes, but the transaction fails. You might not be aware of the failure until you run the **lsckdvol** or the **showckdvol** command to check the status of the volumes that you have created.

The **lsckdvol** or the **showckdvol** commands display reports that includes a *configstate* category. The configuration state category reports on the current state of the rank. One of the configuration state codes is **configuration error**.

A status of **configuration error** specifies that the configuration process did not complete successfully. This state reflects an internal error condition and is not an indication that there was a user input error.

You might want to gather additional information about what caused the error, which can help you determine how to correct it. Generally, to correct this error state, you must delete the designated volume configuration and submit a new transaction request.

Perform the following steps to obtain additional information about the configuration error and to correct this error condition.

1. Add the **-v** (verbose) command flag to your **mkckdvol** command and reissue the **mkckdvol** command for the transactions that show there is a configuration error.

Note: You can also turn on the verbose mode in your profile file and reissue the command.

If you designate the verbose mode, the display of extra output includes the error code that is generated when the create CKD volume transaction fails.

2. Issue the **rmckdvol** command to delete the designated volume configurations if you do not want to obtain additional information about what caused the configuration error.

Note: In the majority of instances, this is the only method for correcting a configuration error.

Configuring fibre-channel I/O ports using the DS CLI

Complete this task to configure fibre-channel I/O ports using the DS command-line interface.

Before you begin, you must have the command-line interface prompt, and you must be connected to a storage unit that will be used for open systems host system storage.

In this process, you must designate the topology for the I/O port. The following three topology settings are available:

fibre channel arbitrated loop (coded as *fc-al* in the *setioport* command)

Enables the SCSI ULP with a FC-AL topology. The FC-AL topology does not support PPRC path I/O operations.

SCSI-FCP (coded as *scsi-fcp* in the *setioport* command)

Enables the SCSI ULP with a point-to-point or switched fabric topology. PPRC path I/O operations are enabled for this setting.

Note: Designate this topology for System i systems using i5/OS level V5R3M5 and above.

ficon (coded as *ficon* in the *setioport* command)

Enables the FICON ULP with a point-to-point or switched fabric topology. PPRC path I/O operations are not supported for FICON ULP.

The storage unit supports the fibre-channel host adapter (HA) card type. For machine type 1750, one or two HA cards are installed in each of the two CEC assemblies. Use the **lsioport** and **setioport** commands to configure fibre-channel I/O ports.

Each fibre-channel HA card contains four I/O ports. The storage image microcode automatically creates one I/O port to represent each HA card I/O port. The default fibre-channel I/O port settings enable SCSI-FCP “identified” access to fixed block volumes. You might have to modify the I/O port settings to enable SCSI FC-AL access to fixed block volumes.

To configure the fibre-channel ports, perform the following steps:

1. View a list of fibre-channel port IDs by typing the following command format at the dscli command prompt:

```
dscli>lsioport -dev IBM.1750-75FA120 -l -type fc
```

A detailed report is displayed that lists the fibre-channel I/O ports.

2. Analyze the report and determine which I/O port IDs that you want to access the fixed block volumes.

Configure a minimum of four I/O ports for SCSI host I/O operations. Select ports with physical locations on different host bus adapter (HA) cards. If possible, locate the HA cards in different I/O enclosures.

3. Set the I/O ports that you have identified to enable the FC-AL (fibre-channel arbitrated loop), SCSI-FCP, or FICON topology. The following example shows how to enable the FC-AL topology by typing the following command format at the dscli command prompt:

Note: I/O ports are automatically set to the offline state and returned to the online state after configuration changes are applied.

```
dscli>setioport -dev IBM.1750-75FA120 -topology fc-al  
0012 0013 0112 0113
```

4. Press Enter. A successful process returns a confirmation message indicating that the port IDs have been successfully configured.

Managing your logical storage configuration

The topics in this section provide task information that are related to working with configuration files after the initial creation of the configuration. This information is for working with the commands associated with the DS CLI application.

Using DS CLI commands on i5/OS

Complete this task to use DS CLI commands from the “green screen” interface on i5/OS®.

Before you can use the DS CLI on i5/OS, ensure that the following conditions have been met:

- You have installed the DS CLI code on i5/OS.

The DS CLI is installed on the i5/OS integrated file system (IFS) in the following two places:

- IFS directory IBM/DSCLI, which contains the profiles, executable files, and readme files.
- The library QDSCLI, which contains executable code.

- You have added library QDSCLI to the i5/OS library list by performing the following process:
 1. Enter WRKSYSVAL QUSRLIBL at the i5/OS command line.
 2. Press Enter and select option number 2.
 3. Add the QDSCLI library into the lib list.
- You have completed the initial configuration from the server from which you did your installation. For example, you have activated your licenses, created your arrays, ranks, extent pools, host attachments, and logical volumes on the DS6000.
- You have configured the DS CLI profile as appropriate. To edit the profile file, perform the following:
 1. Enter EDTF '/ibm/dscli/profile/dscli.profile' at the i5/OS command line.
 2. Update the following two lines when the profile file displays:
 - HMC IP address field and remove the comment from this command line
 - Dev ID field and remove the comment from this command line
- You have performed an IPL to System i™.

Assuming that you have met the previous conditions, perform the following steps using DS CLI on i5/OS to process storage configuration and Copy Services functions on the DS6000:

1. **From the i5/OS main menu, enter DSCLI at the prompt to start DS CLI on i5/OS and press Enter.**

```

MAIN                                OS/400 Main Menu                System: IBMSYSTEM
Select one of the following:
1. User tasks
2. Office tasks
3. General system tasks
4. Files, libraries, and folders
5. Programming
6. Communications
7. Define or change the system
8. Problem handling
9. Display a menu
10. Information Assistant options
11. iSeries Access tasks
90. Sign off
Selection or command
===> dscli
F3=Exit   F4=Prompt  F9=Retrieve   F12=Cancel   F13=Information Assistant
F23=Set initial menu
  
```

2. **The DSCLI displays the following screen where you can specify a DS CLI script for DS CLI commands and a DS CLI profile.** In this example, a default profile is specified. The profile is not configured so the value of *DEFAULT is used. If you are not using a script, specify *None and press Enter.
After you press Enter, more fields appear in the screen as shown in step 3 on page 90.


```

Run DSCLI Functions (DSCLI)

Type choices, press Enter.

Script: *NONE or name . . . . . *NONE__
Profile . . . . . *DEFAULT

F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys

```

3. Specify the values, as appropriate and press Enter.

```

Run DSCLI Functions (DSCLI)

Type choices, press Enter.

Script: *NONE or name . . . . . > *NONE
Profile . . . . . *DEFAULT

HMC1 . . . . . *PROFILE
HMC2 . . . . . *PROFILE
User . . . . . admin
Password . . . . .
Install Path . . . . . '/ibm/dscli'
DSCLI CMD . . . . . *int

F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys

```

Bottom

Consider the following fields and values:

- If you are using a DS CLI script for DS CLI commands, enter the name in the Script field. Otherwise, specify ***None**.
- If you use default profile, leave the value ***DEFAULT** in the field Profile. If you use another file as a profile, specify the name and path of this file in the field Profile.
- Enter the hardware management console (also known as the management console) user in the User field. Typically, it is Admin.
- Enter the password of the user (typically the administrator's password).
- Enter ***INT** (for interactive session) in the DSCLI CMD field.

The screen shown in step 4 displays.

4. Specify the DS CLI commands to invoke storage configuration or Copy Services functions.

```

Date/Time: July 8, 2005 2:55:20 PM MST IBM DSCLI Version: 5.0.4.32 DS:
IBM.1750-13ABVDA

dscli>
===>
F3=Exit   F6=Print   F9=Retrieve   F12=Exit F13=Clear F17=Top F18=Bottom
F21=CL command entry

```


Modifying an extent pool

Complete this task to modify the properties of an extent pool using the DS CLI application.

Use the **chextpool** command to modify the properties of an extent pool. You can modify the following extent pool properties:

- name of the extent pool
- extent limit on or off indicator
- extent limit percentage
- extent threshold percentage

Perform the following steps to modify the extent pool properties.

1. Issue the **lsxtpool** command to generate a report that identifies the status of your extent pools by storage type (fixed block or count key data). Enter the **lsxtpool** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsxtpool -dev storage_image_ID -l -stgtype (fb | ckd)
```

Note: The **-stgtype** parameter must be designated as either **fb** (fixed block) or **ckd** (count key data). The storage type allows you to limit the list of extent pools for issues such as which ones to rename or to change the limit or threshold percentages.

2. Issue the **chextpool** command to change the name that is assigned to the extent pool or to change the percentages that are allocated for extent and threshold limits. Enter the **chextpool** command at the dscli command prompt with the following parameters and variables:

```
dscli>chextpool -dev storage_image_ID -name new_extent_pool_name  
-extentlimit [on | off] -limit extent_limit_percentage  
-threshold extent_threshold_percentage -extentpool_ID
```

Notes:

- a. The new extent pool name can include up to sixteen characters.
 - b. The **-extentpool_ID** parameter is required but does not need to be specified as a separate entry. You can add it to the **storage_image_ID** parameter. For example: IBM.1750-68FA120/P21, with P21 being the extent pool ID. Extent pool IDs are specified as 4-digit values with no leading zeros, and they are preceded by the letter P.
 - c. The unique name that you assigned to the extent pool does not display in the output message of the **chextpool** command. However, when you issue the **lsxtpool** command, the extent pool name is displayed.
3. Issue the **lsxtpool** command to verify that your changes have been processed.

Viewing extent pool status

Complete this task to display a list of extent pools in a storage unit and status information on each extent pool in the list.

Issue the **lsxtpool** command if you want to view the unique names that you have assigned to your extent pools or if you want to view general status information about the extent pools in your storage unit. If you want to view the details or properties that are associated with your extent pools or if you want to view the performance metrics, issue the **showextpool** command.

Perform the following step to display a list of extent pools and their status in a storage unit.

Issue the **lsxtpool** command to display the extent pool list and status information. Enter the **lsxtpool** command at the dscli command line prompt with the following parameters and variables:

```
dscli>lsxtpool -dev storage_image_ID -l
```

Notes:

1. Use the **-l** parameter if you want to see the list and status for all the extent pools (fixed block and CKD) in your storage unit. A full report is displayed.
2. Use the **-s** parameter if you just want to see only a list of the extent pools in your storage unit. No additional information is provided.

Viewing extent pool properties and performance metrics

Complete this task to display the detailed properties for the list of extent pools in a storage unit and to view the performance metrics status information on each extent pool in the list.

You must know and use an extent pool ID that resides in your storage unit. You can obtain these IDs by issuing the **lsxtpool** command.

Issue the **showxtpool** command when you want to view the details of the properties that are associated with an extent pool or when you want to view the performance metrics for an extent pool in your storage unit.

Perform the following steps to display the detailed properties of an extent pool or to display the performance metrics of an extent pool.

1. (For detailed properties information) Issue the **showxtpool** command. Enter the **showxtpool** command at the dscli command-line prompt with the following parameters and variables:

```
dscli>showxtpool -dev storage_image_ID extentpool_ID
```
2. (For performance metrics information) Issue the **showxtpool** command. Enter the **showxtpool** at the dscli command-line prompt with the following parameters and variables:

```
dscli>showxtpool -dev storage_image_ID -metrics extentpool_ID
```

Notes:

- a. All performance metrics are an accumulation since the most recent counter wrap or counter reset.
- b. The extent pool performance counters are reset on the following occurrences:
 - When the storage unit is turned on.
 - When a server has failed, and the failover and failback sequence is performed.

Deleting extent pools from a storage configuration

Complete this task to remove one or more extent pools from a storage configuration.

When you are using the DS CLI to delete extent pools as part of a storage configuration deletion, the following sequential deletions must have already occurred:

- The volumes associated with the extent pool must be removed.
- (CKD volume configuration only) The logical control units (LCUs) that are associated with the extent pool must be removed.
- The ranks that are assigned to the extent pool must be unassigned or removed.
- The arrays that are assigned to the extent pool must be removed.

To delete an extent pool or a number of extent pools, you must first generate a list of extent pool IDs by storage type (fixed block or CKD) by issuing the **lsxtpool** command. After you determine which extent pools can be deleted, you can issue the **rmxtpool** command that designates the extent pools that you want to delete.

Perform the following steps to delete one or more extent pools from a fixed block volume configuration.

1. Issue the **lsxtpool** command to display a list of extent pools. Ensure that you designate the storage type within your command parameters. Enter the **lsxtpool** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsxtpool -dev storage_image_ID -l -stgtype [fb | ckd]
```

2. Analyze the list and determine which extent pools can be deleted.
3. Issue the **rmxtpool** command to delete the designated extent pools. Enter the **rmxtpool** command at the dscli command prompt with the following parameters and variables:

```
dscli>rmxtpool -dev storage_image_ID extentpool_ID
```

Note: If you are deleting several extent pools, you can add the **-quiet** parameter to your command. This parameter turns off the confirmation message that is generated for each deletion transaction.

4. Issue the **lsxtpool** command after the deletion processing has completed to verify that the extent pools have been deleted.

Viewing the array disk drive module status

Complete this task to view the status of an array disk drive module (DDM) using DS CLI commands.

The machine type 1750 contains at least one storage enclosure, with a minimum of four DDMs.

The DDMs of a storage enclosure are partitioned into array sites. A machine type 1750 array site consists of four DDMs in one storage enclosure of a storage enclosure pair, with two-to-eight (four DDM) array sites per storage enclosure pair. All array sites of a storage enclosure pair have identical capacity, rpm, and interface characteristics, and an interface to a common DA pair.

The DDMs of a storage enclosure are partitioned into array sites. The creation of arrays is based on the array sites that are associated with the storage unit. Before and after creating an array you might want to check on the status of the DDMs.

Perform the following steps to view the DDM status:

1. Issue the **lsddm** command to obtain a list and status of the DDMs currently associated with the storage unit. Enter the **lsddm** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsddm -l storage_image_ID
```
2. Issue the **showarraysite** command after you have created an array using the DDMs. Enter the **showarraysite** command at the dscli command prompt with the following parameters and variables:

```
dscli>showarraysite storage_image_ID -fullid site_ID
```

Notes:

- a. The storage image ID is optional. You do not have to specify it but, if you choose not to use it, you need to provide a fully qualified *site_ID* which includes the manufacture, model type, and serial number information.
- b. The *site-ID* parameter is a four-digit number preceded by the letter "S" with no leading zeros.
- c. The **-showarraysite** command provides the following DDM information that is associated with the DDM after the array has been created:
 - DDM serial number
 - Spares - Identifies, if any, the number of spare DDMs that are allocated from the array site.
 - Data DDM - Specifies the number of data DDMs. This value is based on the number of DDMs minus the number of spares.

Viewing array status

Complete this task to view the status of all arrays that are associated with a storage unit using DS CLI commands.

The steps in this task presume that you have already created your arrays from the array sites.

The creation of arrays is based on the array sites that are associated with the storage unit. After you have created your arrays, there might be times when you want to view the status of the array sites and the associated arrays.

Perform the following steps to view the status of all the array sites and arrays that are associated with the storage unit.

1. Issue the **lsarraysite** command to generate a list of all the array sites and their status. Enter the **lsarraysite** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsarraysite -dev storage_image_ID -l
```

The state column of the report might be of interest as it specifies the following state of the array site and conditions that require attention:

- Assigned - The array site has been defined as an array.
- Unassigned - The array site is available to be defined as an array.
- Unavailable - Specifies that the designated array site is unassigned and at least one disk is not in the normal state. Also, the array site is not in the initializing state.
- Initializing - Specifies that the array site is unassigned and all disks are either in the normal or initializing state. Also, at least one disk is in the initializing state.

2. Issue the **lsarray** command to generate a list of all the arrays and their status. Enter the **lsarray** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsarray -dev storage_image_ID -l
```

Note: You might want to analyze the state and data column information for the arrays. Some of the reported conditions require further action. See the **lsarray** command for additional information.

Viewing properties for one array

Complete this task to view the detailed properties of one array and the array site that is associated with a storage unit using DS CLI commands.

The steps in this task presume that you have created your arrays.

The creation of arrays is based on the array sites that are associated with the storage unit. After you have created your arrays, there might be times when you want to view the status of an array site and the associated array.

Note: For your 1750 machine type, you might have created your array from one or two array sites. An array inherits the characteristics of its parent array sites and is given a RAID type attribute (5 or 10).

Perform the following steps to view the status of the array site or sites and the array that is associated with the storage unit.

1. Issue the **showarraysite** command to generate a report that displays the array site or sites and their status. Enter the **showarraysite** command at the dscli command prompt with the following parameters and variables:

```
dscli>showarraysite -dev storage_image_ID site_ID
```

Notes:

- a. The site ID is a four-digit number that is preceded by the letter S with no leading zeros.
 - b. The site ID does not specify a physical location. It is, however, an identifier for the array site ID.
 - c. The array site state shows a value of **assigned** if you have created the array.
2. Issue the **showarray** command to generate the properties report for the specified array. Enter the **showarray** command at the dscli command prompt with the following parameters and variables:

```
dscli>showarray -dev storage_image_ID array_ID
```

Removing arrays from a storage configuration or a rank assignment

Complete this task to remove an array or a range of arrays from a storage configuration using the DS CLI.

When the array or arrays are deleted as part of deleting a storage configuration and you are using DS CLI to delete the configuration, the following sequential deletions must have already occurred:

- Host access to the volumes of the configuration must have been removed. (Does not apply to a CKD configuration.)

- The associated volume groups must have been removed. (Does not apply to a CKD configuration.)
- The fixed block or CKD volumes that are part of the configuration must have been removed.
- The LCUs (if you are removing a CKD configuration) must have been removed.
- The ranks must have been removed.

There might be times when you want to remove arrays from a storage configuration or from a rank assignment. You can avoid errors when you use the DS CLI by ensuring that the arrays are ready for removal. The arrays must have a status of "unassigned" before they can be removed or be reassigned to another rank.

When you remove a rank using the DS CLI, there is an extended period of processing because the array is unassigned from the rank and the drives are formatted. During this processing, the array is still shown with a status of assigned, even though you have received a confirmation message that the rank has been removed. The status for the array does not change to "unassigned" until after the array has been formatted.

Perform the following steps to remove arrays from a storage configuration or a rank:

1. Issue the **lsarray** command to obtain a list of array IDs to be removed. Enter the **lsarray** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsarray -dev storage_image_ID -state unassigned
```

Notes:

- a. You might have to issue the **lsarray** command several times before you observe that the arrays are in a state that allows them to be removed or reassigned.
 - b. Specify the **-state unassigned** parameter to narrow your list to just the array IDs that are not assigned to a rank ID.
 - c. If you issue the **lsarray** command without using the **-state unassigned** parameter, you might see a list of arrays that have a state of unavailable. This is generally a good indication that the ranks have not been removed and that the arrays are still formatting. You must wait until the ranks have been removed and the arrays have been formatted before you can proceed.
 - d. Proceed to the next step (remove arrays) only after all the arrays that you want to remove or reassign are displayed with a state of unassigned.
2. Issue the **rmarray** command to delete the unassigned arrays so that the array sites can be redefined as new arrays. Enter the **rmarray** command at the dscli command prompt with the following parameters and variables:

```
dscli>rmarray -dev storage_image_ID array_ID
```

Notes:

- a. You can remove one or many arrays as long as you designate the range of arrays using a hyphen and separate each range of arrays or a single array with a space before the next array designation. For example, A44-A48 A51 designates a range of arrays and a single array.

- b. If you are removing several arrays, you might want to designate the **-quiet** parameter in your command. This parameter turns off the deletion confirmation message that is generated after each array is deleted.

Adding a rank to an extent pool

Complete this task to add an unassigned rank to an extent pool using the DS CLI.

To add a rank to an extent pool, the rank must have a data state designation of normal and a configuration state designation of unassigned.

A rank is a logically contiguous storage space made up of one or more arrays. An unassigned rank is not associated with either rank group 0 or 1. Any unassigned rank can be assigned to an extent pool that is associated with either rank group 0 or 1. Over time, you might remove a rank from an array and extent pool without deleting the rank. When a rank is removed and not deleted, it retains its storage type designation of fixed block or CKD. This designation cannot be changed.

Perform the following steps to add a rank to an extent pool:

1. Issue the **lsrank** command to generate a report that lists the status of the ranks that are associated with the storage unit. Enter the **lsrank** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsrank -dev storage_unit_ID -l -state unassigned
```

Notes:

- a. The report that is generated by this example provides a list of all unassigned ranks; however, the storage type is mixed between fixed block and CKD.
 - b. You can narrow your report information to a specific storage type by adding the **-stgtype** [fb | ckd] parameter to your command.
2. Issue the **chrank** command to add (reassign) a rank or ranks to an extent pool. Enter the **chrank** command at the dscli command prompt with the following parameters and variables:

```
dscli>chrank -dev storage_image_ID -extpool extentpool_ID rank_ID
```

Notes:

- a. The rank ID is a 4-digit number with the prefix *R* and with no leading zeros. You can specify a range of rank IDs by using a hyphen between the beginning and ending values of the range. For example: R102-R105
- b. You can specify multiple rank IDs or rank ID ranges, but you must leave a space between each designation. For example: R102 R105 R107-R109

Modifying a rank

Complete this task to modify a rank using the DS CLI

You can perform the following modifications to a rank using the DS CLI commands:

- Designate that the rank be given a reserved status.
- Release a rank from a reserved status.

- Designate that the rank be removed (but not deleted) from its current extent pool and array assignment and be designated as unassigned.
- Designate that the rank be assigned to an extent pool.

Perform the following steps to modify a rank using DS CLI commands:

1. Issue the **lsrank** command to generate a report that lists the status of the ranks that are associated with the storage unit. Enter the **lsrank** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsrank -dev storage_unit_ID -l
```

Notes:

- a. The report that is generated by this example provides a list of all ranks; however, the storage type is mixed between fixed block and CKD.
 - b. You can narrow your report information to a specific storage type by adding the **-stgtype** [fb | ckd] parameter to your command.
2. Use the report to determine the rank or ranks you want to modify. The report contains details about the ranks that you must use to issue the **chrank** command for modifications.
 3. Issue the **chrank** command to implement one of the following types of modifications:

- a. To designate a rank as reserved, enter the **chrank** command at the dscli command prompt with the following parameters and variables:

```
dscli>chrank -dev storage_image_ID -reserve rank_ID
```

Changing the rank configuration state to "reserved" designates that the extents that are associated with the rank are not eligible for allocation to a logical volume. However, the existing allocations remain in effect until the configuration state is changed to normal. In other words, the characteristics that the rank inherited from its parent array when it was originally assigned remain intact.

Notes:

- 1) You can specify a range of rank IDs or multiple rank IDs as long as you match the command usage criteria.
 - 2) You cannot change the configuration state of a reserved rank to "unassigned" without first releasing it.
- b. To release a rank from its reserved configuration state, enter the **chrank** command at the dscli command prompt with the following parameters and variables:

```
dscli>chrank -dev storage_image_ID -release rank_ID
```

When a rank is released from the configuration state of "reserved", it is designated with a configuration state of "normal".

- c. To remove a rank from its current extent pool and array assignment but not delete it, enter the **chrank** command at the dscli command prompt with the following parameters and variables:

```
dscli>chrank -dev storage_image_ID -unassign rank_ID
```

Notes:

- 1) A rank must have a configuration state of *normal* before it can be changed to a configuration state of *unassigned*.

- 2) A rank that is unassigned can be assigned to an array and extent pool of another storage configuration as long as the storage type is compatible: all fixed block or all CKD.

Viewing rank status

Complete this task to view the status of all the ranks that are associated with a storage unit using DS CLI commands.

After you have created your ranks, there might be times when you want to view the status of all the ranks that are associated with your storage unit. Using the parameters that are associated with the **lsrank** command, you can refine your search to specific rank criteria such as:

- Storage type (fixed block or CKD)
- Data state
- Configuration state
- RAID type

Perform the following step to view the status of all the ranks that are associated with the storage unit.

Issue the **lsrank** command to generate a list of all the ranks and their status. Enter the **lsrank** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsrank -dev storage_image_ID -l
```

The state and datastate column information for the ranks contains reported conditions that can require further action. See the **lsrank** command for an explanation of the action designations.

Viewing properties for one rank

Complete this task to view the detailed properties of one rank that is associated with a storage unit using DS CLI commands.

A rank is a logically contiguous storage space that is made up of one array. After you have created your ranks, there might be times when you want to view the status of an individual rank.

Perform the following steps to view the status of a rank that is associated with the storage unit.

Issue the **showrank** command to generate the properties report for the specified rank. Enter the **showrank** command at the dscli command prompt with the following parameters and variables:

```
dscli>showrank -dev storage_image_ID rank_ID
```

Notes:

1. Because the **showrank** command requires the use of a specific rank ID, you can issue the **lsrank** command first to obtain the specific rank IDs.
2. The state and datastate column information for the ranks contains reported conditions that can require further action. See the **showrank** command for an explanation of the action designations.

Correcting a rank-related configuration error

Complete this task to correct a rank-related configuration error.

There might be occasions when you are using the **mkrank** command to create ranks, but the transaction fails. You might not be aware of the failure until you run the **lsrank** or **showrank** command to check the status of the ranks that you have created.

The **lsrank** or the **showrank** commands display reports that includes a *state* category. The state category reports on the current state of the rank. One of the state codes is **configuration error**.

A state of **configuration error** specifies that a rank configuration process has not completed successfully. This state reflects an internal error condition and is not an indication that there was a user input error.

You might want to gather additional information about what caused the error, which can help you determine how to correct it. Generally, to correct this error state, you must delete the designated rank configuration and submit a new transaction request.

Perform the following steps to obtain additional information about the configuration error and to correct this error condition.

1. Obtain additional information about the transaction by implementing one of the following methods:

- Add the **-v** (verbose) command flag to your **mkrank** command and reissue the command for the transactions that show the configuration error designation.

Note: You can also turn on the verbose mode in your profile file and reissue the command.

Designating the verbose mode allows the display of extra output that includes the error code that is generated when the create rank transaction fails.

- Add the **-extpool** parameter to your **mkrank** command and reissue the command for the transactions that show the configuration error.

You might consider using this parameter if you have not yet assigned your ranks to the extent pools. If the transaction fails, a message states the reason for a failure.

2. Issue the **rmrank** command to delete the designated rank configurations if you do not want to obtain additional information about what caused the configuration error.

Note: In the majority of instances, this is the only method for correcting a configuration error.

Removing ranks from a storage configuration

Complete this task to remove ranks from a storage configuration using the DS CLI.

When you are using the DS CLI to delete ranks as part of a storage configuration deletion, the following sequential deletions must have already occurred:

- Host access to the volumes of the configuration must have been removed. (Does not apply to a CKD configuration.)

- The associated volume groups must have been removed. (Does not apply to a CKD configuration.)
- The fixed block or CKD volumes that are part of the configuration must have been removed.
- The LCUs (if you are removing a CKD configuration) must have been removed.

When you remove ranks using the DS CLI, there is an extended period of processing because the arrays and extent pools are unassigned from the ranks and the drives are formatted. During this processing, the arrays and extent pools are still shown with a status of assigned, even though you receive a confirmation message each time a rank has been deleted. The status for the arrays and extent pools do not change to "unassigned" until after the drives have been formatted.

Perform the following steps to remove ranks from a storage configuration:

1. Issue the **lsrank** command to obtain a list of the ranks that are associated with the storage configuration that is being deleted. Enter the **lsrank** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsrank -dev storage_image_ID -l -stgtype [fb | ckd]
```
2. Look at the list and ensure that the ranks are in a state that allows them to be deleted. All the ranks need to have a data and configuration state of normal.
3. Issue the **rmrank** command to delete the ranks from the storage configuration. Enter the **rmrank** command at the dscli command prompt with the following parameters and variables:

```
dscli>rmrank -dev storage_image_ID rank_ID
```

Notes:

- a. If you have multiple ranks that are being deleted, you might want to include the **-quiet** parameter in your command. This parameter suppresses the confirmation message that is issued for each rank that is deleted.
- b. Deleting a rank or many ranks is a lengthy process because the array and extent pool assignments are unassigned and the disk drives are formatted.

When a rank is unassigned from the array and extent pool, a confirmation messages is issued that indicates that the rank has been deleted. However, because of the formatting, the process is not complete. You cannot initiate any action on the arrays or extent pools until the formatting is completed.

Modifying a logical control unit

Complete this task to modify a logical control unit (LCU) using the DS CLI.

You can perform the following modifications to an LCU using the DS CLI commands:

- Change the subsystem ID to ensure it retains its unique identity
- Change the system behavior so that it emulates an LCU type that allows your system to process DS CLI transactions
- Change the behavior of consistency group creation
- Change the system behavior for processing concurrent copy transactions

Perform the following steps to modify an LCU using DS CLI commands:

1. Issue the **lslcu** command to generate a report that lists the status of the LCUs that are associated with the storage unit. Enter the **lslcu** command at the dscli command prompt with the following parameters and variables:

```
dscli>lslcu -dev storage_unit_ID -l
```

2. Use the report to determine the LCU or LCUs that you want to modify. The report contains details about the LCUs that you must use to issue the **chlcu** command for modifications.
3. Issue the **chlcu** command to implement one of the following types of modifications:

- a. To maintain the unique identity that is associated with your logical subsystem within your Copy Services domain, you can change your subsystem ID (SSID). Enter the **chlcu** command at the dscli command prompt with the following parameters and variables:

```
dscli>chlcu -dev storage_image_ID -ss new_ss_ID lcu_ID
```

Note: The new SSID that you specify replaces the existing SSID value in the initial target LCU ID.

- b. To provide your system a format that allows you to process DS CLI transactions. Enter the **chlcu** command at the dscli command prompt with the following parameters and variables:

```
dscli>chlsu -dev storage_image_ID -lcutype [3990-3 | 3990-tpf |  
3990-6 | bs2000] lcu_ID
```

Notes:

- 1) The target LCUs are changed to the LCU type that you designate
- 2) When you designate multiple LCUs, separate multiple IDs and multiple ID ranges with a space. Separate your LCU range with a dash (-) between the first and last number of the range.
- c. To modify the concurrent copy timeout value using the **chlcu** command, see “Modifying the Concurrent Copy timeout value” on page 128.
- d. To modify the consistency group timeout value, see “Modifying the consistency group timeout value” on page 128.
- e. To modify the critical mode (Administrator authority only), see “Modifying the critical mode setting” on page 129.

Viewing logical control unit status

Complete this task to view the status of all the logical control units (LCUs) that are associated with a storage unit using DS CLI commands.

After you have created your LCUs, there might be times when you want to view the status of all the LCUs that are associated with your storage unit. Using the parameters that are associated with the **lslcu** command, you can refine your search to the following specific LCU criteria:

- Address group
- Specific LCUs or multiple LCUs

Perform the following step to view the status of all the LCUs that are associated with the storage unit.

Issue the **lslcu** command to generate a list of all the LCUs and their status. Enter the **lslcu** command at the dscli command prompt with the following parameters and variables:

```
dscli>lslcu -dev storage_image_ID -l
```

Notes:

1. Issue the **lsaddressgrp** command first if you decide to refine your search to include just the LCUs that are associated with a specific address group. The **lsaddressgrp** command provides a list of address groups that you can then use with the **-addrgrp** parameter of the **lslcu** command.
2. To specify a range of LCU IDs, separate the LCU IDs with a dash (-). You must separate multiple LCU IDs or ranges of LCU IDs with a blank space between each ID or range of IDs.

Viewing properties for one logical control unit

Complete this task to view the detailed properties of one logical control unit (LCU) that is associated with a storage unit using DS CLI commands.

An LCU represents a logical subsystem for zSeries hosts.

The DS6000 has a 16 384 volume address space that is partitioned into 64 logical subsystem (LSS) units, where each LSS contains 256 logical volume numbers. The 64 LSS units are assigned to one of 4 address groups, where each address group contains 16 LSSs, or 4096 volume addresses. All of the LSSs in one address group must be of the same type (CKD or fixed block).

Because you can modify some of the properties of an LCU, there might times when you want to examine the associated properties. The **showlcu** command allows you to view the properties of a single LCU.

Perform the following step to view the properties of a single LCU:

Issue the **showlcu** command to view a report that displays the properties of a single LCU. Enter the **showlcu** command at the dscli command prompt with the following parameters and variables:

```
dscli>showlcu -dev storage_image_ID LCU_ID
```

Note: The LCU ID is a 2-digit hexadecimal number in the range of 00 - 1F.

Removing logical control units from a CKD storage configuration

Complete this task to remove all logical control units (LCUs) from a CKD storage configuration using the DS CLI.

When you are using the DS CLI to delete LCUs as part of a storage configuration deletion, the following sequential deletions must have occurred:

- The alias CKD volumes that are part of the configuration must have been removed
- The CKD volumes that are part of the configuration must have been removed

Perform the following steps to remove LCUs from a CKD storage configuration:

1. Issue the **lslcu** command to obtain a list of the LCUs that are associated with the storage configuration that is being deleted. Enter the **lslcu** command at the dscli command prompt with the following parameters and variables:

```
dscli>lslcu -dev storage_image_ID -l
```

2. Look at the list to ensure that the LCUs are in a state to be removed. They are ready if there are no volumes that are assigned to the LCU (zeros are displayed for each LCU in the Confgvols column of the list).
3. Issue the **rmlcu** command to delete the LCUs from the storage configuration. Enter the **rmlcu** command at the dscli command prompt with the following parameters and variables:

```
dscli>rmlcu -dev storage_image_ID lcu_ID
```

Notes:

- a. If you have multiple LCUs that are being deleted, you can include the **-quiet** parameter in your command. This parameter suppresses the confirmation message that is issued for each LCU that is deleted.
- b. You must separate multiple LCU IDs or ranges of LCU IDs with a blank space between each ID or range of IDs. Each range of LCU IDs must be separated by a dash (-) between the first ID and the last ID of the range.

Chapter 9. Copy Services functions

This topic provides information about how to use DS CLI commands to perform the Copy Services tasks associated with FlashCopy, Metro Mirror, Path establishment, and Global Mirror transactions.

FlashCopy functions

This topic provides a list of tasks that help you create, monitor, and manage your FlashCopy operations using DS CLI commands.

Creating a FlashCopy relationship

Complete this task to create a FlashCopy® relationship between a source and target volume that enables a point-in-time copy of a source volume onto a target volume.

You can create a FlashCopy relationship between a source and a target volume that enables a point-in-time copy of a source volume onto a target volume. FlashCopy functions run on the DS6000 storage units and are supported on many operating systems. For example, if you set up and configure your DS6000 to use i5/OS, you can create copies of System i™ disk pools within a single DS6000 using FlashCopy. After the FlashCopy function completes, you can immediately access the target point-in-time copies by associating another System i or logical partition.

When you issue a FlashCopy command with the background copy option, the FlashCopy relationship is established but it is put in a queue for background copying. The time difference between the submission and actual start time of the task depends on the number of FlashCopy relationships that are currently copying in the background or waiting in the queue. When the copy processing starts, the status displays as "background copy running" for that FlashCopy volume pair.

How long the actual physical copy processing takes can depend on the amount of data being copied and other activities that are occurring on the storage unit.

You can complete this task using either the DS CLI or the DS Storage Manager.

Perform the following steps to create FlashCopy relationships using the DS CLI commands. The example commands in this task are shown in two formats. The first format shows the type of information the command requires. The second format is an example command with declared values for the variables.

1. Issue the **mkflash** command to create FlashCopy relationships. Enter the **mkflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkflash -dev storage_image_ID sourcevolumeID:targetvolumeID
```

Example

```
dscli>mkflash -dev IBM.1750-68FA150 0001:0004
```

Notes:

- a. Specify the storage unit for the **-dev storage_image_ID** parameter. This parameter is required if you do not specify a fully qualified ID for the source and target volumes and you do not specify a value for the devid variable in your profile file. If the management console

has an IP connection to the specified storage unit, the command works. If the IP connection is not established, you can use the **mkremoteflash** command if there is a PPRC Path established between the storage unit from which you issue the command and the (remote) storage unit where the FlashCopy volumes are located.

- b. For further information, including optional parameters, see the **mkflash** and **mkremoteflash** commands.

A confirmation message is issued for each successful FlashCopy pair that is created.

2. Issue the **lsflash** command to check the status information for each FlashCopy relationship. A detailed report (when you use the **-l** parameter) is displayed for each FlashCopy relationship. Enter the **lsflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsflash -dev storage_image_ID -l SourceVolumeID:TargetVolumeID.
```

```
dscli>lsflash -dev IBM.1750-68FA150 -l 0100:0100
```

Use the **-l** parameter to provide a more detailed report about the FlashCopy relationships.

Note: If you used the **mkremoteflash** command, you must enter the **lsremoteflash** command to perform a status check.

Creating a persistent FlashCopy relationship

Complete this task to create a persistent FlashCopy relationship that remains even after the FlashCopy operation completes.

Creating a persistent FlashCopy relationship prevents another FlashCopy task from writing to your target volume before you have deleted the FlashCopy relationship.

You can perform this task using either the DS CLI or the DS Storage Manager.

Perform the following step to create a persistent FlashCopy relationship. The example commands in this task are shown in two formats. The first format shows the type of information the command requires. The second format is an example command with declared values for the variables.

Issue the “mkflash” on page 396 command with the **persist** parameter to create a persistent FlashCopy relationship. Enter the **mkflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkflash -dev storage_image_ID -persist sourcevolumeID:targetvolumeID
```

Example

```
dscli>mkflash -dev IBM.1750-1337370 -persist 0000:1300
```

The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0  
DS: IBM.1750-1337370
```

FlashCopy pair 0000:1300 successfully created.

Viewing information about FlashCopy relationships

Complete this task to view status information about each existing FlashCopy relationship.

You can perform this task using either the DS CLI or the DS Storage Manager.

Perform the following step to view status information about existing FlashCopy relationships using DS CLI commands. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format is an example command with declared values for the variables.

Issue the **lsflash** command to provide a report that lists the FlashCopy relationships and status information for each FlashCopy relationship in the list. Enter the **lsflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsflash -dev storage_image_ID -l source_volume_ID:target_volume_ID
```

Example

```
dscli>lsflash -dev IBM.1750-68FA150 -l 0100:0200  
0101:0201 0102:0202 0103:0203
```

The resulting output

Note: The following tables display the output that is associated with the **lsflash** command using the **-l** parameter. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the machine type designation, 2107 versus 1750.

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.2107-75FA120

ID	SrcLSS	Sequence Num	Time-out (secs)	Active Copy	Recording	Persistent	Reversible
0100:0200	01	10	120	Disabled	Disabled	Disabled	Disabled
0101:0201	01	10	120	Disabled	Disabled	Disabled	Disabled
0102:0202	01	11	120	Disabled	Disabled	Disabled	Disabled
0103:0203	01	11	120	Disabled	Disabled	Disabled	Disabled

Source-Write-Enabled	Target-Write-Enabled	Background-Copy	Copy-Indicator	OutOf-Sync-Tracks	Date-Created	Date-Synced
Enabled	Disabled	Disabled	Yes	0	12/01/2003 02:20:00	12/01/2003 02:23:47
Enabled	Disabled	Disabled	Yes	0	12/01/2003 02:20:00	12/01/2003 02:23:47
Enabled	Disabled	Disabled	Yes	0	12/01/2003 02:20:00	12/01/2003 02:23:47
Enabled	Disabled	Disabled	Yes	0	12/01/2003 02:20:00	12/01/2003 02:23:47

Deleting FlashCopy relationships

Complete this task to delete FlashCopy relationships.

Deleting FlashCopy relationships between volume pairs ends a FlashCopy operation. You can delete a FlashCopy relationship at any time. If you delete a FlashCopy relationship with the background copy option and the background copy operation is still in progress, the target volume is not a complete point-in-time copy of the source volume.

You can perform this task using either the DS CLI or the DS Storage Manager.

Perform the following steps to remove FlashCopy relationships using DS CLI commands. The example commands in this task are shown in two formats. The first format shows the type of information the command requires. The second format is an example command with values declared for the variables.

1. Issue the **lsflash** command to check the status information for each FlashCopy relationship. A detailed report (when you use the **-l** parameter) is displayed for each FlashCopy relationship. Enter the **lsflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsflash -dev storage_image_ID -l SourceVolumeID:TargetVolumeID.
```

```
dscli>lsflash -dev IBM.1750-68FA150 -l 0100:0100
```

Use the **-l** parameter to provide a more detailed report about the FlashCopy relationships.

Note: If you have originally used the **mkremoteflash** command to create your FlashCopy relationships, you must enter the **lsremoteflash** command to perform a status check.

2. Analyze the list of volumes and ensure that these are the volumes from which the FlashCopy relationship must be removed.
3. Issue the **rmflash** command to remove the FlashCopy volume relationships. Enter the **rmflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>rmflash -dev storage_image_ID SourceVolumeID:TargetVolumeID
```

Example

```
dscli>rmflash -dev IBM.1750-68FA120 0001:0004 0003:00FF 0008:000C
```

Notes:

- a. The example shows the use of multiple FlashCopy pair IDs. Ensure that you separate multiple FlashCopy pair IDs with spaces.
 - b. If you used the **mkremoteflash** command to create your FlashCopy relationships, you must enter the **rmremoteflash** command to remove the FlashCopy relationships.
4. A confirmation message is displayed for each FlashCopy relationship that you want to remove. Enter **Y** in response to each message that requests that you confirm that you want to remove the specified FlashCopy pair. A message similar to the following appears for each FlashCopy pair being removed when you process the **rmflash** command.

```
Are you sure you want to remove the FlashCopy pair 0001:0004? [y/n]: Y
```

```
FlashCopy pair 0001:0004 successfully removed.
```

Creating remote FlashCopy transactions

Complete this task to create a remote FlashCopy (inband FlashCopy on the ESS 2105) at a target (remote) site using remote FlashCopy commands.

Remote FlashCopy operations can only be processed using the DS CLI and not the DS Storage Manager. (Part of the Remote FlashCopy operation requires that you create paths and volume pairs first. You can issue those requests using either the DS Storage Manager or the DS CLI.)

To establish a FlashCopy relationship at the target site, remote FlashCopy commands are issued to a source volume of a remote mirror and copy volume pair on a source (local) storage unit and sent across paths (acting as a conduit) to a target storage unit. This eliminates the need for a network connection to the target site solely for the management of FlashCopy relationships.

Limitation: Remote FlashCopy commands establish a FlashCopy relationship at the target (remote) site when a network connection to the target site is lost. The Remote FlashCopy operation is not supported through the DS Storage Manager, because network connections to both the source and target sites are required. If the network connection to the target site is lost, the DS Storage Manager cannot connect to the target site. Whether you use the DS Storage Manager or DS CLI for Steps 1 and 2, you must perform Step 3 from the DS CLI.

Note: You can perform all steps from the DS CLI. The details are described in "Processing Remote FlashCopy (inband) transactions."

The following example illustrates the required steps for creating a remote FlashCopy operation.

1. **Create paths between the source LSS and the target LSS.** For example, IBM.1750-1300861 and IBM.1750-1300871 You need to know which volumes are available for use before you can issue the request to establish the path.
2. **Create Metro Mirror volume pairs from the source LSS to the target LSS.** For example, volume 2200 (IBM.2107-1300861/2200) from LSS22 and volume 2A00 (IBM.2107-1300871/2A00) from LSS22.
3. **Enable a Remote FlashCopy operation at the target site using volume B as the source volume and volume C as the target volume.** Assume that the target site network connection is lost. You can create the FlashCopy relationship from volume B to volume C (both volumes at the target site). However, you cannot use the DS Storage Manager for this step because connections to the target site are lost.

Assume that you performed Step 1 and Step 2 from the DS Storage Manager (connections to both storage units at the source and target sites were available at that time) and the Metro Mirror relationship between the volume pair still exists. To create the Remote FlashCopy operation, you must perform Step 3 from the DS CLI using the following command as an example. (You must be logged into the DS CLI in interactive command mode.)

Note: Use LSS 22 on the local site as a conduit LSS for the new remote Flash Copy relationship on the remote storage unit that will use volume 2A00 as the source. The target can be any other volume on the remote storage unit (in this example 2A01)

```
dscli>mkremoteflash -dev IBM.2107-1300871 -conduit IBM.2107-1300861/22  
2A00:2A01
```

where:

-dev Specifies the storage unit ID, which includes manufacturer, machine type, and serial number.

-conduit *LSS_ID*

(Required) Identifies the source LSS of an existing remote mirror and copy relationship that is used as a conduit for communicating with the target storage unit. The source volume IDs that are specified in *source_volume_ID:target_volume_ID* must be the target volumes in a remote mirror and copy relationship in which one of the conduit LSS volumes acts as a source volume. You can specify a fully qualified LSS ID, which includes the storage unit ID.

source_volume_ID:target_volume_ID

(Required) Establishes a remote FlashCopy relationship for the source and target volume pairs with the specified IDs. You can specify fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage unit IDs if the **-dev** parameter is specified. Separate the IDs of the FlashCopy relationships with spaces.

This report is displayed if your command input is correct.

Date/Time: February 7, 2005 4:29:42 PM IST IBM DSCLI Version: 5.0.0.0 DS: IBM.2107-1300871 FlashCopy Pair ID 2A00:2A01 successfully initiated. Use the `lsremoteflash` command to determine copy completion.

Verify that the transaction has processed successfully by issuing the following command:

```
dscli>lsremoteflash -dev IBM.2107-1300871 -conduit IBM.2107-1300861/22
2A00:2A01
```

Resynchronizing FlashCopy relationships

Complete this task to resynchronize (apply incremental changes on the source volume to) a FlashCopy target volume. After the initial FlashCopy operation, only data that has changed on the source volume since the last resynchronization operation was performed is copied to the target volume.

The change recording option and the persistent option must have been enabled on the FlashCopy volume pair. When a pair is established with the **-record** and **-persist** parameters, the pair initially synchronizes and then a record of all host write operations to the source is maintained in the source volumes.

You can resynchronize a FlashCopy target volume to create a new point-in-time copy of your data without waiting to copy an entire volume for each point-in-time copy. Instead, only tracks that have changed on the source volume since the last resynchronization operation was performed are copied to the target volume. The specified parameters in this command replace the parameters in the existing relationship. In order to keep the initial **-record** and **-persist** parameters, specify the **-record** and **-persist** parameters with the **resyncflash** command.

You can perform this task using either the DS CLI or the DS Storage Manager.

Perform the following step to resynchronize FlashCopy relationships with DS CLI commands. The example commands in this task are shown in two formats. The

first format shows the type of information the command requires. The second format is an example command with declared values for the variables.

Issue the **resyncflash** command to resynchronize FlashCopy relationships. Enter the **resyncflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>resyncflash -dev storage_image_ID sourcevolumeID:targetvolumeID
```

Example

```
dscli>resyncflash IBM.1750-68FA120/0100:IBM.1750-68FA120/0200
```

The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120
```

FlashCopy pair IBM.1750-68FA120/0100:IBM.1750-68FA120/0200 successfully incremented.

Reversing a FlashCopy relationship

Complete this task to reverse the direction of a FlashCopy volume pair.

When the direction of a FlashCopy relationship is reversed, the volume that was previously defined as the target becomes the source for the volume that was previously defined as the source. The data that has changed is copied to the volume that was previously defined as the source. For example, suppose you create a FlashCopy relationship between source volume A and target volume B. Data loss occurs on source volume A. To keep applications running, you can reverse the FlashCopy relationship so that data on volume B is copied to volume A.

The background copy process must complete before you can reverse the direction of the FlashCopy relationship.

Exception: You cannot reverse the direction of the FlashCopy relationship during recovery from the failure of FlashCopy consistency group formation in a Global Mirror configuration due to a failure at the Global Mirror primary site. In this case, after you ensure the consistency of the FlashCopy consistency group target volumes, you can use the **fast** option of the **reverseflash** command before the background copy process completes to reverse the direction of the FlashCopy volume pair.

You can perform this task using either the DS CLI or the DS Storage Manager.

Perform the following step to reverse the direction of FlashCopy relationships with DS CLI commands. The example commands in this task are shown in two formats. The first format shows the type of information the command requires. The second format is an example command with declared values for the variables.

Issue the **reverseflash** command to reverse the direction of FlashCopy relationships. Enter the **reverseflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>reverseflash -dev storage_image_ID sourcevolumeID:targetvolumeID
```

Example

```
dscli>reverseflash IBM.1750-68FA120/0100:IBM.1750-68FA120/0200
```

The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120
```

```
FlashCopy pair IBM.1750-68FA120/0100:IBM.1750-68FA120/0200  
successfully reverse restored.
```

Applying the FlashCopy revertible option to existing FlashCopy relationships

Complete this task to prepare for disaster recovery of a FlashCopy consistency group in a Global Mirror configuration. Issue the **setflashrevertible** command to a FlashCopy relationship with the persistent, change recording, target write inhibit, and no copy options enabled, and the revertible option disabled. It is not valid to issue the **setflashrevertible** command to a FlashCopy relationship that is already revertible.

The **setflashrevertible** command modifies a FlashCopy volume pair that is part of a Global Mirror relationship to *revertible*. If a failure occurs on the primary site during a Global Mirror create FlashCopy consistency group process and if that failure results in an inconsistency of the FlashCopy consistency group target volumes, you might be able to correct the inconsistency either by discarding changes or committing changes to the target volumes. The revertible option allows data to be committed to the target to form a new consistency group or to be reverted back to the last consistency group. The **setflashrevertible** command must be run before the FlashCopy pair can be committed or reverted. You must have previously created a FlashCopy relationship with the persistent, change recording, target write inhibit, and no copy options enabled. The FlashCopy Revertible option must be disabled prior to performing this task. It is not valid to perform the FlashCopy Revertible task on a FlashCopy relationship that is already revertible.

The FlashCopy Revertible task restarts an existing FlashCopy volume pair with the revertible option enabled for disaster recovery. The FlashCopy Revertible option remains in effect until the commit changes or discard changes task is performed. Both the commit changes and discard changes tasks disable the FlashCopy revertible option.

You can perform the FlashCopy Revertible task using either the DS CLI or the DS Storage Manager.

Perform the following steps to apply the revertible option to existing FlashCopy relationships with DS CLI commands. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format is an example command with declared values for the variables.

Note: The **-nocp**, **-record**, **-persist**, and **-tgtinhibit** (target inhibit) parameters are included automatically when this command processes.

Issue the **setflashrevertible** command to apply the revertible option to existing FlashCopy relationships. Enter the **setflashrevertible** command at the dscli command prompt with the following parameters and variables:

```
dscli>setflashrevertible -dev storage_image_ID sourcevolumeID:targetvolumeID
```


Note: Specify the storage unit for the **-dev storage_image_ID** parameter. This parameter is required if you do not specify a fully qualified ID for the source and target volumes and you do not specify a value for the *dev* variable in your profile file.

Example

```
dscli>setflashrevertible  
IBM.1750-68FA120/0100:IBM.1750-68FA120/0200
```

The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120
```

FlashCopy volume pair IBM.1750-68FA120/0100:IBM.1750-68FA120/0200 successfully made revertible.

Starting a background copy of a FlashCopy relationship

Complete this task to create a FlashCopy volume pair that allows data to be copied from the source volume to the target volume.

When you issue a FlashCopy command without using the **nocp** parameter, the FlashCopy relationship is established but it is put in a queue for background copying. The exact time that the background copying starts for the specific relationship depends on the number of FlashCopy relationships that have already begun, or are waiting to begin, background copying. When the background copy starts, the state of that FlashCopy volume pair is displayed as "background copy running".

A background copy causes all data on the source volume to be physically copied to the target volume. After a FlashCopy pair is established, an automatic withdrawal of the FlashCopy relationship occurs when all source tracks have been physically copied to the target volume (unless the FlashCopy relationship was designated as persistent by using the **persist** parameter when it was established).

Note: The amount of time that the actual physical copy can take depends on the amount of data that is copied and other activities that are occurring on the storage unit. You can monitor when the copy completes by issuing the **lsflash** command to check the status information for each FlashCopy relationship.

Perform the following steps to create FlashCopy relationships with DS CLI commands. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format is an example command with declared values for the variables.

1. Issue the **mkflash** command without the **nocp** parameter to create FlashCopy relationships that allow data to be copied from the source volume to the target volume. Enter the **mkflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkflash -dev storage_image_ID sourcevolumeID:targetvolumeID
```

Example

```
dscli>mkflash -dev IBM.1750-68FA150 0001:0004
```

Note: Specify the storage unit for the **-dev storage_image_ID** parameter. This parameter is required if you do not specify a fully qualified ID for the source and target volumes and you do not specify a value for the *dev* variable in your profile file.

A confirmation message is issued for each successful FlashCopy pair that is created.

2. Issue the **lsflash** command to check the status information for each FlashCopy relationship. A detailed report (when you use the **-l** parameter) is displayed for each FlashCopy relationship. Enter the **lsflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsflash -dev storage_image_ID -l SourceVolumeID:TargetVolumeID.
```

Example

```
dscli>lsflash -dev IBM.1750-68FA150 -l 0100:0100
```

Use the **-l** parameter to provide a more detailed report about the FlashCopy relationships.

Preventing write operations on FlashCopy target volumes

Complete this task to prevent (inhibit) host write operations on FlashCopy target volumes. By inhibiting writes on the target volume, you ensure that the target is an uncorrupted incremental backup.

Use the **mkflash** command with the **tgtinhibit** parameter to prevent host write operations on the target volume. When you use the **tgtinhibit** parameter, the change recording feature is not active on the target volume. Write operations are not allowed on the target volume; therefore, the change recording bitmap for the target volume is not modified.

Note: By default, when you issue a **mkflash** command with the **record** and **persist** parameters, the FlashCopy relationship is established to act as an incremental FlashCopy. In addition, by default, when you issue the **setflashrevertible** command to a FlashCopy volume pair, the source volume of the volume pair is write inhibited. This allows the FlashCopy relationship to revert (change back) to a previous consistent state, if needed.

You can perform this task using either the DS CLI or the DS Storage Manager.

Perform the following steps to prevent (inhibit) host write operations on FlashCopy target volumes with DS CLI commands. The example commands in this task are shown in two formats. The first format shows the type of information the command requires. The second format is an example command with declared values for the variables.

Issue the **mkflash** command with the **tgtinhibit** parameter to prevent host write operations on the target volume of the FlashCopy relationships that you create. Enter the **mkflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkflash -dev storage_image_ID -tgtinhibit sourcevolumeID:targetvolumeID
```

Example

```
dscli>mkflash -dev IBM.1750-68FA150 -tgtinhibit 0001:0004
```

A confirmation message is issued for each successful FlashCopy pair that is created.

Creating a FlashCopy target volume on an existing Metro Mirror source volume

Complete this task to create a FlashCopy target volume on an existing Metro Mirror source volume.

Use the **mkflash** command with the **tgtpprc** parameter to create a FlashCopy target volume on an existing Metro Mirror source volume. The FlashCopy takes a point-in-time copy of a source volume, and then Metro Mirror makes a copy of the FlashCopy target volume at a remote site.

You can perform this task using either the DS CLI or the DS Storage Manager.

Perform the following steps to create a FlashCopy target volume on an existing Metro Mirror source volume with DS CLI commands. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format is an example command with declared values for the variables.

- Issue the **mkflash** command with the **tgtpprc** parameter to create a FlashCopy target volume on an existing Metro Mirror source volume. Enter the **mkflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkflash -dev storage_image_ID -tgtpprc sourcevolumeID:targetvolumeID
```

Example

```
dscli>mkflash -dev IBM.1750-68FA150 -tgtpprc 0001:0004
```

A confirmation message is issued for each successful FlashCopy pair that is created.

Note: The **tgtpprc** parameter can also be used with the **resyncflash** command. When you issue a **resyncflash** command to a FlashCopy relationship, only the new write operations to the source since the last resynchronization are copied to the target. This minimizes the data that is copied to the remote site when you also use the **tgtpprc** parameter. The specified parameters in the **resyncflash** command replace the parameters in the existing relationship. In order to keep the initial **record**, **persist**, and **tgtpprc** parameters, the **record**, **persist**, and **tgtpprc** parameters must be specified in the **resyncflash** command.

- Issue the **resyncflash** command with the **tgtpprc** parameter to resynchronize FlashCopy relationships and create a FlashCopy target volume on an existing Metro Mirror source volume. Enter the **resyncflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>resyncflash -dev storage_image_ID -record -persist -tgtpprc  
sourcevolumeID:targetvolumeID
```

Example

```
dscli>resyncflash -dev IBM.1750-68FA120  
-record -persist -tgtpprc 0100:0200
```

The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120
```

FlashCopy pair 0100:0200 successfully incremented.

Discarding changes to FlashCopy target volumes

Complete this task to discard changes to FlashCopy target volumes to form a consistency group on the target volumes as part of a disaster recovery process.

You cannot discard changes to FlashCopy target volumes unless you have modified the FlashCopy relationship using the **setflashrevertible** command, which changes the Revertible value to Enabled. You can use the **revertflash** command only when your analysis of the FlashCopy relationships reveals one of the following conditions:

- The FlashCopy relationships are revertible and all the sequence numbers are equal.
- There is a group of FlashCopy pairs that are all revertible and another group of FlashCopy pairs that are all nonrevertible. In addition, all the FlashCopy sequence numbers are not equal. However, the following conditions exist:
 - The FlashCopy sequence number for all revertible pairs is equal.
 - The FlashCopy sequence number for all nonrevertible pairs is equal.

If a FlashCopy consistency group formation operation does not complete, you must determine whether to discard changes (revert to a previous consistent state) or commit the operation to the current state. As part of a disaster recovery process, determine the state of the consistency groups in the affected sessions. The Discard Changes task specifies that the previous consistency group that was created by the Global Mirror session becomes the current state, and the Commit Changes task is no longer possible.

The Discard Changes task removes the FlashCopy relationship changes and resets them to the last consistency group state. The revertible state is set to No.

You can perform this task using either the DS CLI or the DS Storage Manager.

Perform the following step to correct the applicable FlashCopy relationships with DS CLI commands. The example command in this task is shown in two formats. The first format shows the type of information that the command requires. The second format is an example command with declared values for the variables.

Issue the **revertflash** command to correct the FlashCopy relationships and reset them to the last consistency group state. Enter the **revertflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>revertflash -dev storage_image_ID SourceVolumeID
```

Example

```
dscli>revertflash -dev IBM.1750-68FA150 0100
```

Notes:

1. Remember that *storage_image_ID* is the value for the remote server that has been designated the primary server until the original primary server is again available for use.
2. Global Mirror operations have performed the establish FlashCopy revertible processing but might have failed to form a consistency group before the disaster occurred. If your analysis, through use of the **lsflash** command, has determined that a **revertflash** command is needed, there is no need to issue a new **mkflash** command.

A confirmation message like the following one is generated for each FlashCopy relationship that has been successfully reset.

FlashCopy pair 0100:0200 successfully reverted to the previous consistency.

Committing data to FlashCopy target volumes

Complete this task to commit data to FlashCopy target volumes to form a consistency group on the target volumes as part of a disaster recovery process.

You can commit changes to FlashCopy target volumes only if you have modified the FlashCopy relationship using the **setflashrevertible** command, which changes the Revertible value to Enabled. You can use the **commitflash** command to commit data only when your analysis of the FlashCopy relationships reveals one of the following conditions:

- All the FlashCopy sequence numbers are equal and at least one of the FlashCopy relationships is nonrevertible.
- The FlashCopy relationships appear as follows:
 - Some of the FlashCopy relationships completed processing so that a consistent group was created. These FlashCopy relationships are no longer revertible.
 - Some of the FlashCopy relationships have not completed creating a new consistency group. These FlashCopy relationships are still in a revertible state.
 - All the FlashCopy relationships have the same FlashCopy sequence number. This indicates that all the FlashCopy relationships are involved in the same consistency group.

If a FlashCopy consistency group formation operation does not complete, you must verify the consistency group at the remote site and determine whether the changes need to be “rolled forward” (committed) or “rolled backward” (discarded). The commit task specifies that the last consistency group that has been created by the Global Mirror session is committed to the current state, and reverting to the previous consistency group state is no longer possible.

You can perform this task using either the DS CLI or the DS Storage Manager.

Perform the following step to correct the applicable FlashCopy relationships with DS CLI commands. The example command in this task is shown in two formats. The first format shows the type of information that the command requires. The second format is an example command with declared values for the variables.

Issue the **commitflash** command to correct the FlashCopy relationships and commit them to the consistency group that was being formed before the disaster occurred. Enter the **commitflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>commitflash -dev storage_image_ID SourceVolumeID
```

Example

```
dscli>commitflash -dev IBM.1750-68FA150 0100
```

Note:

- Remember that *storage_image_ID* is the value for the remote server that has been designated the primary server until the original primary server is again available for use.

- Global Mirror operations have performed the establish FlashCopy revertible processing and might have failed to form a consistency group before the disaster occurred. If your analysis, through use of the **lsflash** command, has determined that a **commitflash** command is needed, there is no need to issue a new **mkflash** command.

A confirmation message like the following one is generated for each FlashCopy relationship that has been successfully reset.

FlashCopy pair 0100:0200 successfully committed.

Metro Mirror functions

This topic provides information to help you use Metro Mirror functions using the DS CLI commands. Metro Mirror is a function for application data recovery, but also for failover to remote sites for disaster recovery, remote migration of data, and off-site backups.

Note: If you are using the Cisco MDS 9216 Multilayer Fabric Switch, you must not enable its write acceleration feature. The Remote Mirror and Copy commands might fail if the write acceleration feature is enabled.

Displaying the status of established paths

Complete this task to display a list of established remote mirror and copy paths that are established between LSSs.

Before you begin with this task, ensure that the following guidelines are met:

- Fibre-channel I/O ports are configured.
- Fibre-channel paths have been established between source and target LSSs.

Use this task after you have issued the **mkpprcpath** command to determine the status of the paths that have been established between the specified source and target LSSs.

Perform the following step to display the status of established remote mirror and copy paths with DS CLI commands:

Issue the **lspprcpath** command to display the list of established paths. Enter the **lspprcpath** command at the dscli command prompt with the following parameters and variables:

```
dscli>lspprcpath -dev storage_image_ID Source_LSS_ID.
```

Example

```
dscli>lspprcpath -dev IBM.1750-68FA120 10
```

Note: You can specify multiple LSS IDs, but they must be separated with spaces.

Displaying the WWNN of a storage unit

Complete this task to display a list of worldwide node names (WWNNs) of the storage unit in a storage complex.

Before you begin, ensure that you have met the following conditions:

- The remote mirror and copy license key is installed and enabled to allow operations to be performed.

- The fibre-channel I/O ports are configured.

To participate in a fibre channel environment, each storage unit is assigned a unique 16-hexadecimal ID called a WWNN that identifies the storage unit. You must use the WWNN of the storage unit as part of the **lsavailpprcport** and **mkpprcpath** commands.

Perform the following steps to display the WWNN of the storage unit in a storage complex. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **lssi** command to display the list of WWNNs. Enter the **lssi** command at the dscli command prompt as follows:

```
dscli>lssi -l
```
2. Review the output that displays the WWNN of the storage unit. This information is required when you establish a path.

Creating remote mirror and copy paths

Complete this task when you create paths because they are required when creating source and target remote mirror and copy volume pair relationships.

Before you begin, ensure that you have met the following conditions:

- The remote mirror and copy license key is installed and enabled to allow operations to be performed. If you are using a Model 2105 ESS as part of the configuration, ensure that you have the PPRC Version 2 license enabled.
- The I/O ports are configured for paths between source and target LSSs.
- The I/O ports that will be used for paths are available and identified.
- The worldwide node name (WWNN) of the storage unit is identified because it is a required parameter for this task.

Create paths so that the logical subsystems (LSSs) are associated with each other. These are the paths through which data will be transferred so it essential that bandwidth for these operations be sufficient. In addition, you want to ensure that the ports used for remote mirror and copy operations are not the same ones that will be used for host I/O activity.

Perform the following steps to create remote mirror and copy paths. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **mkpprcpath** command to create the fibre-channel paths for the remote mirror and copy source and target volume pairs. Enter the **mkpprcpath** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkpprcpath -dev storage_image_ID -remotedev storage_image_ID
-remotewwnn wwnn -srcLSS source_LSS_ID -tgtLSS target_LSS_ID
source_port_ID:target_port_ID
```

Notes:

- a. The **-remotedev** parameter specifies the ID of the secondary storage unit.

- b. The **-remotewwnn** parameter must specify the WWNN of the secondary storage unit. If you specify the WWNN of the primary storage unit, the command fails.
- c. You can specify the **-dev** and **-remotedev** parameters or specify fully-qualified **src_lss** and **tgt_lss** parameters, but not both.
- d. The shortened version of the **-src_lss** and **-tgt_lss** parameters are shown (value = 00) because the example uses the fully qualified **-dev storage_image_ID** parameter. If the fully qualified **-dev** parameter was not used, you must specify the fully qualified **-src_lss source_LSS_ID** and the **-tgt_lss target_LSS_ID** values. For example:
-src_lss IBM.1750-75FA120/00 -tgt_lss IBM.1750-75FA120/01
- e. The shortened version of the **source_port_ID:target_port_ID** parameter is shown (value = I1A10:I2A20), because the example uses the fully qualified **-dev storage_image_ID** and **-remotedev storage_image_ID** parameters. If the fully qualified **-dev** and **-remotedev** parameters were not used, you must use the fully qualified **source_port_ID:target_port_ID** value. For example:
IBM.1750-68FA120/I1A10:IBM.1750-68FA150/I2A20.

The fully qualified **source_port_ID:target_port_ID** parameter is positional on your command line. It must be placed after the **-tgt_lss** parameter. For example:

```
dscli>mkpprcpath -src_lss 00 -tgt_lss 00
IBM.1750-68FA120/I1A10:IBM.1750-68FA150/I2A20
```

Example

```
dscli>mkpprcpath -dev IBM.1750-75FA120 -remotedev IBM.1750-68FA150
-src_lss 00 -tgt_lss 00
-remotewwnn 12341234000A000F
I1A10:I2A20
```

2. Issue the **lspprcpath** command to review the list of established remote mirror and copy paths,

Correcting a path-related configuration error

Complete this task to correct a path-related configuration error with DS CLI commands.

There might be occasions when you are using the **mkpprcpath** command to establish a path between the specified source and target LSSs and the transaction fails. You might not be aware of the failure until you run the **lspprcpath** command to check the status of the paths that have been established between the specified source and target LSSs.

The **lspprcpath** command displays a report that includes a *state* category. The state category reports on the current remote mirror and copy path state. One of the state codes is **configuration error**. A state code of configuration error is an indication that you have specified an incorrect value for the remote WWNN or the target lss ID.

Perform the following steps to correct the configuration error with DS CLI commands.

1. Check the original input values you provided for the **-remotewwnn** and **-tgt_lss** parameters.

The following criteria applies to these parameters:

-remotewwnn

You must use the worldwide node name that is associated with the secondary storage unit. If you use the WWNN (worldwide node name) that is associated with the primary storage unit, the **mkpprcpath** command fails. Issue the **lssi** or **showsi** command to obtain the remote WWNN number of the secondary storage unit.

tgtlss You must use the logical subsystem ID that is associated with the secondary storage unit as the target. You can verify that you have used the correct value by looking at the report that is generated by the **lspprcpath** command.

2. Obtain the correct values for the remote WWNN or target LSS ID and reissue the **mkpprcpath** command followed by issuing the **lspprcpath** command to verify that your transaction has processed correctly.

Removing paths

Complete this task to remove paths between the LSSs on the source storage unit and the target LSSs on the target storage units.

Before you delete paths, review the paths that are currently established.

If you delete all paths, you lose the communication between your remote mirror and copy volume pairs. All paths between the source LSS and target LSS are removed.

Perform the following steps to remove the paths between the source and target LSSs with DS CLI commands. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **lspprcpath** command to display a list of existing remote mirror and copy path definitions. Enter the **lspprcpath** command at the dscli command prompt with the following parameters and variables:

```
dscli>lspprcpath -dev storage_image_ID source_LSS_ID
```

Example

```
dscli>lspprcpath -dev IBM.1750-68FA120 01
```

The report that displays from this command provides the worldwide node name (WWNN) that is used with the **rmpprcpath** command.

2. Issue the **rmpprcpath** command to remove the paths between all source and target pairs. Enter the **rmpprcpath** command at the dscli command prompt with the following parameters and variables:

```
dscli>rmpprcpath -dev storage_image_ID -remotedev storage_image_ID  
-remotewwnn wwnn source_LSS_ID:target_LSS_ID
```

Example

```
dscli>rmpprcpath -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150  
-remotewwnn 12341234000A000F 01:01
```

Note:

- The **-remotedev** parameter specifies the ID of the secondary storage unit.
- The **-remotewwnn** parameter must specify the WWNN of the secondary storage unit. If you specify the WWNN of the primary storage unit, the command fails.

- If you do *not* specify the fully qualified **-dev** and **-remotedev** parameters, you must use the fully qualified **source_LSS_ID:target_LSS_ID** value. For example:
IBM.1750-68FA120/01:IBM.1750-68FA150/01

The fully qualified **source_LSS_ID:target_LSS_ID** value must be the last parameter in your command.

A confirmation message is displayed for each path that is being removed.

3. Enter **Y** to confirm that you want to remove the specified remote mirror and copy path. A message similar to the following appears for each remote mirror and copy path that is being removed when you process the **rmpprcpath** command.

Are you sure you want to delete PPRC path (whatever was designated)?

[y/n]: Y

PPRC path (designated in the command) successfully deleted.

4. Repeat Step 2 for all the remote mirror and copy paths that you want removed from the same source LSS to a different target LSS.

Creating a Metro Mirror relationship

Complete this task to create a Metro Mirror relationship between a source volume and target volume.

Before you begin, ensure that you have met the following conditions:

- The remote mirror and copy license key is installed and enabled to allow operations to be performed. If you are using a Model 2105 ESS as part of the configuration, ensure that you have enabled PPRC Version 2 license.
- The I/O ports are configured for paths between source and target LSSs.
- The fibre-channel paths are created between all Metro Mirror source and target LSSs. The paths are required for communication between the volume pairs and to copy data from the source volumes to the target volumes. Otherwise, this task fails.

Metro Mirror is a function of a storage server that constantly updates a target copy of a volume to match changes made to a source volume. The source and target volumes can be on the same storage unit or on separate storage units. Metro Mirror creates the remote mirror and copy relationship in a synchronous manner.

Metro Mirror functions run on the DS6000 storage unit and are supported on many operating systems. For example, if you set up and configure your DS6000 to use i5/OS, you can use Metro Mirror to create a copy of a System i disk pool on a separate DS6000, typically in a remote location.

Perform the following steps to create Metro Mirror relationships between the source volumes and target volumes.

1. Issue the **lsfbvol** command (for fixed blocked (FB) volumes) or the **lsckdvol** command (for count key data (CKD) volumes) to display which volumes are available for Metro Mirror relationships on the source and target LSSs. A report is displayed that shows the availability of the volumes.
2. Issue the **mkpprc** command to create a Metro Mirror relationship between a source volume and a target volume.

The **mkpprc** command must contain the following parameters and variables:
dscli>mkpprc -dev *storage_imag_ID* -remotedev *storage_image_ID* -type mmir
SourceVolumeID:TargetVolumeID.

Note:

- The **-remotedev** parameter specifies the ID of the secondary storage unit.
- The **-type mmir** parameter specifies that you want to establish one or more Metro Mirror volume relationships. Metro Mirror creates the remote mirror and copy relationship in a synchronous manner.
- The shortened version of the **SourceVolumeID:TargetVolumeID** parameter is shown (value = 0100:0100) because the example uses the fully qualified **-dev storage_image_ID** and **-remotedev storage_image_ID** parameters. If the fully qualified **-dev** and **-remotedev** parameters were not used, you must use the fully qualified **SourceVolumeID:TargetVolumeID** value. For example: IBM.1750-68FA120/0100:IBM.1750-68FA150/0100 .

Example

```
dscli>mkpprc -dev IBM.1750-68FA120 -remotedev IBM.1750-75FA150 -type mmir 0100:0100
```

A confirmation message is issued for each successful Metro Mirror volume association that is created.

3. Issue the **lspprc** command to view the status information of each Metro Mirror relationship in the list. Enter the **lspprc** command at the dscli command prompt with parameters and variables as follows:

```
dscli>lspprc -dev storage_image_ID -remotedev storage_image_ID -s SourceVolumeID:TargetVolumeID.
```

```
dscli>lspprc -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150 -s 0100:0100 0101:0101
```

Creating a Metro Mirror consistency group

Complete this task to create a Metro Mirror consistency group.

Ensure that the Remote Mirror and Copy license key is installed and enabled to allow the operations to be performed.

In order to restart applications at a remote site successfully, data at the remote site must be consistent. The Metro Mirror consistency group function keeps data consistency at the remote site using consistency groups. A consistency group is a group of volumes that provides the ability to temporarily queue (at the host's level) subsequent write operations to all consistency group volumes on a single LSS pairing when an error occurs to one of the volumes in the group (source or target), or when a total link failure is detected between the source and target LSS volume pair.

The consistency group function of Metro Mirror consists of two parts. One is the consistency group option and the other is the freeze and unfreeze operation. The freeze operation causes the storage unit to hold off I/O activity through the **freezepprc** command. The unfreeze operation allows I/O activities to resume when you issue the **unfreezepprc** command.

You can specify the consistency group option when you are defining Metro Mirror paths between pairs of LSSs or when you change the default consistency group setting on each LSS (the consistency group option is disabled by default) with the **chlss** command.

A group of volumes in a consistency group can consist of a combination of count-key-data volumes and fixed block volumes. In addition, the group of

volumes in a consistency group can also consist of source volumes that are associated with a 1750 storage unit and target volumes that are associated with an ESS 2105 Model 800 or 750.

Perform the following step to define a path that has enabled the consistency group option for the volume pairs that are associated with the LSS volume pair. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with values declared for the variables.

1. Issue the **mkpprcpath** command to create a consistency group for the remote mirror and copy volume pairs. Enter the **mkpprcpath** command with the **-consistgrp** parameter at the dscli command prompt with the following parameters and variables:

```
dscli>mkpprcpath -dev storage_image_ID -remotedev storage_image_ID -srclss source_LSS_ID -tgtlss target_LSS_ID -remotewwnn wwnn -consistgrp source_port_ID:target_port_ID
```

Example

```
dscli>mkpprcpath -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150  
-srclss 01 -tgtlss 01 -remotewwnn 12341234000A000F -consistgrp I0100:I0100
```

2. View the current consistency group state setting status of the consistency group by issuing the **showlss** command. You can also use the **chlss** command to change the default consistency group timeout value.

```
dscli>showlss -dev storage_image_ID LSS_ID
```

Example

```
dscli>showlss IBM.1750-68FA120/10
```

Resuming a Metro Mirror relationship

Complete this task to resume a Metro Mirror volume pair that has been suspended (paused).

Before you begin, ensure that you have met the following conditions:

- The remote mirror and copy license key is installed and enabled to allow operations to be performed. If you are using a Model 2105 ESS as part of the configuration, ensure that you have enabled the PPRC Version 2 license.
- The fibre-channel paths are created between all Metro Mirror source and target LSSs. .

When you suspend (pause) volume pairs, Metro Mirror processing stops transferring data to the target volumes. Any I/O operations to the source volume are tracked during this time.

Use this task to resume a suspended (paused) Metro Mirror volume on the specified LSSs. When I/O is resumed, data is sent across to the target volumes.

Perform the following steps to resume Metro Mirror processing with DS CLI commands. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

Issue the **resumepprc** command to continue Metro Mirror processing after it has been suspended (paused). Enter the **resumepprc** command at the dscli command prompt with the following parameters and variables:

```
dscli> resumepprc -dev storage_image_ID  
-remotedev storage_image_ID -type [mmir, gcp] SourceVolumeID:TargetVolumeID
```

Notes:

1. The **-remotedev** parameter specifies the ID of the secondary storage unit.
2. Specify the **-type** parameter when you use the **resumepprc** command. Otherwise, the command fails.
3. If you do *not* specify the fully qualified **-dev** and **-remotedev** parameters, you must use the fully qualified **SourceVolumeID:TargetVolumeID** value. For example:
IBM.1750-68FA120/01:IBM.1750-68FA150/01

Example

```
dscli> resumempprc -dev IBM.1750-68FA120  
-remotedev IBM.1750-68FA150 -type mmir 0100:0100
```

Pausing a Metro Mirror relationship

Complete this task to pause (suspend) a Metro Mirror relationship.

If you need to access target volumes or perform maintenance on a remote storage unit, you can pause (or suspend) Metro Mirror volume pairs. This task pauses a Metro Mirror volume pair that you specify, and data is not copied to the target volume. The source storage unit keeps track of all changed data on the source volume, and after you resume the connection, only changes to the source volume are copied to the target volume.

Perform the following steps to pause Metro Mirror processing with DS CLI commands. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

Issue the **pausepprc** command to pause Metro Mirror processing. Enter the **pausepprc** command at the dscli command prompt using the following parameters and variables:

```
dscli> pausepprc -dev storage_image_ID -remotedev storage_image_ID  
SourceVolumeID:TargetVolumeID
```

Note:

- The **-remotedev** parameter specifies the ID of the secondary storage unit.
- If you do *not* specify the fully qualified **-dev** and **-remotedev** parameters, you must use the fully qualified **SourceVolumeID:TargetVolumeID** value. For example: IBM.1750-75FA120/01:IBM.1750-68FA150/01.

Example:

```
dscli> pausepprc -dev IBM.1750-68FA120  
-remotedev IBM.1750-68FA150 0100:0100
```

A confirmation message is displayed that indicates that processing for the specified volume pair has been paused.

After making your changes, you can resume processing by issuing the **resumepprc** command.

Creating a Global Copy relationship

Complete this task to create a Global Copy relationship between a source volume and target volume.

Before you begin, ensure that you have met the following conditions:

- The remote mirror and copy license key is installed and enabled to allow operations to be performed. If you are using a Model 2105 ESS as part of the configuration, ensure that you have PPRC Version 2 license enabled.
- The I/O ports are configured for paths between source and target LSSs.
- The fibre-channel paths are created between all Metro Mirror source and target LSSs. The paths are needed for communication between the volume pairs and to copy data from the source volumes to the target volumes. Otherwise, this task fails.

You can create a Global Copy relationship between a source and target volume. Global Copy functions run on the DS6000 storage units and are supported on many operating systems. For example, if you set up and configure your DS6000 to use i5/OS, you can use Global Copy to create a copy of a System i disk pool on a separate DS6000, typically in a remote location.

Perform the following steps to create Global Copy relationships between the source volumes and target volumes.

1. Issue the **lsfbvol** command (for fixed blocked (FB) volumes) or the **lsckdvol** command (for count key data (CKD) volumes) to display which volumes are available for Global Copy relationships on the source and target LSSs. A report is displayed that shows the availability of the volumes.
2. Issue the **mkpprc** command to create a Global Copy relationship between a source volume and a target volume. Enter the **mkpprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkpprc -dev storage_image_ID -remotedev storage_image_ID  
-type gcp -mode full SourceVolumeID:TargetVolumeID
```

Notes:

- a. The **-remotedev** parameter specifies the ID of the secondary storage unit.
- b. The **-type gcp** parameter specifies that one or more Metro Mirror volume relationships be established. Global Copy creates the remote mirror and copy relationship in an asynchronous manner.
- c. The shortened version of the **SourceVolumeID:TargetVolumeID** parameter is shown (value = 0100:0100) because the example uses the fully qualified **-dev storage_image_ID** and **-remotedev storage_image_ID** parameters. If the fully qualified **-dev** and **-remotedev** parameters were not used, you must use the fully qualified **SourceVolumeID:TargetVolumeID** value. For example: IBM.1750-68FA120/0100:IBM.1750-68FA150/0100 . This value must be placed at the end of your command line.

Example

```
dscli>mkpprc -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150  
-type gcp -mode full 0100:0100
```

A confirmation message is issued for each successful Global Copy volume association that is created.

3. Issue the **lspprc** command to view the status information of each Metro Mirror relationship in the list. Enter the **lspprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>lspprc -dev storage_image_ID -remotedev storage_image_ID -s
SourceVolumeID:TargetVolumeID.

dscli>lspprc -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150
-s 0100:0100 0101:0101
```

Deleting a Metro Mirror relationship

Complete this task to delete the Metro Mirror relationship between a source and target volume.

You can use this task to delete the relationship between a Metro Mirror volume pair. The source and target volumes are removed from the configuration when this process runs.

The **rmpprc** command removes a remote mirror and copy (formerly PPRC) volume pair relationship.

Perform the following steps to delete the Metro Mirror relationship with DS CLI commands. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **lspprc** command to generate a report of Metro Mirror relationships. This can help you determine which Metro Mirror relationship that you want to delete. Enter the **lspprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>lspprc -dev storage_image_ID -state -remotedev storage_image_ID
SourceVolumeID:TargetVolumeID
```

Example

```
dscli>lspprc -dev IBM.1750-68FA120 -l -remotedev IBM.1750-68FA150 0100:0100
0101:0101
```

2. Issue the **rmpprc** command to delete the Metro Mirror relationship between the source and target volume. Enter the **rmpprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>rmpprc -dev storage_image_ID -remotedev SourceVolumeID:TargetVolumeID
```

Example

```
dscli>rmpprc -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150 0100:0100
```

Notes:

- a. If you delete a Metro Mirror volume pair with the source LSS and the process runs successfully, the source and the target volume go into the simplex state.
- b. If you delete a Metro Mirror volume pair with the target LSS and the process runs successfully, the source volume is in the suspended state, and the target volume is in the simplex state. This option is useful in a disaster situation when the source (local) site has failed.

Modifying logical subsystem timeout values

This section describes the list of logical subsystem (LSS) timeout values that you can modify using DS CLI commands.

The following lists contains the LSS timeout values that you can modify using the **mkpprpath** command:

- Concurrent copy timeout (zSeries only)
- Consistency group timeout
- Critical mode enable (zSeries only)

Modifying the Concurrent Copy timeout value

Complete this task to modify a Concurrent Copy timeout value, which determines how long a volume in a Concurrent Copy session stays "long busy" (unavailable) before suspending the session. This topic applies to zSeries only.

Use the **chlcu** command to modify the Concurrent Timeout value of the logical control unit. The Concurrent timeout value determines how long a logical volume in a Concurrent Copy session in a specified LSS remains in a long-busy condition before the session is suspended.

Perform the following step to modify a Concurrent Copy timeout value (the DS CLI command refers to this as **-ccsess timeout** or Concurrent Copy session timeout). The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

Issue the **chlcu** command to modify a Concurrent Copy timeout value. Enter the **chlcu** command at the dscli command prompt with the following parameters and variables:

```
dscli>chlcu -dev storage_image_ID -ccsess timeout LCU_ID
```

Example

```
dscli>chlcu -dev IBM.1750-68FA120 -ccsess 190 00-0F
```

A confirmation message is displayed for each LCU that has been modified.

Modifying the consistency group timeout value

Complete this task to modify the consistency group timeout value, which determines the amount of time that I/O is withheld from updating a source volume of a consistency group after an error occurs.

The consistency group timeout value (the **-extlongbusy timeout** parameter) is the time in seconds that a volume in a Metro Mirror consistency group stays unavailable after an error causes the suspension of a consistency group operation if a consistency group is not received before the timeout value. The consistency group timeout value enables automation software to detect that an error has occurred and to issue a command to freeze all other volumes of the consistency group. When an error is detected, a long-busy condition occurs.

Perform the following step to modify the consistency group timeout value. The example command in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

Issue the **chlcu** command to modify the consistency group timeout value. Enter the **chlcu** command at the dscli command prompt with the following parameters and variables:


```
dscli>chlcu -dev storage_image_ID -extlongbusy timeout LCU_ID
```

Example

```
dscli>chlcu -dev IBM.1750-68FA120 -extlongbusy 3 00-0F
```

Modifying the z/OS Global Mirror timeout value

Complete this task to modify the time that a volume in an z/OS Global Mirror session remains in a long-busy condition (the volume is not available) before the session is suspended. This task can be done in the DS8000 only.

You can modify the z/OS® Global Mirror timeout value, which determines how long any volume in the selected LSS in a z/OS Global Mirror session remains long busy before the session is suspended. The default value is 300 seconds. (The z/OS Global Mirror timeout value is also known as the Extended Remote Copy (XRC) timeout value that is supported on the ESS.)

The long-busy condition occurs because the system data mover cannot copy data when the volume (or z/OS Global Mirror session) is not able to accept additional data. The value of this timeout is associated with a z/OS Global Mirror session when the session is created.

Perform the following step to modify the z/OS Global Mirror timeout value. The example command in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with values declared for the variables.

Issue the **chlcu** command to modify the z/OS Global Mirror timeout value. Enter the **chlcu** command at the dscli command prompt with the following parameters and variables:

```
dscli>chlcu -dev storage_image_ID -xrcsess timeout LCU_ID
```

Example

```
dscli>chlcu -dev IBM.1750-68FA120 -xrcsess 175 00-0F
```

Modifying the critical mode setting

Complete this task to enable the critical mode setting to prevent write operations to source volumes if data cannot be copied to the target volume of the volume pair because of a permanent error. You must have Administrator authority to perform this task.

The critical mode setting is used to determine the behavior of remote mirror and copy (PPRC) pairs or consistency groups after the source and target storage units can no longer communicate or when paths between a volume pair in the specified LSS are lost. This setting is associated with the volume pairs in the LSSs that you selected. This option is available for z/OS environments only.

When you enable the critical mode setting, the volume pair is suspended and further write operations to the source volume are not accepted if data cannot be sent to the target volume. The volume pair remains in a suspended state until you correct the problem and either issue a request to resynchronize the volume pair or delete it.

If you do not enable this setting and an error occurs to the target volume, the remote mirror and copy feature suspends the copy pair, which allows the subsequent write operations to be copied to the source volume of that volume pair.

The storage unit records all tracks that have changed. When the problem is resolved, you can resynchronize the volume pair.

Perform the following step to modify the critical mode setting. The example command in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

Issue the **chlcu** command to modify the critical mode setting. Enter the **chlcu** command at the dscli command prompt with the following parameters and variables:

```
dscli>chlcu -dev storage_image_ID -critmode enable LCU_ID
```

Example

```
dscli>chlcu -dev IBM.1750-68FA120 -critmode enable 00-0F
```

Note: Use the **-critmode** parameter only for log devices, not for devices that the system requires. In extreme cases, the host system might have to be IPLed in order to recover a device that is write inhibited. Whenever possible, use the **freezepprc** command as an alternative to using the **-critmode** parameter.

This parameter cannot be used with Global Copy or remote copy and mirror cascading volumes.

This parameter only applies to S/390 or zSeries volumes.

The following table presents an overview of how the critical volume mode works.

Critical Mode	LCU, Critical Heavy	mkpprc critmode	Description
Normal	Disabled or Enabled	Disabled	- Suspends the primary volume. - Allows write operations to the primary volume.
Critical Volume	Disabled	Enabled	- Suspends primary volume when the last path to the secondary volume has failed. - Inhibits write operations to the primary volume.
Critical Heavy	Enabled	Enabled	- Suspends the primary volume when the secondary volume cannot be updated for any reason. - Inhibits write operations to the primary volume.

Defining a path that has the consistency option enabled

Complete this task to define a path that has enabled the consistency group option for the volume pairs that are associated with the LSS volume pair.

Ensure that the Remote Mirror and Copy license key is installed and enabled to allow the operations to be performed.

The **mkpprcpath** command establishes or replaces a remote mirror and copy (formerly PPRC) path between source and target logical subsystems (LSSs) over a fibre-channel connection. This is the only supported connectivity for machine types 2107 and 1750. Paths can be established between the following machine types: 2105:2105, 2107:2107, 2107:1750, 2107:2105, 1750:1750, 1750:2105.

A consistency group is a group of volumes that provides the ability to temporarily queue (at the host's level) subsequent write operations to all consistency group volumes on a single LSS pairing when an error occurs to one of the volumes in the group (source or target), or when a total link failure is detected between the source and target LSS volume pair.

This process describes how to define paths that have enabled the consistency group option. This means that when an error occurs on any volume pairs or on the links that are associated with these LSS pairs, an alert is issued and I/O to all duplex remote mirror and copy volumes on LSS pairs will be queued either until a consistency group creation operation is run or the consistency group timeout time expires. This allows external automation to use the consistency group created operation to create a dependent write consistent set of target volumes over any number of LSS and disk storage units.

Perform the following step to define a path that has enabled the consistency group option for the volume pairs that are associated with the LSS volume pair. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with values declared for the variables.

Issue the **mkpprcpath** command to create a consistency group for the remote mirror and copy volume pairs. Enter the **mkpprcpath** command with the **-consistgrp** parameter at the dscli command prompt with the following parameters and variables:

```
dscli>mkpprcpath -dev storage_image_ID -remotedev storage_image_ID -src1lss  
source_LSS_ID -tgt2lss target_LSS_ID -remotewwnn wwnn -consistgrp  
source_port_ID:target_port_ID
```

Example

```
dscli>mkpprcpath -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150  
-src1lss 01 -tgt2lss 01 -remotewwnn 12341234000A000F -consistgrp I0100:I0100
```

Monitoring Remote Mirror and Copy paths

Complete this task to display a list of existing remote mirror and copy path definitions using the DS CLI.

Perform the following step to display a list of existing remote mirror and copy path definitions. The example command in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

Issue the **lspprcpath** command to generate a report of existing remote mirror and copy path definitions. Enter the **lspprcpath** command at the dscli command prompt with the following parameters and variables:

```
dscli>lspprcpath -dev storage_image_ID -fullid Source_LSS_ID
```

Example

```
dscli>lspprcpath -dev IBM.1750-68FA120 -fullid 10
```

Performing a failover recovery operation

Complete this task to perform a failover recovery operation using DS CLI Metro Mirror. In a disaster recovery process, the failover procedure must be followed by a failback procedure after a path from the target site to the source site is created.

You must have created a remote mirror and copy volume pair. Volume sizes for operations that use failover and failback operations must be the same; otherwise, the failback operation fails.

A failover to the Global Copy secondary volume turns the secondary volumes into primary volumes and suspends these volumes immediately. When you run a Global Copy failover, the B volumes are the primary volumes and the A volumes are the secondary volumes. This action just changes the Global Copy state of the secondary volumes from Target Copy Pending to Suspended. The **failoverpprc** command changes a secondary device into a primary suspended device while leaving the primary device in its current state. This command succeeds even if the paths are down and the volume at the production site is unavailable or nonexistent.

Perform the following step to perform a failover recovery operation. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

Issue the **failoverpprc** command to perform a failover recovery operation. Enter the **failoverpprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>failoverpprc -dev storage_image_ID -remotedev storage_image_ID  
SourceVolumeID:TargetVolumeID
```

Example

```
dscli>failoverpprc -dev IBM.1750-68FA150 -remotedev IBM.1750-68FA120  
0100-0103:0100-0103
```

Performing a failback recovery operation

Complete this task to perform Global Copy failback processing for the A volumes. This process resynchronizes the volumes at Site A with volumes at Site B and restarts mirroring from site A (local site) to site B (remote site).

You must first create a remote mirror and copy volume pair. Before you run the failback operation, the volumes must be full duplex.

The **failbackpprc** command copies the required data from the source volume to the target volume in order to resume mirroring. The failover process converted the

full-duplex target volumes at site A to suspended source volumes. The volumes at site A started the change recording process while in failover mode.

The failback processing that is described in this task can be issued against any remote mirror and copy volume that is in a primary suspended state. The failback processing copies the required data from the source volume to the target volume in order to resume mirroring.

Perform the following step to perform a failback recovery operation. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **failbackpprc** command to perform a failback recovery operation. Enter the **failbackpprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>failbackpprc -dev storage_image_ID -remotedev storage_image_ID  
SourceVolumeID:TargetVolumeID
```

Example

```
dscli>failbackpprc -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150  
0100-0103:0100-0103
```

2. Issue the **lspprc** command to check the status information of each Metro Mirror relationship in the list. Enter the **lspprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>lspprc -dev storage_image_ID -remotedev storage_image_ID -s  
SourceVolumeID:TargetVolumeID
```

Example

```
dscli>lspprc -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150  
-s 0100:0100 0200:0200 0300:0300
```

Viewing information about Metro Mirror relationships

Complete this task to view information about Metro Mirror relationships using the DS CLI.

The **lspprc** command displays a list of remote mirror and copy (formerly PPRC) volume relationships for a storage unit, and status information for each remote mirror and copy volume relationship in the list.

Perform the following step to view information about Metro Mirror relationships. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

Issue the **lspprc** command to generate a report of Metro Mirror relationships. Enter the **lspprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>lspprc -dev storage_image_ID -state -remotedev storage_image_ID  
SourceVolumeID:TargetVolumeID
```

Example

```
dscli>lspprc -dev IBM.1750-68FA120 -l -remotedev IBM.1750-68FA150 0100:0100  
0101:0101
```

Converting Global Copy volume pairs to synchronous

Complete this task to convert Global Copy volume pairs to synchronous (Metro Mirror volume pairs).

Before you begin, ensure that the license for the remote mirror and copy feature is activated. Paths are required between the source and the target LSS storage units for the volume pairs.

There are two common situations where you would convert a Global Copy volume pair to a Metro Mirror volume pair:

- You have used the Global Copy function to complete the bulk transfer of data in the creation of many copy pairs, and you now want to convert some or all of those pairs to Metro Mirror mode.
- You have Global Copy pairs for which you want to make FlashCopy backups on the remote site. You convert the pairs temporarily to synchronous mode to obtain a point-in-time consistent copy.

If you created a Global Copy volume pair where the source volume was associated with a 1750 and the target volume was associated with an ESS 2105 Model 800 or 750, you can convert that volume pair to synchronous.

Perform the following step to convert Global Copy volume pairs to synchronous (Metro Mirror volume pairs). The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

Issue the **mkpprc** command to convert Global Copy volume pairs to synchronous (Metro Mirror volume pairs). Enter the **mkpprc** command with the **-type mmir** parameter at the dscli command prompt with the following parameters and variables:

```
dscli>mkpprc -dev storage_image_ID -remotedev storage_image_ID -type mmir  
SourceVolumeID:TargetVolumeID
```

Example

```
dscli>mkpprc -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150  
0100:0100 -type mmir 0101:0101 0102:0102 0103:0103
```

Determining which I/O ports are available for paths

Complete this task to determine which I/O ports are available for paths between the source and target LSSs.

Before you begin with this task, ensure that the following guidelines are met:

- The remote mirror and copy license key is installed and enabled to allow operations to be performed.
- The fibre-channel I/O ports are configured. .
- The I/O ports that will be used for paths are available and identified. .
- The WWNN of the storage unit is identified because it is a required parameter for this task.

Before you create paths, use this task to determine which ports are available for remote mirror and copy (formerly PPRC) I/O operations. These are the ports

through which data will be transferred so it essential that bandwidth for these operations be sufficient. In addition, you want to ensure that the ports used for remote mirror and copy operations are not the same ones that will be used for host I/O activity.

You need to determine which source and target I/O ports are available for paths on the local and remote storage units. The output that is generated from this task displays fibre channel protocol (FCP) I/O ports that are available to be used as remote mirror and copy paths.

Note: When you establish FCP paths, the LSSs on the source and target storage units can be connected either through a point-to-point connection (no switch) or through a switched fabric. For fibre-channel attachments, you can establish zones to help reduce the possibility of interactions between system adapters in switched configurations. For information, see the fibre channel switches publication that is available for your environment.

Perform the following steps to determine the available I/O ports with DS CLI commands. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with values declared for the variables.

1. Issue the **lsavailpprcport** command to display a list of available I/O ports that are available for paths. Enter the **lsavailpprcport** command at the dscli command prompt with the parameters and variables shown as follows:

```
dscli>lsavailpprcport -dev storage_image_ID -remotedev storage_image_ID  
-remotewwnn wwnn source_LSS_ID:target_LSS_ID
```

Notes:

- a. The **-remotedev** parameter specifies the ID of the secondary storage unit.
- b. The **-remotewwnn** parameter must specify the worldwide node name of the secondary storage unit. If you make a mistake and specify the worldwide node name of the primary storage unit, the command fails.
- c. The shortened version of the **source_LSS_ID:target_LSS_ID** parameter is shown (value = 01:01) because the example uses the fully qualified **-dev storage_image_ID** and **-remotedev storage_image_ID** parameters. If the fully qualified **-dev** and **-remotedev** parameters were not used, you must use the fully qualified **source_LSS_ID:target_LSS_ID** value. For example:
IBM.1750-68FA120/01:IBM.1750-68FA150/01

The fully qualified **source_LSS_ID:target_LSS_ID** value must be placed after the **-remotewwnn** value in your command line. For example, your command line would look like the following:

```
dscli>lsavailpprcport -l -remotewwnn 12341234000A000F  
IBM.1750-68FA120/01:IBM.1750-68FA150/01
```

Example

```
dscli>lsavailpprcport -l -dev IBM.1750-68FA120  
-remotedev IBM.1750-68FA150 -remotewwnn 12341234000A000F 01:01
```

2. Analyze the output that is generated and select from the available I/O ports to create the path. The information that is displayed shows available I/O ports combinations between the source LSSs and the target LSSs and the output depends on the current selection of adapters.

Deleting a single volume Metro Mirror relationship

Complete this task to delete the single volume Metro Mirror relationship whether it exists on the source or the target volume.

There might be times when a communication problem occurs between your primary server and your secondary server or visa versa. If this happens during the processing of a **rmpprc** command, only part of the removal transaction is completed. The removal takes place even though the error message might indicate that the entire process has failed.

To correct this situation and to remove the other part of the pair relationship, you must reissue the **rmpprc** command for each volume that was not removed using the following parameters:

- The **-at src** parameter, if the pair relationship has not been removed from the source volumes.
- The **-at tgt** parameter, if the pair relationship has not been removed from the target volumes.
- The **-unconditional** parameter with the **-at src** or **-at tgt** parameter; otherwise, the transaction fails.

When the transaction completes, the affected volume is returned to a simplex state and becomes available for use in another pair relationship.

Perform the following steps to delete the Metro Mirror relationship with DS CLI commands. The example commands in this task are shown in two formats. The first format shows the type of information the command requires. The second format provides the command with declared values for the variables.

1. Issue the **lspprc** command to generate a report about Metro Mirror relationships. This can help you determine which Metro Mirror relationships must be deleted. Enter the **lspprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>lspprc -dev storage_image_ID -remotedev storage_image_ID -l  
SourceVolumeID:TargetVolumeID
```

Example

```
dscli>lspprc -dev IBM.1750-68FA120  
-remotedev IBM.1750-68FA150 -l 0100:0100 0101:0101
```

2. Issue the **rmpprc** command to delete the pair relationship that the volume still maintains. Enter the **rmpprc** command at the dscli command prompt with the following parameters and variables:

Source volume

```
dscli>rmpprc -dev storage_image_ID -at src -unconditional SourceVolumeID
```

Example

```
dscli>rmpprc -dev IBM.1750-68FA120 -at src -unconditional 0100
```

Target volume

```
dscli>rmpprc  
-dev storage_image_ID -at tgt -unconditional TargetVolumeID
```

Example

```
dscli>rmpprc -dev IBM.1750-68FA150 -at tgt -unconditional 0100
```

Notes:

- a. The **-dev** parameter must contain the value of the secondary server when you are removing the pair relationship from a target volume.
- b. The management console must be able to communicate with the secondary server for this command to succeed.

Copy Services functions across a 2105 and 1750

Copy Services functions that are performed using either the DS Storage Manager or DS CLI interact with both the DS8000 (Machine type 2107) DS6000 (Machine type 1750) and the IBM System Storage 2105 Enterprise Storage Servers (ESS) Models 800 and ESS 750.

Most Copy Services functions that are available on the ESS 2105 are also available on the 2107 and 1750 and in open systems and zSeries® environments.

Before you begin, consider the following guidelines:

- To perform Copy Services functions between machine types 2105, 1750 and 2107, you must configure a Copy Services domain on the DS Storage Manager or DS CLI.
- To connect to the 2105 Copy Services domain on the ESS, all interfaces that you use require an authenticated login procedure to access Copy Services functions across the storage complex. The authentication is performed by using a user name and password that was created with the ESS Specialist. Therefore, the existing user name and password that was created with the ESS Specialist for the 2105 Copy Services domain for which you will be working must match the user name and password on the management console that is connected to the 2107 or 1750. Otherwise, you must add them using either the DS Storage Manager or DS CLI as part of the procedure for adding a 2105 Copy Services domain to the storage complex.
- To manage Copy Services across the 2105 and 1750, you must install licensed internal code version 2.4.2 or later on the 2105.
- The 2105 nor the 1750 supports remote mirror and copy (formerly PPRC) operations with an ESCON® link. However, if you want to configure a remote mirror and copy relationship between the 1750 and 2105, you must use a FCP link.

Creating a Metro Mirror volume pair between a 1750 and a 2105

Complete this task to create a Metro Mirror volume pair using volumes from a 1750 and a 2105.

Before you begin, ensure that you meet the following requirements:

- The license for the remote mirror and copy feature must be activated.
- To create a Metro Mirror volume pair between Model types 1750 and a 2105, you must have added the 2105 Copy Services domain to your storage complex environment.
- Ensure that paths are set up between the source and the target LSSs for the Metro Mirror volume pairs. The paths between the 2105 and the 1750 must be configured using Fibre Channel Protocol (FCP) ports.
- The storage type of the source and target volumes on the 1750 and 2105 domain must have the same type. That is, if the source volumes are fixed block volumes, the target volumes must also be fixed block volumes.

- The size of the volumes in the source LSS must be less than or equal to those of the target LSS.
- Gather the following preliminary information:
 - Open the ESS Specialist on the ESS 800 to determine the its WWNN. The WWNN is listed in 20 point font on the opening page. The format is **5005076300C08641**.
 - Determine the number of available volumes on the ESS 800 with the ESS 800 GUI.
 - Document the LSS and volume mappings.
 - Ensure that the volume sizes are matched and are **-type** ESS on the DS6000.

You can create Metro Mirror relationships using source and target volumes from the following machine types:

- A 2107 and a 2107
- A 1750 and a 1750
- A 2107 and a 1750
- A 2105 and a 1750
- A 2105 and a 2107
- A 2105 and a 2105

Note: If the source is a Copy Services 2105 domain, the Metro Mirror task is performed on the source domain. However, if you perform a "Suspend at target" action, the suspension occurs at the target domain.

Perform the following steps to create a Metro Mirror pair between a 1750 and a 2105. For this task, the source domain is a 2105 Model 800 or 750 and the target is a 1750. You can use this task if the target domain is a 2105 Model 800 or 750 and the source is a 1750 by switching the device IDs in the volume pairs. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **lsavailpprcport** command to list all of the available ports to the remote system to create a connection. It is recommended that you use ports that are not mapped to hosts for PPRC for increased performance, but sharing host ports with PPRC ports is supported. Specify the remote WWPN and device ID for the target cluster. Enter the **lsavailpprcport** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsavailpprcport -dev storage_image_ID -remotedev storage_image_ID
                    -remotewwnn wwnn Source_LSS_ID:Target_LSS_ID
```

Example

```
dscli>lsavailpprcport -dev IBM.1750-13AB7DA -remotedev IBM.2105-18602
                    -remotewwnn 5005076300C08642 10:10
```

2. Issue the **mkpprcpath** command to create a path between LSSs on the DS6000 to the ESS 800. You associate an LSS on the DS6000 to the ESS 800 and specify specific ports. You can list multiple ports. You should create redundant port paths from both controllers of the DS6000 to both clusters of the ESS 800. Enter the **mkpprcpath** command at the dscli command prompt with the following parameters and variables:


```
dscli>mkpprcpath -dev storage_image_ID -remotedev storage_image_ID
-srclss source_LSS_ID -tgtlss target_LSS_ID -remotewwnn wwnn
-consistgrp source_port_ID:target_port_ID
```

Example

```
dscli>mkpprcpath -dev IBM.1750-68FA120
-remotedev IBM.2105-18602 -srclss 01 -tgtlss 01
-remotewwnn 12341234000A000F -consistgrp I0100:I0100
```

3. Issue the **lspprcpath** command to display the created paths and their status. "Success" indicates that the path is valid, "failure" indicates that the path did not create correctly, or that the relationship has become separated. Enter the **lspprcpath** command at the dscli command prompt with the following parameters and variables: dscli> lspprcpath -dev IBM.1750-13AB7DA 10

Example

```
dscli>lspprcpath -dev storage_image_ID Source_LSS_ID
```

4. Issue the **rmpprcpath** command to remove a path. You must specify both the source and target device IDs and the source and destination LSS. Enter the **rmpprcpath** command at the dscli command prompt with the following parameters and variables:

```
dscli>rmpprcpath -dev storage_image_ID -remotedev storage_image_ID
source_LSS_ID:target_LSS_ID
```

Example

```
dscli>rmpprcpath -dev IBM.1750-13AB7DA -remotedev IBM.2105-18602 10:10
```

5. Issue the **mkpprc** command to create a relationship between a source and target volume. The volumes must be type ESS and be exactly the same size or the attempt to create the volume pair will fail. Enter the **mkpprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkpprc -dev storage_image_ID -remotedev storage_image_ID
-type mmir SourceVolumeID:TargetVolumeID
```

Example

```
dscli>mkpprc -dev IBM.1750-13AB7DA -remotedev IBM.2105-18602
-type mmir 1001:1001
```

6. Issue the **lspprc** command to list the pairs that are in existence. Upon creation, the volumes will be in the "copy pending" state. When the initial copy is complete, the volumes will show as "full duplex" on the primary and "target full duplex" on the secondary. If something interrupts the connection, the primary volumes indicate "suspended", but the target volumes still show "full duplex." You can specify a range of volumes to list multiple pairs 1001 - 10ff. Enter the **lspprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>lspprc -dev storage_image_ID SourceVolumeID:TargetVolumeID
```

Example

```
dscli>lspprc -dev IBM.1750.13AB7DA 1001-10ff
```

Global Mirror functions

This topic provides information to help you use Global Mirror functions using the DS CLI commands. Global Mirror asynchronously copies data from a host to a remote site, and maintains a consistent copy of the data on a storage unit at the remote site.

Note: If you are using the Cisco MDS 9216 Multilayer Fabric Switch, you must not enable its write acceleration feature. The Global Mirror commands might fail if the write acceleration feature is enabled.

Adding volumes to a session (Global Mirror)

Complete this task to add volumes to a Global Mirror session.

You can add Global Copy primary volumes to a Global Mirror session at any time after the Global Mirror session has started without stopping the session. If you attempt to add a Metro Mirror volume or volumes which, for example, is converted from Global Copy to Metro Mirror, the formation of the consistency group fails.

Volumes can be added to a Global Mirror session but do not become active in the session until the Global Copy pair has completed its first pass and a consistent copy of the data has been formed at the remote site.

If you have many volumes that you want to add to a Global Mirror session, you might consider adding them to the session in stages. This lessens the impact on your processing.

Perform the following steps to add volumes to a Global Mirror session. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **lspprc** command to obtain a list of the Global Copy volumes that you can add to the Global Mirror session. A detailed report is displayed (if you use the **-l** parameter) that allows you to see the available volumes. Enter the **lspprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>lspprc -dev storage_image_ID -remotedev storage_image_ID -l  
SourceVolumeID:TargetVolumeID.
```

Example

```
dscli>lspprc -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150 -l 0100:0100
```

2. Issue the **chsession** command to add the available volumes to a Global Mirror session. Enter the **chsession** command at the dscli command prompt with the following parameters and variables:

```
dscli>chsession -dev storage_image_ID -lss LSS_ID -action add -volume  
volume_ID session_ID
```

Example

```
dscli>chsession -dev IBM.1750-75FA120 -lss 10 -action add -volume 0100-010F 01
```

A confirmation message indicates that the session has been modified successfully.

3. Issue the **lsession** command to query the status of all volumes being processed including the volumes that you added to the session. Enter the **lsession** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsession -dev storage_image_ID -l LSS_ID
```

```
dscli>lsession -dev IBM.1750-68FA120 -l 01
```

When you use the **-l** parameter, a detailed report displays a list of Global Mirror sessions for the specified logical subsystem (LSS) and information about the volumes of each session in the list.

Modifying the tuning parameters of a Global Mirror session

Complete this task to modify the tuning parameters of a Global Mirror session.

A global mirror session consists of tuning parameters and topology, both of which can be modified. However, they cannot be modified using the same method. The modification of the tuning parameters requires that you pause the Global Mirror session and change the parameters. Then you can resume the session with the new tuning parameter values. The modification of the Global Mirror topology requires that you stop the Global Mirror session, change the topology, and then restart Global Mirror processing.

The tuning parameters of a Global Mirror session consist of the following:

- Consistency group interval time
- Maximum coordination interval time
- Maximum consistency drain time

There are two specific occasions when you might want to modify the tuning parameters:

- After the initial setup of your session and your analysis of Global Mirror processing indicates that these parameters should be adjusted.
- After you have stopped (not just paused) Global Mirror processing. When you restart Global Mirror processing, the values for the tuning parameters revert to their DS CLI default values.

Perform the following steps to modify the tuning parameters of a Global Mirror session. The example commands that are displayed in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **pausegmir** command to pause Global Mirror processing on the specified logical subsystem and the specified session within the logical subsystem. Enter the **pausegmir** command at the dscli command prompt using the following parameters and variables:

```
dscli>pausegmir -dev storage_image_ID -lss LSS_ID -session session_ID  
Master_Control_Path_LSS_ID:Subordinate_Control_Path_LSS_ID
```

Example

```
dscli>pausegmir -dev IBM.1750-68FA120 -lss 10  
-session 01 IBM.1750-68FA120/00;IBM.1750-68FA150/00
```

A confirmation message indicates that the session has been paused after all buffered write operations to the target have been processed.

2. Issue the **showgmir** command to receive a report that provides the current properties or performance metrics for a Global mirror logical subsystem ID. Enter the **showgmir** command at the dscli command prompt with the following parameters and variables:

For a detailed properties report: dscli>showgmir -dev *storage_image_ID* *LSS_ID*

For a performance metrics report: dscli>showgmir -dev *storage_image_ID*
-metrics *LSS_ID*

Example

These commands are entered as follows when you add values:

```
dscli>showgmir -dev IBM.1750-68FA120 10  
dscli>showgmir -dev IBM.1750-68FA120 -metrics 10
```

3. Analyze the report and determine which if any of the Global Mirror tuning parameters must be changed.
4. Issue the **resumegmir** command with the values for all three tuning parameters. Enter the **resumegmir** command at the dscli command prompt with the following parameters and variables:

```
dscli>resumegmir -dev storage_image_ID -lss ID -cginterval seconds  
-coordinate milliseconds -drain seconds -session session_ID  
Master_Control_Path_LSS_ID:Subordinate_Control_Path_LSS_ID
```

Example

The example command shows all three tuning parameters with new values. You must specify a value for all three tuning parameters even if only one value has changed. The values for the two unchanged tuning parameters would be the DS CLI default values.

```
dscli>resumegmir -dev IBM.1750-68FA120 -lss 10 -cginterval 10  
-coordinate 60 -drain 35 -session 01  
IBM.1750-68FA120/00:IBM.1750-68FA150/00
```

Notes:

- a. The **-cginterval** parameter specifies the consistency group interval time, in seconds. The value specifies how long to wait between the formation of consistency groups. If this value is set to zero, consistency groups are formed continuously. The DS CLI default value is 0.
- b. The **-coordinate** parameter specifies the maximum coordination interval, in milliseconds. This value indicates the maximum time that Global Mirror processing queues Primary/Host/IO to start forming a consistency group. The DS CLI default value is 50 milliseconds.
- c. The **-drain** parameter specifies the maximum amount of time that writes (in seconds) are inhibited to the remote site before the current consistency group must stop. The DS CLI default value is 30 seconds.

Modifying the topology of a Global Mirror session

Complete this task to modify the topology of a Global Mirror session that is not part of a script.

A Global Mirror session consists of tuning parameters and topology, both of which can be modified. However, they cannot be modified using the same method. The modification of the Global Mirror topology requires that you stop the Global Mirror session, change the topology, and then restart Global Mirror processing. The modification of the tuning parameters is managed differently.

Topology in this process refers to the list of subordinate storage servers. You establish remote mirror and copy paths between the master and subordinate LSSs. Just one LSS per subordinate server is sufficient. When you define the remote mirror and copy path, you identify the primary LSS on the master server. The secondary LSS in the remote mirror and copy path establishes command points to a corresponding subordinate server. These LSSs are part of the topology specification that defines the communication paths between the master and subordinate storage servers.

Note: When you restart Global Mirror processing, the tuning parameters revert to their DS CLI default values.

Perform the following steps to modify the topology of a Global Mirror session. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **showgmir** command to display a detailed properties or performance metrics report for a Global Mirror logical subsystem ID. Enter the **showgmir** command at the dscli command prompt with the following parameters and variables:

For a detailed properties report: dscli>showgmir -dev *storage_image_ID* -fullid *LSS_ID*

For a performance metrics report: dscli>showgmir -dev *storage_image_ID* -metrics *LSS_ID*

These commands are entered as follows when you add values:

```
dscli>showgmir -dev IBM.1750-68FA120 -fullid 10
```

```
dscli>showgmir -dev IBM.1750-68FA120 -metrics 10
```

2. Use the report as a guide to see what is currently being processed and to determine what topology values you want to change.
3. Issue the **rmgmir** command to stop Global Mirror processing. Enter the **rmgmir** command at the dscli command prompt with the following parameters and variables:

```
dscli>rmgmir -dev storage_image_ID -lss ID -session session_ID  
Master_Control_Path_LSS_ID:Subordinate_Control_Path_LSS_ID
```

Example

```
dscli>rmgmir -dev IBM.1750-68FA120 -lss 10  
-session 01 IBM.1750-68FA120/00:IBM.1750-68FA150/00
```

Notes:

- a. This command can interrupt the formation of a consistency group. If this command does not complete, an error code is issued. If this occurs, examine the error code and follow your local procedures for problem determination. In most cases, if you correct the error, you can successfully reissue the **rmgmir** command. If, however, the reissued **rmgmir** command fails and Global Mirror processing must be stopped, reissue the **rmgmir** command with the **-force** parameter.
 - b. You cannot use the **rmgmir** command to stop a script that involves Global Mirror processing. The only way to stop a script is to press the **Ctrl C** keys on your keyboard. This action stops the DS CLI session. However, it does not stop the microcode that is processing Global Mirror transactions. To stop the microcode processing, you must log back into the DS CLI session and issue the **rmgmir** command.
4. Enter **Y** to confirm that you want to stop Global Mirror processing for the specified session.
The message is displayed as follows:
Are you sure you want to stop Session ID (xx)? [y/n]: Y
Global Mirror for Session ID 01 successfully stopped.
 5. Issue the **mkgmir** command with your updated master and subordinate LSS changes to start Global Mirror processing. Enter the **mkgmir** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkgmir -dev storage_image_ID -lss ID -session session_ID  
-cginterval seconds -coordinate milliseconds -drain seconds  
Master_Control_Path_LSS_ID:Subordinate_Control_Path_LSS_ID
```

Example

```
dscli>mkgmir -dev IBM.1750-68FA120 -lss 10 -session 01 -cginterval 0  
-coordinate 40 -drain 35 IBM.1750-68FA120/00:IBM.1750-68FA150/00
```

Notes:

- a. You can change your mind and decide not to change any of the topology values. However, you must still issue the **mkgmir** command to resume Global Mirror processing after you have stopped the processing. Because the **resumegmir** command is used only with the **pausegmir** command, you cannot issue the **resumegmir** command to restart the processing.
- b. When you stopped the Global Mirror session, the values for the tuning parameters become invalid. You must specify values for these parameters (**-cginterval**, **-coordinate**, **-drain**) when you restart your Global Mirror session.

Viewing a Global Mirror session

Complete this task to view the associated properties of the Global Mirror session or information about the volumes in each session.

Issue the **lsession** command to display Global Mirror session information regarding the volumes in each session.

Perform the following step to view the associated properties of the Global Mirror session or information about Global Mirror session failures. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with values declared for the variables.

Issue the **lsession** command to display Global Mirror session information regarding the volumes in each session. Enter the **lsession** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsession -dev storage_image_ID -l LSS_ID
```

Example

```
dscli>lsession -dev IBM.1750-68FA120 -l 01
```

Note:

- Use the **-l** parameter if you want to see a detailed report. The report provides the following information:
 - State of the session status. For example, whether the consistency group of the session is in progress or the increment process is in progress.
 - The status of each volume in the session.
 - Whether the first cycle of the volume in the global mirror relationship has ended. This value is displayed as true or false.
- Use the **-s** parameter if you only want to see the volumes (with no details) that are associated with each session within the LSS.

Querying Global Mirror processing

Complete this task to display detailed properties and performance metrics for a Global Mirror session.

Issue the **showgmir** command to display a detailed report about the current Global Mirror operations and to request that the report include the detailed performance metrics.

Perform the following step to view the detailed properties and performance metrics for a Global Mirror session. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

Issue the **showgmir** command to display a detailed report about the current Global Mirror operations. Or, you can request a report that displays the performance metrics associated with the current Global Mirror operations. Enter the **showgmir** command at the dscli command prompt with the following parameters and variables:

For transaction details, enter: `dscli>showgmir -dev storage_image_ID LSS_ID`

For performance metrics, enter: `dscli>showgmir storage_image_ID -metrics LSS_ID`

Examples

```
dscli>showgmir -dev IBM.1750-68FA120 10
```

```
dscli>showgmir -dev IBM.1750-68FA120 -metrics 10
```

Pausing Global Mirror processing

Complete this task to pause Global Mirror processing.

Use the **pausegmir** command to pause Global Mirror processing. This pause function allows you to temporarily suspend Global Mirror processing attempts to form consistency groups.

There are 2 primary reasons to pause Global Mirror processing:

- You must repair a part of the Global Mirror infrastructure, such as:
 - Global Copy volume pairs
 - FlashCopy pairs
 - Storage control unit values
- You must make modifications to the Global Mirror tuning parameters

Perform the following steps to pause Global Mirror processing. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **pausegmir** command to pause Global Mirror processing. Enter the **pausegmir** command at the dscli command prompt using the following parameters and variables:

```
dscli>pausegmir -dev storage_image_ID -lss LSS_ID -session session_ID  
Master_Control_Path_LSS_ID:Subordinate_Control_Path_LSS_ID
```

Example


```
dscli>pausegmir -dev IBM.1750-68FA120 -lss 10  
-session 01 IBM.1750-68FA120/00:IBM.1750-68FA150/00
```

2. Use the **showgmir** command to verify that your changes are correct. When you are ready to resume Global Mirror processing, issue the **resumegmir** command to continue with the Global Mirror processing. Do not issue the start (**mkgmir**) command to start Global Mirror processing.

Resuming Global Mirror processing

Complete this task to resume Global Mirror processing after you have paused Global Mirror processing.

Note: If you have issued a **pausegmir** command to pause Global Mirror processing, issue the **resumegmir** command to continue Global Mirror processing.

Use the **resumegmir** command to change your Global Mirror tuning parameters and continue Global Mirror processing. When you change the Global Mirror tuning parameters, you must include values for all three parameters (consistency group interval time, coordination interval time, and drain time). You cannot submit a value for just one parameter, even if the two other parameters do not need to be changed.

Perform the following steps to resume Global Mirror processing. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

Issue the **resumegmir** command to continue Global Mirror processing after you have paused Global Mirror processing. Enter the **resumegmir** command at the dscli command prompt using the following parameters and variables:

```
dscli>resumgmir -dev storage_image_ID -lss LSS_ID -session session_ID  
Master_Control_Path_LSS_ID:Subordinate_Control_Path_LSS_ID
```

Example

```
dscli>resumegmir -dev IBM.1750-68FA120 -lss 10  
-session 01 IBM.1750-68FA120/00:IBM.1750-68FA150/00
```

Note: If you are making changes to your tuning parameters, your command looks like the following:

```
dscli>resumegmir -dev IBM.1750-68FA120 -lss 10 -cginterval 5  
-coordinate 50 -drain 30 -session 01  
IBM.1750-68FA120/00:IBM.1750-68FA150/00
```

In this example the **-cginterval** parameter was changed while the **-coordinate** and **-drain** parameters maintained their DS CLI default values. However, because the **-cginterval** parameter was changed, all the parameters and their corresponding values must be listed in your command. Otherwise, the command fails.

Starting Global Mirror processing

Complete this task to start Global Mirror processing.

The volume relationships (paths, pairs, and FlashCopy) plus the creation of a Global Mirror session must be complete before Global Mirror processing can start.

Use the **mkgmir** command to start Global Mirror processing.

Perform the following step to start Global Mirror processing. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

Issue the **mkgmir** command to start Global Mirror processing. Enter the **mkgmir** command at the dscli command prompt using the following parameters and variables:

```
dscli>mkgmir -dev storage_image_ID -lss LSS_ID -cginterval seconds -coordinate  
milliseconds -drain seconds -session session_ID  
Master_Control_Path_LSS_ID:Subordinate_Control_Path_LSS_ID
```

Example

```
dscli>mkgmir -dev IBM.1750-68FA120 -lss 10 -cginterval 0 -coordinate 50  
-drain 30 -session 01 IBM.1750-68FA120/00:IBM.1750-68FA150/00
```

Note: Issuing the **mkgmir** command requires that you specify the tuning parameters. The values for the tuning parameters are not retained when you end Global Mirror processing. So, in the case where you must change the Global Mirror topology parameters, resubmit the tuning parameters when you restart Global Mirror processing.

Ending Global Mirror processing (script mode)

Complete this task to end Global Mirror processing that is being controlled through a script. Perform the steps in this task only if there is no alternative. For example a disaster has occurred and you must immediately stop all processing.

There is no way to pause a script. The only way to stop a script is to press the **Ctrl C** keys, which stops your DS CLI session. It is likely that this action might cause some transactions to remain partly completed and others completely undone.

Pressing **Ctrl C** does not stop Global Mirror processing which is controlled through the microcode. To stop the microcode processing of Global Mirror operations, you must log back into a DS CLI session and issue the **rmgmir** command.

This task does not provide the detailed instructions for recovery. The recovery instructions are described in the *Recovering when a disaster strikes* task.

Perform the following step when you want to end Global Mirror processing that is using a script.

1. Press the **Ctrl C** keys to immediately end the DS CLI session.
2. Log back into a DS CLI session and enter the **rmgmir** command to stop the microcode processing of the Global Mirror operations.
3. Proceed with the steps that are described in the *Recovering when a disaster strikes* task.

Ending Global Mirror processing (no script)

Complete this task to end Global Mirror processing that is not being controlled through a script.

To use this task your Global Mirror processing cannot be controlled through a script.

You can use this task when you must end Global Mirror processing to change the topology of a Global Mirror session or when you have time (because of a rolling disaster) to end processing even though a disaster has occurred. The **rmgmir** command is used to end Global Mirror processing.

Note: This command might interrupt the formation of a consistency group. If, due to failures, this command cannot complete an error code is issued. If this occurs, examine the error code and follow your local procedures for problem determination. In most cases, correcting the error and reissuing the **rmgmir** command is successful. However, if reissuing the **rmgmir** command fails and Global Mirror absolutely must be ended, the **rmgmir** command can be reissued with the **-force** parameter.

Perform the following steps to end Global Mirror processing. The example commands displayed in this task are shown in two formats. The first format shows the type of information the command requires. The second format provides the command with declared values for the variables.

1. Issue the **rmgmir** command to end Global Mirror processing. Enter the **rmgmir** command at the dscli command prompt using the following parameters and variables:

```
dscli>rmgmir -dev storage_image_ID -lss LSS_ID -session session_ID  
Master_Control_Path_LSS_ID:Subordinate_Control_Path_LSS_ID
```

Example

```
dscli>rmgmir -dev IBM.1750-68FA120 -lss 10  
-session 01 IBM.1750-68FA120/00:IBM.1750-68FA150/00
```

2. Enter **Y** in response to each message that requests that you confirm that you want the specified session stopped. A message similar to the following appears when you process the **rmgmir** command.

```
Are you sure you want to close Session ID 01? [y/n]: Y  
Global Mirror for Session ID 01 closed successfully.
```

Setting up the Global Mirror Environment

This task lists the high-level steps that you must complete in order to set up the Global Mirror environment to allow Global Mirror processing.

Each of these steps must be completed in the order in which they are shown before you can move onto the next step.

1. Create fibre-channel paths between all Global Mirror source and target pairs and between the Master and subordinate storage units. See “Creating fibre-channel paths (Global Mirror setup)” on page 149 for additional steps.
2. Create Global Copy pairs from the local storage units to the remote storage units. See “Creating Global Copy pairs (Global Mirror setup)” on page 151 for additional information.
3. Create FlashCopy relationships at the remote site between the Global Copy secondary volumes and the FlashCopy target volumes. See “Creating FlashCopy relationships (Global Mirror setup)” on page 152 for additional information.
4. Create the Global Mirror session. See “Creating the Global Mirror session” on page 153 for additional information.

Creating fibre-channel paths (Global Mirror setup)

Complete this task to create fibre-channel paths between all Global Mirror source and target pairs and between the Master and subordinate storage units. This is the first step in setting up your Global Mirror environment.

Create paths so that the logical subsystems (LSS's) are associated with each other. These are the ports that the copy services I/O pass through. It is preferred that they are not the same ports that are used for host I/O. This ensures that there is enough capacity for the data transfer.

Perform the following steps to create fibre-channel paths between all Global Mirror source and target pairs and between the Master and subordinate storage units. The example commands displayed in this task are shown in two formats. The first format shows the type of information the command requires. The second format provides the command with declared values for the variables.

1. Obtain the worldwide node name of the secondary storage unit. This information is needed when you do the next step. Enter the **lssi** or **shows**i at the dscli command prompt as follows:

```
dscli>lssi -l
```

This is the entire command. there are no additional variables needed.

The **shows**i command does contain a variable and a command flag:

```
dscli>shows storage_image_id -fullid
```

Example

```
dscli>shows -fullid IBM.1750-685FA120
```

Notes:

- a. Use the **lssi** command if you want to display a list of all the storage image instances for a storage-complex and status information for each storage image in the list.
 - b. Use the **shows**i command if you want to display the detailed properties of a specific storage unit.
 - c. Use the **-fullid** DS CLI command flag with the **shows**i command to display fully qualified IDs, which include the storage image ID, for every ID that is displayed in the command output.
 - d. Record the worldwide node name for the secondary (target) storage unit so that it can be used when you issue the **mkpprcpath** command.
2. Issue the **lsavailpprcport** command to display a list of fibre-channel I/O ports that can be defined as remote mirror and copy paths. Enter the **lsavailpprcport** command at the dscli command prompt with the parameters and variables shown as follows:

```
dscli>lsavailpprcport -dev storage_image_ID -remotedev storage_image_ID  
-remotewwnn wwnn source_LSS_ID:target_LSS_ID
```

Example

```
dscli>lsavailpprcport -l -dev IBM.1750-68FA120  
-remotedev IBM.1750-68FA150 -remotewwnn 12341234000A000F 01:01
```

Notes:

- a. The **-remotedev** parameter specifies the ID of the secondary storage unit.

- b. The **-remotewwnn** parameter must specify the worldwide node name of the secondary storage unit. If you make a mistake and specify the worldwide node name of the primary storage unit, the command fails.
- c. The shortened version of the **source_LSS_ID:target_LSS_ID** parameter is shown (value = 01:01) because the example uses the fully qualified **-dev storage_image_ID** and **-remotedev storage_image_ID** parameters. If the fully qualified **-dev** and **-remotedev** parameters were not used, you must use the fully qualified **source_LSS_ID:target_LSS_ID** value. For example:
IBM.1750-68FA120/01:IBM.1750-68FA150/01

The fully qualified **source_LSS_ID:target_LSS_ID** value must be placed after the **-remotewwnn** value in your command line. For example, your command line would look like the following:

```
dscli>lsavailpprcport -l -remotewwnn 12341234000A000F
IBM.1750-68FA120/01:IBM.1750-68FA150/01
```

3. Issue the **mkpprcpath** command to create the fibre-channel paths between all Global Mirror source and target pairs and between the Master and subordinate storage units. Enter the **mkpprcpath** command at the dscli command prompt with the following parameters and variables as follows:

```
dscli>mkpprcpath -dev storage_image_ID -remotedev storage_image_ID
-remotewwnn wwnn -srcLSS source_LSS_ID -tgtLSS target_LSS_ID
source_port_ID:target_port_ID
```

Example

```
dscli>mkpprcpath -dev IBM.1750-68FA120 -remotedev
IBM.1750-68FA150 -remotewwnn 12341234000A000F
-srcLSS 00 -tgtLSS 01 I1A10:I2A20
```

Notes:

- a. The **-remotedev** parameter specifies the ID of the secondary storage unit.
- b. The **-remotewwnn** parameter must specify the worldwide node name of the secondary storage unit. If you make a mistake and specify the worldwide node name of the primary storage unit, the command fails.
- c. The shortened version of the **-srcLSS** parameter is shown (value = 00) because the example uses the fully qualified **-dev storage_image_ID** parameter. If the fully qualified **-dev** parameter was not used, you must use the fully qualified **-srcLSS source_LSS_ID** value. For example: **-srcLSS IBM.1750-68FA120/00**.
- d. The shortened version of the **-tgtLSS** parameter is shown (value = 01) because the example uses the fully qualified **-dev storage_image_ID** parameter. If the fully qualified **-dev** parameter was not used, you must use the fully qualified **-tgtLSS target_LSS_ID** value. For example: **-tgtLSS IBM.1750-68FA120/01**.
- e. The shortened version of the **source_port_ID:target_port_ID** parameter is shown (value = I1A10:I2A20) because the example uses the fully qualified **-dev storage_image_ID** and **-remotedev storage_image_ID** parameters. If the fully qualified **-dev** and **-remotedev** parameters were not used, you must use the fully qualified **source_port_ID:target_port_ID** value. For example: **IBM.1750-68FA120/I1A10:IBM.1750-68FA150/I2A20**.

The fully qualified *source_port_ID:target_port_ID* parameter is positional on your command line. It must be placed after the -tgtlss parameter and value. For example:

```
dscli>mkpprcpath -src1ss 00 -tgtlss 01
IBM.1750-68FA120/I1A10:IBM.1750-68FA150/I2A20
```

Creating Global Copy pairs (Global Mirror setup)

Complete this task to create Global Copy pairs from the local storage units to the remote storage units. This is the second step in setting up your Global Mirror environment.

Ensure that you have already created the fibre-channel paths between all Global Mirror source and target pairs and between the master and subordinate storage units.

The purpose of this step is to create a relationship between a source volume and a target volume.

Perform the following steps to create Global Copy pairs from the local storage units to the remote storage units. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **mkpprc** command to create a Global Copy pair from the local storage unit to the remote storage unit and to create a relationship between the associated source volume and target volume. Enter the **mkpprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkpprc -dev storage_imag_ID -remotedev storage_image_ID -type
gcp SourceVolumeID:TargetVolumeID
```

Example

```
dscli>mkpprc -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150 -type gcp
0100:0100
```

Notes:

- a. The **-remotedev** parameter specifies the ID of the secondary storage unit.
- b. The **-type gcp** parameter specifies that one or more remote mirror and copy Global Copy volume relationships be established. Global Copy maintains the remote mirror and copy relationship in a nonsynchronous manner.

A confirmation message is issued for each successful Global Copy volume association that is created.

2. Issue the **lspprc** command to check the status information for each remote mirror and copy volume relationship in the list. Enter the **lspprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>lspprc -dev storage_image_ID -remotedev storage_image_ID
-l SourceVolumeID:TargetVolumeID
```

Example

```
dscli>lspprc -dev IBM.2107-68FA120 -remotedev IBM.2107-68FA150 -l 0100:0100
```

Use the **-l** parameter to provide a more detailed report about the Global Copy volume relationships.

It is recommended that you wait until the Global Copy pair process has completed its first pass before you begin creating the FlashCopy relationships.

Note: Global Copy source volumes are not in the active Global Mirror session until the volumes have been added to the session and the session has started.

Creating FlashCopy relationships (Global Mirror setup)

Complete this task to create FlashCopy relationships at the remote site between the Global Copy secondary volumes and the FlashCopy target volumes. This is the third step in setting up your Global Mirror environment.

The following tasks must be completed before you can initiate this step:

- Ensure that the fibre-channel paths between all Global Mirror source and target pairs and between the master and subordinate storage units have been created.
- Ensure that the Global Copy pairs have been created between the local storage units and the remote storage units.

The purpose of this task is to create a FlashCopy target for the Global Mirror pairs.

Perform the following steps to create FlashCopy relationships at the remote site between the Global Copy secondary volumes and the FlashCopy target volumes. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **mkflash** command to create FlashCopy relationships at the remote site between the Global Copy secondary volumes and the FlashCopy target volumes. Enter the **mkflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkflash -dev storage_image_ID -tgtinhibit -persist -record -nocp  
sourcevolumeID:targetvolumeID
```

Example

```
dscli>mkflash -dev IBM.1750-68FA150 -tgtinhibit -record  
-persist -nocp 0001:0004
```

Notes:

- a. Specify the storage image ID of the secondary storage unit for the **-dev *storage_image_ID*** parameter. If the management console has an IP connection to the specified "remote async site", the command works. If the IP connection is not established, issue the **mkremoteflash** command with all the same parameters as displayed in the example.
- b. Specify the **-tgtinhibit** parameter to prevent writes to the target volume.
- c. Specify the **-record** parameter to activate the change recording function on the volume pair.
- d. Specify the **-persist** parameter to retain the FlashCopy relationship after the background copy completes.
- e. Specify the **-nocp** parameter to prevent creating a background copy.

A confirmation message is issued for each successful FlashCopy pair that is created.

2. Issue the **lsflash** command to check the status information for each FlashCopy relationship at the remote site. Enter the **lsflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsflash -dev storage_image_ID -l SourceVolumeID:TargetVolumeID
```

Example


```
dscli>lsflash -dev IBM.1750-68FA150 -l 0100:0100
```

Use the **-l** parameter to provide a more detailed report about the FlashCopy relationships.

Note: If you used the **mkremoteflash** command, you must enter the **lsremoteflash** command to perform a status check.

Creating the Global Mirror session

Complete this task to create a Global Mirror session. This is the fourth step in setting up your Global Mirror environment. After you complete this step you are ready to start Global Mirror processing.

The following tasks must be completed before you can proceed with this step.

- Ensure that the fibre-channel paths between all Global Mirror source and target pairs and between the master and subordinate storage units have been created.
- Ensure that the Global Copy pairs have been created between the local storage units and the remote storage units.
- Ensure that the FlashCopy relationships at the remote site between the Global Copy secondary volumes and the FlashCopy target volumes have been created.

The purpose of this step is to create a container that associates volumes with a Global Mirror session.

Perform the following steps to create the Global Mirror session. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **mksession** command to create the Global Mirror session. Enter the **mksession** command at the dscli command prompt using the following parameters and variables:

```
dscli>mksession -dev storage_image_ID -lss LSS_ID -volume volume_ID  
Session_ID
```

Example

```
dscli>mksession -dev IBM.1750-68FA120 -lss 10 -volume 0800-0810 01
```

2. Repeat Step 1 for each LSS.

You must make a session for each LSS. However, you can associate each LSS with the same session. For example: You have LSS 08 and it contains volumes 0800 - 0810. You create a session and assign it to session 08. You also have LSS 09 and it contains volumes 0900 - 0910. You create a session and assign it to session 08. When you start Global Mirror processing, the volumes for LSS 8 and LSS 9 are processed in the same session (session 08).

Removing a Global Mirror environment

This task lists the high-level steps that you must complete in order to remove the Global Mirror environment from your system.

The removal of a Global Mirror environment is prompted by circumstances similar to the following:

- You decide that you want to run with a totally different configuration.
- You were running a test and the volumes you were using you never want to use for an asynchronous pair again.

Each of the following steps must be completed in sequence before you can move on to the next step.

1. Remove all Global Copy primary volumes from the Global Mirror sessions. See “Removing volumes from a session (Global Mirror)” for additional information.
2. End the Global Mirror sessions.
See “Ending a Global Mirror session” on page 155 for additional information.
3. Withdraw all FlashCopy relationships between the B and C volumes. See “Removing FlashCopy relationships” on page 156 for additional information.
4. Remove the Global Copy pair relationships. See “Removing the Global Copy pair relationship” on page 157 for additional information.
5. Remove the remote mirror and copy paths between the local site and the remote site. “Removing the fibre-channel paths” on page 158 for additional information.

Removing volumes from a session (Global Mirror)

Complete this task to remove volumes from a Global Mirror session. This task is also the first step in removing the Global Mirror environment from your system.

Ensure that you have closed the Global Mirror sessions associated with the Global Mirror environment if you are processing this task as part of removing the Global Mirror environment from your system.

This task covers two circumstances

- removing volumes from a session without removing the session from Global Mirror processing
- removing all volumes from each session as part of the steps for removing the Global Mirror environment from your system.

You can remove Global Copy primary volumes from a Global Mirror session at any time after the Global Mirror session has started without stopping the session.

If you have many volumes that you want to remove from a Global Mirror session, you might consider removing them from the session in stages. This lessens the impact on your processing. If you intend to use the volumes in a different configuration, you must remove the pair and path associations. Removing a volume from a Global Mirror session does not remove the pair and path associations.

Perform the following steps to remove volumes from a Global Mirror session. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **lsession** command to query the status of all volumes that are associated with the sessions of a specified logical subsystem. Enter the **lsession** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsession -dev storage_image_ID -l LSS_ID
```

```
dscli>lsession -dev IBM.1750-68FA120 -l 01
```

When you use the **-l** parameter, a detailed report displays a list of Global Mirror sessions for the specified logical subsystem (LSS) and information about the volumes of each session in the list.

2. Analyze the report and determine which volumes that you want to remove.

3. Issue the **chsession** command to remove the specified volumes from the specified Global Mirror session. Enter the **chsession** command at the dscli command prompt with the following parameters and variables:

```
dscli>chsession -dev storage_image_ID -lss LSS_ID -action remove -volume  
volume_ID session_ID
```

Example

```
dscli>chsession -dev IBM.1750-68FA120 -lss 10 -action remove  
-volume 0100-010F,0180-018F,0120 01
```

A confirmation message indicates that the session has been modified successfully.

Note: A volume ID range is defined by two volume IDs that are separated by a hyphen. Multiple volume IDs or volume ID ranges must be separated by a comma.

After the volumes have been removed from the Global Mirror session, you must end the volume associations for the removed volumes (FlashCopy, Global Copy pair, and remote mirror and copy path) if you plan to use the volumes in a different configuration.

Ending a Global Mirror session

Complete this task to end a Global Mirror session. In addition to ending a single session, this task is also the second step that you use when you remove the Global Mirror environment from your system.

Each session that you have created for Global Mirror processing must be ended individually. You cannot designate that a range of sessions be ended. Ending a session does not remove the volume or path associations. Each of these must be removed in their own way.

Perform the following steps to end a Global Mirror session. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **lsession** command to obtain a list of all sessions that are associated with the specified logical subsystem. Enter the **lsession** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsession -dev storage_image_ID -s LSS_ID
```

Example

```
dscli>lsession -dev IBM.1750-68FA120 -s 01
```

Note: For the circumstance described in this task, it is better to issue the **-s** parameter. The **-s** parameter creates a report with the following three items of information:

- LSSID
- Session number
- Volume numbers

2. Print the report or record the session numbers that need to be ended.
3. Issue the **rmsession** command to end the specified session. Enter the **rmsession** command at the dscli command prompt with the following parameters and variables:

```
dscli>rmsession -dev storage_image_ID -lss ID session_ID
```

Example

```
dscli>rmsession -dev IBM.1750-68FA120 -lss 10 01
```

4. Enter **Y** to respond to the message that requests that you confirm that you want to end the specified session. A message similar to the following is displayed when you process the **rmsession** command.

```
Are you sure you want to close Session ID 01? y/n Y
Global Mirror Session ID 01 closed successfully.
```

5. Repeat Step 3 for each session that you want to end.

Removing FlashCopy relationships

Complete this task to remove FlashCopy relationships that exist with the volumes that are part of your Global Mirror environment. In addition, this task is the third step in removing the Global Mirror environment from your system.

Ensure that the following tasks have been completed before invoking this step when you are removing your Global Mirror environment:

- Remove the volumes that are associated with each Global Mirror session you have closed.
- End the Global Mirror sessions that are part of your Global Mirror environment.

If you attempt to remove the FlashCopy relationships (as part of removing the Global Mirror environment) before doing the first two tasks, this task fails.

This task step only applies as part of the removal of your Global Mirror environment.

Note: Make certain that you no longer need your consistent set of data before you withdraw your relationships. If you still need your consistent data perform a backup data before proceeding with this task.

Perform the following steps to remove FlashCopy relationships that existed with the volumes that were part of your Global Mirror environment. The example commands in this task are shown in two formats. The first format shows the type of information the command requires. The second format provides the command with declared values for the variables.

1. Issue the **lsflash** command to check the status information for each FlashCopy relationship at the remote site. A detailed report (when you use the **-l** parameter) is displayed for each FlashCopy relationship. Enter the **lsflash** command at the dscli command prompt with the parameters and variables shown as follows:

```
dscli>lsflash -dev storage_image_ID -l SourceVolumeID:TargetVolumeID.
```

```
dscli>lsflash -dev IBM.1750-68FA150 -l 0100:0100
```

Use the **-l** parameter to provide a more detailed report about the FlashCopy relationships.

Note: If you originally used the **mkremoteflash** command to create your FlashCopy relationships, you must enter the **lsremoteflash** command to perform a status check.

2. Analyze the list of volumes that have been part of your Global Mirror environment and ensure that these are the volumes from which the FlashCopy relationship must be removed.
3. Issue the **rmflash** command to remove the FlashCopy volume relationships. Enter the **rmflash** command at the dscli command prompt with the parameters and variables shown as follows:

```
dscli>rmflash -dev storage_image_ID SourceVolumeID:TargetVolumeID
```

Example

```
dscli>rmflash -dev IBM.1750-68FA120 0001:0004 0003:00FF 0008:000C
```

Note:

- The example shows the use of multiple FlashCopy pair IDs. Ensure that you separate multiple FlashCopy pair IDs with spaces.
 - If you used the **mkremoteflash** command to create your FlashCopy relationships, you must enter the **rmremoteflash** command to remove the FlashCopy relationships.
4. Enter **Y** in response to each message that requests that you confirm that you want the specified FlashCopy pair removed. A message similar to the following appears for each FlashCopy pair being removed when you process the **rmflash** command.

```
Are you sure you want to remove the FlashCopy pair 0001:0004? [y/n]: Y
```

```
FlashCopy pair 0001:0004 successfully removed.
```

Removing the Global Copy pair relationship

Complete this task to remove Global Copy relationships that existed with the volumes that were part of your Global Mirror environment. This task is the fourth step in removing the Global Mirror environment from your system.

Ensure that you have completed the following tasks before you initiate this task; otherwise, this task fails:

- Remove the volumes that are associated with each Global Mirror session that you have closed.
- End the Global Mirror sessions that are part of your Global Mirror environment.
- Remove FlashCopy relationships that exist with the volumes that were part of your Global Mirror environment.

The purpose of this task is to remove the Global Copy relationships for each pair of source volumes on your primary site and the target volumes on your secondary site. There might be several LSSs that are involved and the Global Copy relationships must be removed within each LSS. This requires that you issue the **rmpprc** command for each LSS until all relationships are removed.

Perform the following steps to remove Global Copy pair relationships that exist with the volumes that were part of your Global Mirror environment. The example commands in this task are shown in two formats. The first format shows the type of information the command requires. The second format provides the command with declared values for the variables.

1. Issue the **lspprc** command to check the status information for each Global Copy volume relationship in the list. Enter the **lspprc** command at the dscli command prompt with the parameters and variables shown as follows:

```
dscli>lspprc -dev storage_image_ID -remotedev storage_image_ID -l  
SourceVolumeID:TargetVolumeID.
```

Example

```
dscli>lspprc -dev IBM.2107-68FA120 -remotedev IBM.2107-68FA150 -l 0100:0100
```

Use the **-l** parameter to provide a more detailed report about the Global Copy volume relationships.

2. Analyze the list of volumes that have been part of your Global Mirror environment, and ensure that these are the volumes from which the Global Copy relationships must be removed.

3. Issue the **rmpprc** command to remove the Global Copy volume relationships. Enter the **rmpprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>rmpprc -dev storage_image_ID -remotedev storage_image_ID
SourceVolumeID:TargetVolumeID
```

Example

```
dscli>rmpprc -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150 0100:0100
```

4. Enter **Y** in response to each message to confirm that you want to remove the specified Global Copy pair. A message similar to the following is displayed for each Global Copy pair that is being removed when you process the **rmflash** command.

```
Are you sure you want to remove PPRC pair 0100:0100? [y/n]: Y
```

```
Remote Mirror and Copy pair IBM.1750-68FA120/0100:0100
successfully removed.
```

5. Repeat Steps 3 and 4 for all the volumes that have Global Copy relationships in the LSSs that were part of your Global Mirror environment.

Removing the fibre-channel paths

Complete this task to remove the fibre-channel paths between all Global Mirror source and target pairs and between the master and subordinate storage units. This is the fifth and final step in removing the Global Mirror environment from your system.

Ensure that you have completed the following tasks before you initiate this task; otherwise, this task fails:

- Remove the volumes that are associated with each Global Mirror session that you have closed.
- Close the Global Mirror sessions that are part of your Global Mirror environment.
- Remove FlashCopy relationships that exist with the volumes that were part of your Global Mirror environment.
- Remove the Global Copy relationships that exist with the volumes that were part of your Global Mirror environment.

Repeat the process to remove the fibre-channel paths for each data path and for each control path. Data paths consists of source LSSs on the storage images at the primary site and target LSSs on the storage images at the secondary site. Control paths consist of the master storage image LSS and the subordinate storage image LSSs.

Perform the following steps to remove the fibre-channel paths between all Global Mirror source and target pairs and between the master and subordinate storage units. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **lspprcpath** command to display a list of existing remote mirror and copy path definitions. Enter the **lspprcpath** command at the dscli command prompt with the following parameters and variables:

```
dscli>lspprcpath -dev storage_image_ID source_LSS_ID
```

Example

```
dscli>lspprcpath -l -dev IBM.1750-68FA120 01
```

Note: The report that is displayed from this command provides the worldwide node name that is used with the **rmpprcpath** command.

2. Record the path information to use when you issue the **rmpprcpath** command.
3. Issue the **rmpprcpath** command to remove the fibre-channel paths between all Global Mirror source and target pairs and between the master and subordinate storage units. Do this for each path that must be removed. Enter the **rmpprcpath** command at the dscli command prompt with the following parameters and variables:

```
dscli>rmpprcpath -dev storage_image_ID -remotedev storage_image_ID
-remotewwnn wwnn source_LSS_ID:target_LSS_ID
```

Example

```
dscli>rmpprcpath -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150
-remotewwnn 12341234000A000F 01:01
```

4. Enter **Y** in response to each message to confirm that you want to remove the specified remote mirror and copy path. A message similar to the following is displayed for each remote mirror and copy path that is being removed.

```
Are you sure you want to delete the Remote Mirror and Copy path
(whatever was designated)? [y/n]: Y
```

Remote Mirror and Copy path (designated in the command) successfully deleted.

Note: Use of the **-quiet** parameter with the **rmpprcpath** command turns off the confirmation question for each path that is being removed.

5. Repeat Step 3 for all the remote mirror and copy paths per LSS that were part of your Global Mirror environment.

After this task is complete, you can create your new Global Mirror environment and configuration.

Chapter 10. Recovering from a disaster using Global Mirror

This task lists the high-level steps that you must complete in order to recover from a disaster using Global Mirror processing.

A failure at the local or primary site stops all I/O to and from the local storage server. The local server cannot communicate with the remote sites. This might impact the formation of consistency groups, because the entire process is managed and controlled by the master storage server, which is the primary storage server.

Your initial goal is to swap operations between the local and remote sites and then restart the applications. This requires that you make available a set of consistent volumes at the remote site, before the application can restart at the remote site.

When the local site is operational again, you want to return processing to the local site. Before you can return processing to the local site, you must apply changes from the remote site to the local site. These changes are the transactions that occurred after you started failover processing to the remote site.

The following considerations can help you determine where transactions are being processed:

- The **local site** contains A volumes (the source volume), which are copied to the recovery site using Global Copy
- The **recovery (or remote) site** contains B volumes (the target volume and FlashCopy source volume) and C volumes (the FlashCopy target volume)
- A storage unit at the local site is designated as the Global Mirror master and all other local (or production) storage units are designated as subordinate storage units. The master storage unit sends commands to its subordinate storage units. These subordinates work together to create a consistency group and to communicate the FlashCopy commands to the recovery (or remote) site. All status is relayed back to the Global Mirror master.

To recover from a disaster, you must perform the following high-level tasks using the Global Mirror function and the DS CLI commands:

1. End Global Mirror processing when a disaster occurs.
See *“Ending Global Mirror processing when a disaster occurs”* on page 162 for additional substeps.
2. Check the status of the current processing for Global Mirror transactions. See *“Checking Global Mirror transaction status in a disaster situation”* on page 163 for additional substeps.
3. Initiate the failover process of A volumes to B volumes. See *“Initiating failover processing for B volumes to A volumes”* on page 164 for additional substeps.
4. Analyze the consistency group status. See *“Analyzing and validating the consistency group state”* on page 165 for additional substeps.
5. Use the **revertflash** command to correct FlashCopy relationships. See *“Using the revertflash command to correct FlashCopy relationships”* on page 167 for additional substeps.
6. Use the **commitflash** command to correct FlashCopy relationships. See *“Using the commitflash command to correct FlashCopy relationships”* on page 168 for additional substeps.

7. Initiate the fast reverse restore process. See *"Using fast reverse restore processing to create consistency"* on page 169 for additional substeps.
8. Wait for the background copy to complete. See *"Waiting for the background copy to complete"* on page 170 for additional substeps.
9. Reestablish the FlashCopy relationships, B volumes to C volumes. See *"Reestablishing the FlashCopy relationships between B volumes and C volumes"* on page 171 for additional substeps.
10. Prepare to reinstate production at the local site. See *"Preparing to reinstate production at the local site"* on page 172 for additional substeps.
11. Resynchronize the volumes. See *"Resynchronizing the volumes"* on page 173 for additional substeps.
12. Query for first pass and drain time out-of-synch zero value and quiesce your system. See *"Querying, quiescing, and querying"* on page 174 for additional substeps.
13. Reestablish the remote mirror and copy paths, A site to B site. See *"Reestablishing remote mirror and copy paths (site A to site B)"* on page 175 for additional substeps.
14. Perform Global Copy failover processing to the A volumes. See *"Performing Global Copy failover processing to the A volumes"* on page 177 for additional substeps.
15. Perform Global Copy failback processing for the A volumes. See *"Performing Global Copy failback processing for the A volumes"* on page 177 for additional substeps.
16. Resume Global Mirror processing at site A. See *"Resuming Global Mirror processing at site A"* on page 178 for additional substeps.

Ending Global Mirror processing when a disaster occurs

Complete this task to end Global Mirror processing when a disaster occurs. This is the first step in the Global Mirror disaster recovery process.

Depending on the state of the local Global Mirror storage server, you might have an opportunity to end Global Mirror processing before you can initiate the rest of the recovery steps. Generally, a disaster affects your local server and your choices for ending Global Mirror processing in one of the following ways:

- Your site experiences a rolling disaster and your Global Mirror processing is not being done through a DS CLI script. This circumstance allows you time to issue a pause command, followed by a query command, and then an end Global Mirror processing command.

Note: If the query displays a status of Fatal or a null (-), you must analyze and correct your consistency groups during the recovery process. If the query displays a status of Paused, your consistency groups are formed before you end Global Mirror processing.

- Your site experiences a rolling disaster and your Global Mirror processing is being done through a DS CLI script. You can take a chance that you have enough time to allow the script to process to the end. However, it is likely that you must end Global Mirror processing by pressing the **CTRL C** buttons on your keyboard because there is no pause feature when running a script.
Because this is a rolling disaster, you might have time to log back into your DS CLI session on the local server and query the status of the Global Mirror processing before it was ended.

- Your sites' local server is affected by the disaster immediately and you have no time to end Global Mirror processing or issue a status query.

If possible, you want to end Global Mirror processing. Perform the following step to end Global Mirror processing.

Issue the **rmgmir** command to end Global Mirror processing or press the **CTRL C** buttons when you are using a DS CLI script and then issue the **rmgmir** command.

After Global Mirror processing has been ended, you are ready for the next step in the Global Mirror failover recovery process.

Checking Global Mirror transaction status in a disaster situation

Complete this task to check the status of your Global Mirror transactions before processing ends as a result of a disaster. Normally, this is the second step in the Global Mirror failover recovery process because in a rolling disaster, your primary server is still operational. This might be the first step if your primary server is not operational.

You must end Global Mirror processing before you can initiate this task.

You must determine the status of the Global Mirror processing before processing was ends. Some transactions might be half completed while others are not yet started. Querying the status of your transactions provides a basis for planning which tasks must be done next. The situation you face is similar to one of the following conditions:

- When Global Mirror processing ends, the formation of a consistency group is in progress and the FlashCopy state between the B and the C volumes in the remote storage server is not the same for all relationships.
- Some FlashCopy pairs might have completed the FlashCopy phase of Global Mirror processing to form a new consistency group and might have already committed the changes.
- Some FlashCopy pairs might not have completed and are in the middle of processing to form their consistent copy and remain in a revertible state.
- There is no master server that controls and coordinates the processing that might continue for a brief period at the remote site.

Perform the following steps to obtain an initial status of your transactions.

1. If your primary server is still operational, issue the **lsession** and **lspprc** commands to obtain reports that allow you to determine the status of your Global Mirror transactions. If your primary server is not available, go to the next step.
2. Gain access to your remote server and navigate to the directory where you installed the DS CLI application.
3. Log in to a DS CLI session.
4. Issue the **lspprc** command to provide a report that allows you to determine the status of your Global Mirror transactions.

Enter the **lspprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>lspprc -dev storage_image_ID -remotedev storage_image_ID -l
SourceVolumeID:TargetVolumeID
```

Example

```
dscli>lspprc -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150 -l
0100-0103:0100-0103 0200:0200 0300-0303:0300-0303
```

Note: The report displays your Global Copy pairs with a suspended state.

After you obtain your reports, you are ready for the next step in the Global Mirror disaster recovery process, which is to issue the failover command.

Initiating failover processing for B volumes to A volumes

Complete this task to perform failover processing for B volumes to A volumes so that the B volumes become the primary volumes and A volumes become the secondary volumes. The Global Copy state of the B volumes changes from secondary to primary and suspended. This is the next step after you obtain a status of your Global Mirror transactions in the Global Mirror failover recovery process.

The failover task cannot be done unless you have completed the following:

- Ended Global Mirror processing
- Obtained the reports that help you determine the status of your Global Mirror transactions before the disaster occurred

Recovery failover processing on the Global Copy volume pair ends the A-to-B volumes extended distance relationship and instead creates a B-to-A volume Global Copy relationship. Therefore, failover processing to the Global Copy secondary volume turns the secondary volumes into primary volumes and immediately suspends these volumes. Because the B volumes are the now the primary volumes and the A volumes are now the secondary volumes, the Global Copy state of the secondary volumes has changed from Target Copy Pending to Suspended.

To initiate failover processing of the B volumes to the A volumes, perform the following step. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

Issue the **failoverpprc** command to change the Global Copy state on the B volumes from secondary, target pending to primary, suspended. Enter the **failoverpprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>failoverpprc -dev storage_image_ID -remotedev storage_image_ID
SourceVolumeID:TargetVolumeID
```

Example

```
dscli>failoverpprc -dev IBM.1750-68FA150 -remotedev IBM.1750-68FA120
0100:0100 0101:0101 0102:0102 0103:0103
```

Note: Unlike most other commands, the *storage_image_ID* and *SourceVolumeID:TargetVolumeID* values are reversed for the **failoverpprc** command, because the command is issued directly to the remote server. You must place the values for the remote server first and the values for the original primary server second. This reversal (where the remote server is no longer the primary server) can have the following results:

- The source volumes become suspended

- The target volumes become suspended and they are available for mounting

An information message like the following one is generated for each Global Copy pair that is changed and moved to a suspended state.

Remote Mirror and Copy pair IBM.1750-68FA150/0100:IBM.1750-68FA120/0100 successfully suspended.

All B volumes must successfully process the **failoverpprc** command before you can move on to the next step which involves analyzing the FlashCopy relationships and initiating the appropriate commands.

Analyzing and validating the consistency group state

Complete this task to analyze and validate the consistency group state. This is the fourth step in the Global Mirror failover recovery process.

Before you can initiate this task, you must ensure that the following tasks have been completed:

- Global Mirror processing has been ended at the primary server site.
- The status of Global Mirror transaction processing before the disaster caused the process to end has been obtained.
- Failover processing from B volumes to A volumes has completed with the B volumes state being changed from a secondary, target pending state to a primary, suspended state.

The consistency group state must be validated. This means that you must investigate whether all FlashCopy relationships are in a consistent state. Query the FlashCopy relationships that exist between B volumes and C volumes to determine the state of the FlashCopy relationship at the time that the primary server experienced a failure. Global Mirror might have been in the middle of forming a consistency group and FlashCopy might not have completed so as to create a complete set of consistent C volumes.

When you query a FlashCopy pair, there are two key pieces of information, that determine whether the C volume set is consistent or needs intervention to correct some states.

Revertible status

The revertible status is indicated as Enable or Disable and shows whether the FlashCopy is revertible or nonrevertible. A nonrevertible state means that a FlashCopy process has completed successfully and all changes are committed.

Sequence number

The sequence number indicates the number of the actual or last FlashCopy process (if the FlashCopy process is finished).

There are some combinations of revertible states and FlashCopy sequence numbers that require different corrective actions; this is, what you are looking for when you do your analysis.

Perform the following steps to analyze and validate the consistency group state. The example command displayed in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **lsflash** command to provide a report that lists the FlashCopy relationships and status information for each FlashCopy relationship in the list. Enter the **lsflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsflash -dev storage_image_ID -l source_volume_ID:target_volume_ID
```

Example

```
dscli>lsflash -dev IBM.1750-68FA150 -l 0100:0200 0101:0201 0102:0202 0103:0203
```

Remember that at this point your remote server has become your primary server.

2. Analyze your report to determine the state of the consistency group between the B volume and C volume. You are looking primarily at the FlashCopy relationships and your analysis determines your next step in the recovery process.

The following provides the types of FlashCopy relationships that might exist and a reference to the action that must be taken:

- The FlashCopy relationships are nonrevertible and all the sequence numbers are equal. **Action:** No further action is necessary and the set of C volumes is consistent and a complete copy.
- The FlashCopy relationships are revertible and all the sequence numbers are equal. **Action:** Issue the **revertflash** command to revert the FlashCopy pairs to the last consistency group.
- All the FlashCopy sequence numbers are equal and at least one of the FlashCopy relationships is nonrevertible. **Action:** Issue the **commitflash** command to commit the data to a target volume to form a consistency group between the source and target.
- The FlashCopy relationships appear as follows:
 - a. Some of the FlashCopy relationships completed processing so that a consistent group was created. These FlashCopy relationships are no longer revertible.
 - b. Some of the FlashCopy relationships have not completed creating a new consistency group formation. They are still in a revertible state.
 - c. All the FlashCopy relationships have the same FlashCopy sequence number. This indicates that all the FlashCopy relationships were involved in the very same consistency group.

Action: Issue the **commitflash** command to commit the data of the FlashCopy relationships that have not completed creating a new consistency group so that a consistency group is formed.

- There is a group of FlashCopy pairs that are all revertible and another group of FlashCopy pairs that are all nonrevertible. In addition, all the FlashCopy sequence numbers are not equal. However, the following conditions exist:
 - a. The FlashCopy sequence number for all revertible pairs is equal.
 - b. The FlashCopy sequence number for all nonrevertible pairs is equal.

Action: Issue the **revertflash** command to revert the FlashCopy pairs to the last consistency group.

- The FlashCopy sequence numbers are not equal for all FlashCopy relationships in the concerned consistency group and either *a* or *b* in the previous bullet was not true. This indicates that the consistency group is corrupted. **Action:** Contact your IBM service representative.

Note: When you know the state of all the FlashCopy relationships, you might want to initiate a tape backup of the C volume.

After determining the state of the FlashCopy relationships, issue the **revertflash** or **commitflash** commands, as appropriate.

Using the revertflash command to correct FlashCopy relationships

Complete this task to correct the revertible states and FlashCopy sequence numbers that require the use of the DS CLI **revertflash** command. This is the fifth step in the Global Mirror failover recovery process unless your corrections require the use of the **commitflash** DS CLI command. In this case, the use of the **commitflash** command becomes your fifth step.

You can use the **revertflash** command only when your analysis of the FlashCopy relationships reveals one of the following conditions:

- The FlashCopy relationships are revertible and all the sequence numbers are equal.
- There is a group of FlashCopy pairs that are all revertible and another group of FlashCopy pairs that are all nonrevertible. In addition, all the FlashCopy sequence numbers are not equal. However, the following conditions exist:
 - The FlashCopy sequence number for all revertible pairs is equal.
 - The FlashCopy sequence number for all nonrevertible pairs is equal.

The revert action removes the FlashCopy relationship changes and resets them to the last consistency group state. The revertible state is set to No.

Perform the following step to correct the applicable FlashCopy relationships. The example command in this task is shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

Issue the **revertflash** command to correct the FlashCopy relationships and reset them to the last consistency group state. Enter the **revertflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>revertflash -dev storage_image_ID SourceVolumeID
```

Example

```
dscli>revertflash -dev IBM.1750-68FA150 0100
```

Notes:

1. Remember that the *storage_image_ID* is the value for the remote server that has been designated the primary server until the original primary server is available for use.
2. Global Mirror operations have performed the establish FlashCopy revertible processing as it was trying to form a consistency group before the disaster occurred. If your analysis, through use of the **lsflash** command, has determined that a **revertflash** command is needed, then there is no need to issue a new **mkflash** command.

A confirmation message like the following one is generated for each FlashCopy relationship that has been successfully reset.

FlashCopy pair 0100:0200 successfully reverted to the previous consistency.

After all the FlashCopy relationships have been corrected, you are ready to use the fast reverse restore process, which is the next step in the Global Mirror disaster recovery process.

Using the **commitflash** command to correct FlashCopy relationships

Complete this task to correct the revertible states and FlashCopy sequence numbers that require the use of the DS CLI **commitflash** command. This is the fifth step in the Global Mirror failover recovery process unless your corrections require the use of the **revertflash** DS CLI command. In this case, the use of the **revertflash** command becomes your fifth step.

You can use the **commitflash** command only when your analysis of the FlashCopy relationships reveals one of the following conditions:

- All the FlashCopy sequence numbers are equal and at least one of the FlashCopy relationships is nonrevertible.
- The FlashCopy relationships exist as follows:
 - Some of the FlashCopy relationships completed processing so that a consistent group has been created. These FlashCopy relationships are no longer revertible.
 - Some of the FlashCopy relationships have not completed creating a new consistency group formation. These FlashCopy relationships are still in a revertible state.
 - All the FlashCopy relationships have the same FlashCopy sequence number. This indicates that all the FlashCopy relationships belong in the same consistency group.

The commit action keeps a FlashCopy relationship in its current state and resets the revertible state to No. When the **commitflash** command is processed, the data in these relationships is committed to the consistency group to which it would have become a part before the disaster occurred.

Perform the following step to correct the applicable FlashCopy relationships. The example command in this task is shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

Issue the **commitflash** command to correct the FlashCopy relationships and commit them to the consistency group that was being formed before the disaster occurred. Enter the **commitflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>commitflash -dev storage_image_ID SourceVolumeID
```

Example

```
dscli>commitflash -dev IBM.1750-68FA150 0100
```

Notes:

1. Remember that the *storage_image_ID* is the value for the remote server that has been designated the primary server until the original primary server is available for use.
2. Global Mirror operations have performed the establish FlashCopy revertible processing as the Global Mirror operations were trying to form a consistency group before the disaster occurred. If your analysis,

through use of the **lsflash** command, has determined that a **commitflash** command is required, then there is no need to issue a new **mkflash** command.

A confirmation message like the following one is generated for each FlashCopy relationship that has been successfully reset.

FlashCopy pair 0100:0200 successfully committed.

After all the FlashCopy relationships have been corrected, you are ready to use the fast reverse restore process, which is the next step in the Global Mirror disaster recovery process.

Using fast reverse restore processing to create consistency

Complete this task to create the same consistent data on the B volumes that you have on the C volumes. The fast reverse restore option allows you to reverse a FlashCopy relationship without waiting for the background copy of a previous FlashCopy operation to finish. This is the sixth step in the Global Mirror disaster recovery process.

The fast reverse restore option reverses a FlashCopy target volume and allows consistent data to be copied back to its associated source volume, without having to wait for the background copy from the original source to the original target to complete. You can then vary the volumes online and start your applications.

Fast reverse restore processing creates a background copy of all tracks that changed on the B volume since the last consistency group formation. This results in the B volume becoming the same as the image that was present on the C volume. However, this process ends the FlashCopy relationship, so that the C volume is no longer usable.

Use the DS CLI **reverseflash** command with the **-fast** parameter to accomplish this task. This command results the following conditions:

- Start background copy from the C volumes to the B volumes.
- No change recording.
- There must be no I/O allowed to the B or C volumes during the fast reverse restore process.

Perform the following step to create the same consistent data on the B volumes that you have on the C volumes. The example command in this task is shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

Issue the **reverseflash** command to create the same consistency on the B volumes that you have on the C volumes. Enter the **reverseflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>reverseflash -dev storage_image_ID -fast -tgtpprc  
source_volume_ID:target_volume_ID
```

Example

```
dscli>reverseflash -dev IBM.1750-68FA150 -fast -tgtpprc  
0200:0100
```

Notes:

1. The **-fast** parameter determines that the **reverseflash** command is processed before the background copy completes.
2. The source volume ID is the value that is specified for the C volume. The data from this volume is copied to the target volume ID, which is the B volume.
3. The **-tgtpprc** parameter allows the FlashCopy target volume (B volume) to be a Remote Mirror and Copy source volume.
4. The *storage_image_ID* parameter is the value that is assigned to the remote storage unit, which has become the primary storage unit as a result of the failover action.
5. You must wait for the background copy to complete before you can go on to the next process.

Waiting for the background copy to complete

Complete this task to determine when all fast reverse restore operations are complete and when no more FlashCopy relationships exist between the B volumes and the C volumes. This is the seventh step in the Global Mirror disaster recovery process.

The fast reverse restore operations complete the data transfer from the C volumes to the B volumes. However, before you can proceed with any additional steps, the background copy must complete. When the background copy is completed, FlashCopy relationships no longer exist between the B volumes and C volumes. Also, the C volume is no longer usable. Both of these operations must complete before you can move on in the disaster recovery process.

The best way to determine if these operations are complete is to periodically issue the **lsflash** command against the B volumes to query the existence of FlashCopy relationships.

Perform the following steps to determine that no FlashCopy relationships exist between the B volumes and the C volumes. The example command in this task is shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **lsflash** command to check the existence of FlashCopy relationships between the B volume and the C volume. Enter the **lsflash** command at the dscli command line prompt with the following parameters and variables:

```
dscli>lsflash -dev storage_image_ID -s target_volume_ID
```

Example

```
dscli>lsflash -dev IBM.1750-68FA150 -s 0200
```

Notes:

- a. The *storage_image_ID* is the manufacture, storage unit type, and serial number value of the remote storage unit that has become the primary unit because of the disaster.
- b. The **-s** parameter limits the report information that is returned only to the FlashCopy pair relationships that still exist.
- c. By designating only the target volume ID, you are further limiting the report to display just the target side of the FlashCopy pair relationship. When the report returns a blank screen, it indicates that

background copy has completed and that no FlashCopy relationships exist between the B volume and the C volume.

2. Repeat Step one periodically until no FlashCopy relationships exist between the B volume and the C volume.

After the fast reverse restore and the background copy operations have completed, you can proceed to the next task which is reestablishing the FlashCopy relationship between the B volume and the C volume.

Reestablishing the FlashCopy relationships between B volumes and C volumes

Complete this task to reestablish the FlashCopy relationships between your B volumes and C volumes. This is the eighth step in using the Global Mirror disaster recovery process.

In this task, you are reestablishing the FlashCopy relationships between the B volumes and C volumes that were established for Global Mirror operations before the disaster occurred. The task is not much different than the one that you used to establish FlashCopy relationships during the set up of your Global Mirror environment.

Perform the following steps to create FlashCopy relationships between the B volumes and the C volumes. The example command in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **mkflash** command to create FlashCopy relationships at the remote site between the Global Copy secondary volumes and the FlashCopy target volumes. Enter the **mkflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkflash -dev storage_image_ID -tgtinhibit -persist -record -nocp  
sourcevolumeID:targetvolumeID
```

Example

```
dscli>mkflash -dev IBM.1750-68FA150 -tgtinhibit -record  
-persist -nocp 0001:0004
```

Notes:

- a. Specify the secondary storage unit MTS (which has become the primary storage unit because of the disaster) for the **-dev *storage_image_ID*** parameter.
 - b. Use the **-tgtinhibit** parameter to inhibit writes on the target volume.
 - c. Use the **-record** parameter to activate change recording on the volume pair.
 - d. Use the **-persist** parameter to retain the FlashCopy relationship after the background copy completes.
 - e. Use the **-nocp** parameter to inhibit the background copy.
 - f. The *source_volume_ID* is the value associated with the B volumes and the *target_volume_ID* is the value associated with the C volumes.
2. Use the **lsflash** command to check the status of the FlashCopy relationships after you have processed the **mkflash** command.

After you have reestablished the FlashCopy relationships, you can start host I/O processing at the remote site on the B volumes. The production operation on the remote site, in this configuration, remains until you are ready to return production to the local site.

Preparing to reinstate production at the local site

Complete this task to begin the process of returning production to your local site. Just as there was a series of steps in the failover recovery process to your remote site, there are a series of steps that you must take to return production to your local site.

Returning production to its original implementation is called a failback recovery. After restoring operations at Site A, you can schedule a failback operation to synchronize data and to enable production to resume at your original site, Site A.

This task is initiated when your local site has been repaired and is operational. The first step in returning production to site A is to create fibre-channel paths between Site B to Site A and between the specific LSSs.

Perform the following steps to create fibre-channel paths from Site B to Site A and between the specific LSSs. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with values declared for the variables.

Note: Before you can establish the paths, you must obtain the worldwide node name that is associated with the remote storage unit. In this task your remote storage unit is your local storage unit (Site A).

1. Issue the **lssi** command against the Site A storage unit to obtain its worldwide node name. A report is displayed that provides the specific information about the Site A storage unit. Enter the **lssi** command at the dscli command prompt with the following parameters and variables:

```
dscli>lssi -l storage_image_ID
```

Example

```
dscli>lssi -l IBM.1750-68FA120
```

Record the worldwide node name because it is used in the next step.

2. Issue the **mkpprcpath** command to create the fibre-channel paths from Site B to Site A and between the specific LSSs. Enter the **mkpprcpath** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkpprcpath -dev storage_image_ID -remotedev storage_image_ID  
-remotewwnn wwnn -src1ss source_LSS_ID -tgt1ss target_LSS_ID  
          source_port_ID:target_port_ID
```

Example

```
dscli>mkpprcpath -dev IBM.1750-68FA150 -remotedev  
IBM.1750-68FA120 -remotewwnn 12341234000A000A  
-src1ss 00 -tgt1ss 01  
I1A20:I2A10
```

Notes:

- a. The **-dev** parameter specifies the ID of your source storage unit. At this point in time, your source is the Site B storage unit.

- b. The **-remotedev** parameter specifies the ID of the secondary storage unit. At this point in time, the remote storage unit is your Site A storage unit.
- c. The **-remotewwnn** parameter must specify the worldwide node name of the secondary storage unit (Site A at this point in time). If you specify the worldwide node name of the primary storage unit (Site B), the command fails.
- d. The **-srcLSS** parameter refers to Site B storage unit as the source.
- e. The **-tgtLSS** parameter specifies the Site A storage unit as the target.
- f. The **source_port_ID:target_port_ID** value has the Site B port ID as the source and the Site A port ID as the target.

After you have established the paths, you are ready to move on to the second step on the failback recovery process which involves issuing the **failbackpprc** command from the B volume to the A volume.

Resynchronizing the volumes

Complete this task to resynchronize the volumes, B volumes to A volumes. This is the second step in the failback recovery process that allows production to be returned to your A site.

Before you can do this task, you must ensure that you have created paths from Site B to Site A between the specific LSSs.

This task requires the use of the **failbackpprc** command. Processing this command resynchronizes the volumes in the following manner depending on the volume state:

- If a volume at Site A is in simplex state, all of the data for that volume is sent from Site B to Site A.
- If a volume at Site A is in full-duplex or suspended state and without changed tracks, only the modified data on the volume at Site B is sent to the volume at Site A.
- If a volume at Site A is in a suspended state but has tracks that have been modified, the volume at Site B will discover which tracks were modified at any site and send both the tracks that were changed on Site A and the tracks that were marked at Site B from Site A to Site B.

Perform the following step to resynchronize your volumes. The example commands displayed in this task are shown in two formats. The first format shows the type of information the command requires. The second format provides the command with declared values for the variables.

Note: This task does not affect normal operations. All your operations remain at the remote site (Site B). This task is just part of the preparation you need to make to transfer operations back to Site A after it has been repaired.

Issue the **failbackpprc** command to resynchronize your volumes. Enter the **failbackpprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>failbackpprc -dev storage_image_ID -remotedev storage_image_ID
-type gcp source_volume_ID:target_volume_ID
```

Example

```
dscli>failbackpprc -dev IBM.1750-68FA150 -remotedev IBM.1750-68FA120  
-type gcp 1000:1000
```

Notes:

1. The **-dev** parameter specifies the ID of your source storage unit. At this point in time, your source is the Site B storage unit.
2. The **-remotedev** parameter specifies the ID of the target storage unit. At this point in time, the remote storage unit is your Site A storage unit.
3. The *source_volume_ID:target_volume_ID* value has the Site B volume ID as the source and the Site A volume ID as the target.

After submitting this command for processing, you must track the progress of the transaction until it completes its first pass. So, querying for first pass completion is the next step in the failback recovery process.

Querying, quiescing, and querying

Complete this task series to query for the first pass of the out-of-sync bitmap completion, to quiesce your system, and to complete the query process to ensure that the out-of-sync tracks equal 0. This series of tasks is the third step in the failback recovery process that allows production to be returned to your A site.

To perform this series of tasks, you must ensure that you have resynchronized the volumes, B volumes to A volumes.

This series of tasks requires the use of the **lspprc** command and that you quiesce your system.

Perform the following steps to complete the third step of the failback recovery process. The example commands in this task are shown in two formats. The first format shows the type of information that the command requires. The second format provides the command with declared values for the variables.

1. Issue the **lspprc** command periodically to identify when the first pass of the out-of-sync (OOS) bitmap completes. Depending on the number of transactions that you have, some period of time elapses. Enter the **lspprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>lspprc -dev storage_image_ID -remotedev storage_image_ID -l  
SourceVolumeID:TargetVolumeID
```

Example

```
dscli>lspprc -dev IBM.1750-68FA150 -remotedev IBM.1750-68FA120  
1000:1000
```

Notes:

- a. The **-dev** parameter specifies the ID of your source storage unit. At this point, your source is the Site B storage unit.
 - b. The **-remotedev** parameter specifies the ID of the target storage unit. At this point, the remote storage unit is your Site A storage unit.
 - c. The *source_volume_ID:target_volume_ID* value has the Site B volume ID as the source and the Site A volume ID as the target.
2. Quiesce your I/O and unmount your file systems at the B site to preserve the integrity of your file system.

Note: Unmounting your file systems flushes the host cache and ensures that you actually copy valid data sets.

3. Reissue the **"lspprc" on page 444** command periodically to identify when the remaining bits completely drain from the B site. This is indicated when the out-of-sync (OOS) tracks equal zero. Depending on the number of transactions that you have, some period of time elapses. Enter the **lspprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>lspprc -dev storage_image_ID -remotedev storage_image_ID -l  
SourceVolumeID:TargetVolumeID
```

Example

```
dscli>lspprc -dev IBM.1750-75FA150 -remotedev IBM.1750-75FA120  
1000:1000
```

After this task is completed, you are ready to establish the remote mirror and copy paths from Site A to Site B.

Reestablishing remote mirror and copy paths (site A to site B)

Complete this task to reestablish the remote mirror and copy paths between site A and site B in preparation for the transfer of operations from the B site to the A site. This is the fourth step in the failback disaster recovery process.

Each of the prior tasks must be completed in sequence in order for this task to succeed.

This task is similar to when you initially created your remote mirror and copy paths as part of setting up your Global Mirror environment, before the disaster occurred.

Create paths so that the logical subsystems (LSSs) are associated with each other. These are the ports that the copy services I/O pass through. It is preferred that they are not the same ports that are used for host I/O. This ensures that there is enough capacity for the data transfer.

Perform the following steps to create remote mirror and copy paths between all Global Mirror source and target pairs and between the master and subordinate storage units. The example commands in this task are shown in two formats. The first format shows the type of information that is required by the command. The second format provides the command with declared values for the variables.

1. Obtain the worldwide node name of the secondary storage unit. This information is needed when you do the next step. Enter the **lssi** or **showsi** at the dscli command prompt as follows:

```
dscli>lssi -l
```

This is the entire command. No additional variables are needed.

The **showsi** command does contain a variable and a command flag:

```
dscli>showsi storage_image_id -fullid
```

Example

```
dscli>showsi -fullid IBM.1750-68FA120
```

Notes:

- a. Use the **lssi** command if you want to display a list of all the storage image instances for a storage complex and the status information for each storage image in the list.

- b. Use the **shows**i command if you want to display the detailed properties of a specific storage unit.
 - c. Use the **-fullid** DS CLI command flag with the **shows**i command to display fully qualified IDs, which include the storage image ID, for every ID that is displayed in the command output.
 - d. Record the worldwide node name for the secondary (target) site B storage unit so that you can use it when you issue the **mkpprcpath** command.
2. Issue the **mkpprcpath** command to create the remote mirror and copy paths between all Global Mirror source and target pairs and between the master and subordinate storage units. Enter the **mkpprcpath** command at the dscli command prompt with the following parameters and variables as follows:
- ```
dscli>mkpprcpath -dev storage_image_ID -remotedev storage_image_ID
-remotewwnn wwnn -srclss source_LSS_ID -tgtlss target_LSS_ID
source_port_ID:target_port_ID
```

#### Example

```
dscli>mkpprcpath -dev IBM.1750-68FA120 -remotedev
IBM.1750-68FA150 -remotewwnn 12341234000A000F
-srclss 00 -tgtlss 01 I1A10:I2A20
```

#### Notes:

- a. The **-remotedev** parameter specifies the ID of the secondary storage unit.
- b. The **-remotewwnn** parameter must specify the worldwide node name of the secondary storage unit. If you make a mistake and specify the worldwide node name of the primary storage unit, the command fails.
- c. The shortened version of the **-src~~l~~ss** parameter is shown (value = 00) because the example uses the fully qualified **-dev *storage\_image\_ID*** parameter. If the fully qualified **-dev** parameter is not used, you must use the fully qualified **-src~~l~~ss *source\_LSS\_ID*** value. For example: **-src~~l~~ss IBM.1750-68FA120/00**.
- d. The shortened version of the **-tgt~~l~~ss** parameter is shown (value = 01) because the example uses the fully qualified **-dev *storage\_image\_ID*** parameter. If the fully qualified **-dev** parameter is not used, you must use the fully qualified **-tgt~~l~~ss *target\_LSS\_ID*** value. For example: **-tgt~~l~~ss IBM.1750-68FA120/01**.
- e. The shortened version of the ***source\_port\_ID:target\_port\_ID*** parameter is shown (value = I1A10:I2A20) because the example uses the fully qualified **-dev *storage\_image\_ID*** and **-remotedev *storage\_image\_ID*** parameters. If the fully qualified **-dev** and **-remotedev** parameters are not used, you must use the fully qualified ***source\_port\_ID:target\_port\_ID*** value. For example: **IBM.1750-68FA120/I1A10:IBM.1750-68FA150/I2A20**.

The fully qualified ***source\_port\_ID:target\_port\_ID*** parameter is positional on your command line. It must be placed after the **-tgt~~l~~ss** parameter and value. For example:

```
dscli>mkpprcpath -srclss 00 -tgtlss 01
IBM.1750-68FA120/I1A10:IBM.1750-68FA150/I2A20
```

---

## Performing Global Copy failover processing to the A volumes

Complete this task to perform failover processing from A volumes to B volumes so that the A volumes become the primary volumes and B volumes become the secondary volumes. This is the fifth step in the failback recovery process.

The resynchronization of the A volumes and B volumes must be completed (no out-of-sync tracks) before you can proceed with this task.

You must issue this restore failover request on the Global Copy volumes pair to reestablish the extended distance relationship and create the A Volume to B Volume Global Copy relationship.

Perform the following step to complete failover processing from the A volumes to the B volumes. The example commands in this task are shown in two formats. The first format shows the type of information that is required by the command. The second format provides the command with declared values for the variables.

Issue the **failoverpprc** command to reestablish the extended distance relationship and create the A Volume to B Volume Global Copy relationship. Enter the **failoverpprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>failoverpprc -dev storage_image_ID -remotedev storage_image_ID
 -type gcp SourceVolumeID:TargetVolumeID
```

### Example

```
dscli>failoverpprc -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150
 -type gcp 0100:0100 0101:0101 0102:0102 0103:0103
```

**Note:** The SourceVolume\_ID is the A volume and the TargetVolume\_ID is the B volume.

A confirmation message like the following is generated for each Global Copy pair that has been changed and moved to a state of suspended.

```
PPRC pair IBM.1750-68FA120/0100:IBM.1750-68FA150/0100 successfully
suspended.
```

**Note:** All A volumes must successfully process the **failoverpprc** command before you can move on to the next step.

---

## Performing Global Copy failback processing for the A volumes

Complete this task to perform Global Copy failback processing for the A volumes. This process resynchronizes the volumes at Site A with volumes at Site B and restarts mirroring from site A (local site) to site B (remote site). This is the sixth step in the failback recovery process.

The failover processing that is described in the fifth step of the failback recovery process must have completed. The failover process converted the full-duplex target volumes at site A to suspended source volumes. The volumes at site A started the change recording process while in failover mode.



The failback processing that is described in this task can be issued against any remote mirror and copy volume that is in a primary suspended state. The failback processing copies the required data from the source volume to the target volume in order to resume mirroring.

Perform the following step to complete failback processing for the A volumes. The example commands in this task are shown in two formats. The first format shows the type of information that is required by the command. The second format provides the command with declared values for the variables.

Issue the **failbackpprc** command to resynchronize your volumes. Enter the **failbackpprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>failbackpprc -dev storage_image_ID -remotedev storage_image_ID
-type gcp SourceVolume_ID:TargetVolume_ID
```

#### Example

```
dscli>failbackpprc -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150
-type gcp 1000:1000
```

#### Notes:

1. The **-dev** parameter specifies the ID of your source storage unit. Your source is the Site A storage unit.
2. The **-remotedev** parameter specifies the ID of the target storage unit. The remote storage unit is your Site B storage unit.
3. The *SourceVolume\_ID:TargetVolume\_ID* value has the Site A volume ID as the source and the Site B volume ID as the target.

---

## Resuming Global Mirror processing at site A

Complete this task to start or resume Global Mirror processing at the A site. This is the final step in the failback recovery process.

Site A has been repaired and connectivity reestablished with your remote site. You have followed all the prior steps in sequence and are ready to start up I/O processing from your local site.

Perform the following steps to start or resume Global Mirror processing. The example commands in this task are shown in two formats. The first format shows the type of information that is required by the command. The second format provides the command with declared values for the variables.

1. Issue the **mkgmir** command to start Global Mirror processing. Enter the **mkgmir** command at the dscli command prompt using the following parameters and variables:

```
mkgmir -dev storage_image_ID -lss LSS_ID -cginterval seconds
-coordinate milliseconds -drain seconds -session session_ID
Master_Control_Path_LSS_ID:Subordinate_Control_Path_LSS_ID
```

#### Example

```
dscli>mkgmir -dev IBM.2107-75FA120 -lss 10 -cginterval 0 -coordinate 50
-drain 30 -session 01 IBM.2107-75FA120/00:IBM.2107-75FA150/00
```

**Note:** Issuing the **mkgmir** command requires that you specify the tuning parameters. The values for the tuning parameters are not retained when you end Global Mirror processing. So, in the case where you need to



change the Global Mirror topology parameters, you need to resubmit the tuning parameters when you restart Global Mirror processing.

2. Issue the **resumegmir** command to continue Global Mirror processing after you have paused Global Mirror processing. Enter the **resumegmir** command at the dscli command prompt using the following parameters and variables:

```
dscli>resumegmir -dev storage_image_ID -lss LSS_ID -session session_ID
Master_Control_Path_LSS_ID:Subordinate_Control_Path_LSS_ID
```

#### Example

```
dscli>resumegmir -dev IBM.1750-75FA120 -lss 10
-session 01 IBM.1750-68FA120/00:IBM.1750-68FA150/00
```

**Note:** You might want to change or maintain the values that you had on your B site for the tuning parameters. You must restate these values before you process the **resumegmir** command. You cannot state a value for just one of the tuning parameters. You must restate all of the values (**-cginterval**, **-coordinate**, and **-drain**). The following example shows how to enter the **resumegmir** command to provide these values:

```
dscli>resumegmir -dev IBM.1750-68FA120 -lss 10 -cginterval 5
-coordinate 50 -drain 30 -session 01
IBM.1750-68FA120/00:IBM.1750-68FA150/00
```



---

## Chapter 11. CLI commands

This section describes the command-line interface (CLI) commands that you can use to perform configuration and storage management tasks.

---

### About CLI commands

This is a description of the components and structure of a command-line interface command.

A command-line interface command consists of the following types of components, arranged in the following order:

1. The **command name**.
2. The **command flags** and **flag parameters**.
3. One or more **command parameters**, each followed by any **sub parameters** it might require.

The **command name** specifies the task that the command-line interface is to perform. For example, **lsarraysite** tells the command-line interface to list array sites, and **mklcu** tells the command-line interface to create a logical control unit.

**Flags** modify the command. They provide additional information that directs the command-line interface to perform the command task in a specific way. For example, the **-h** flag tells the command-line interface to display the reference page for the command. Some flags may be used with every command-line interface command. Others are specific to a command and are invalid when used with other commands. Flags are preceded by a hyphen (-), and may be followed immediately by a space and a flag parameter.

**Flag parameters** provide information that is required to implement the command modification that is specified by a flag. For example, the **-user** flag requires a *user\_name* parameter, and the **-passwd** flag requires a *password* parameter. Flag parameters are variables. This means that their value changes to meet your needs. Every user will have a different user name and password. Not all flags require parameters. In this case, the flag itself provides all the information that is necessary. Some flag parameters are optional and might allow the use of multiple values. These values must be separated with a comma and no white space between the values. If you do not provide a parameter, then a default value is assumed. For example, you can specify **-v on**, or **-v off** to turn verbose mode on or off; but if you specify **-v** only, you will get an error.

The **command parameter** provides basic information that is necessary to perform the command task. When a command parameter is required, it is always the last component of the command; and it is not preceded by a flag. Some commands permit multiple command parameters with each parameter separated by a white space and not a comma (unlike flag parameters that allow multiple values). Some commands, like **lsuser**, do not require a command parameter, because a default value of *all* is always assumed. For some commands, like **lsarraysite**, the command parameter is optional. If no value is provided, then a default value of *all* is assumed. If a value is provided, then the command-line interface lists information only about the array site or sites provided in the command parameter string.

In the following example, **lsrank** is the command name. **-dev** and **-l** are command parameters. *IBM.2107-75FA120* is the sub parameter for the **-dev** parameter, and *R1*, *R2*, and *R3* are a list of command parameters.

```
dscli>lsrank -dev IBM.2107-75FA120 -l R1 R2 R3
```

## Understanding the syntax diagrams

A syntax diagram uses symbols to represent the elements of a command and to specify the rules for using these elements.

### Syntax diagrams

#### Main path line



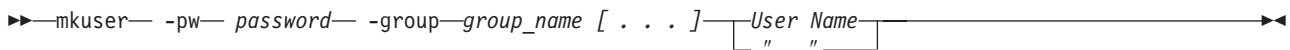
Begins on the left with double arrowheads (>>) and ends on the right with two arrowheads facing each other (><). If a diagram is longer than one line, each line to be continued ends with a single arrowhead (>) and the next line begins with a single arrowhead. Read the diagrams from left-to-right, top-to-bottom, following the main path line.

#### Keyword



Represents the name of a command, flag, parameter, or argument. A keyword is not in italics. Spell a keyword exactly as it is shown in the syntax diagram.

#### Required keywords



Indicate the parameters or arguments you must specify for the command. Required keywords appear on the main path line. Mutually exclusive required keywords are stacked vertically.

#### Optional keywords



Indicate the parameters or arguments you can choose to specify for the command. Optional keywords appear below the main path line. Mutually exclusive optional keywords are stacked vertically.

#### Variable



Represents the value you need to supply for a parameter or argument, such as a file name, user name, or password. Variables are in italics.

## Special characters

### - (minus) or / (slash) sign

Flags are prefixed with a - (minus) sign. Flags define the action of a command or modify the operation of a command. You can use multiple flags, followed by parameters, when you issue a command.

### [ ] square brackets

Optional values are enclosed in square brackets.

### { } braces

Required or expected values are enclosed in braces.

### | vertical bar

A vertical bar indicates that you have a choice between two or more options or arguments.

For example, [ a | b ] indicates that you can choose a, b, or nothing. Similarly, { a | b } indicates that you must choose either a or b.

### ... ellipsis

An ellipsis signifies the values that can be repeated on the command line or multiple values or arguments.

- **dash** A dash indicates that, as an alternative to entering the parameter, a value or values are supplied from stdin. stdin varies depending on your settings and is available when you are using single-shot or script mode. This option is not available when using interactive mode.

---

## List of commands

This is a complete list of the command-line interface commands, alphabetized by command name.

| Command       | Type                                    | Description                                                                                                                                                                                                                                                              |
|---------------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| applykey      | application key and version             | The <b>applykey</b> command applies the licensed machine code (LMC) activation keys for a storage server. You can enter the LMC keys manually, or you can import the keys from an XML file. The file that contains the LMC keys must be downloaded from an IBM Web site. |
| chckdvol      | storage configuration                   | The <b>chckdvol</b> command changes the name of a count key data (CKD) base volume.                                                                                                                                                                                      |
| chextpool     | storage configuration                   | The <b>chextpool</b> command modifies attributes that are associated with an extent pool.                                                                                                                                                                                |
| chfbvol       | storage configuration                   | The <b>chfbvol</b> command changes the name or data type of a fixed block volume.                                                                                                                                                                                        |
| chhostconnect | I/O port and host connect configuration | The <b>chhostconnect</b> command modifies a SCSI host port configuration.                                                                                                                                                                                                |
| chlcu         | storage configuration                   | The <b>chlcu</b> command modifies a logical control unit.                                                                                                                                                                                                                |

| Command      | Type                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| chlss        | storage configuration       | The <b>chlss</b> command modifies a logical subsystem.                                                                                                                                                                                                                                                                                                                                                                                                               |
| chpass       | user account and security   | The <b>chpass</b> command changes the password expiration time and the number of login attempts for a storage complex.                                                                                                                                                                                                                                                                                                                                               |
| chrank       | storage configuration       | The <b>chrank</b> command assigns an unassigned rank to an extent pool, or removes an assigned rank from a extent pool. This command can also be used to change an assigned rank to an unassigned rank.                                                                                                                                                                                                                                                              |
| chsession    | Copy Services               | The <b>chsession</b> command allows you to modify a Global Mirror session.                                                                                                                                                                                                                                                                                                                                                                                           |
| chsi         | storage image configuration | The <b>chsi</b> command modifies a storage image. You can use it to set characteristics such as online or offline state, name, and description.                                                                                                                                                                                                                                                                                                                      |
| chsu         | storage unit configuration  | The <b>chsu</b> command modifies a storage unit.                                                                                                                                                                                                                                                                                                                                                                                                                     |
| chuser       | user account and security   | The <b>chuser</b> command is used to modify and lock or unlock a DS CLI or a DS Storage Manager user account. A CLI user with administrative authority uses this command to update a user account password, modify user group authority, or to lock or unlock a user account. Users that do not have administrator authority, use this command to change an expired password and create a password that is not known to the administrator who created their account. |
| chvolgrp     | storage configuration       | The <b>chvolgrp</b> command modifies a volume group name and volume members.                                                                                                                                                                                                                                                                                                                                                                                         |
| clearvol     | storage configuration       | The <b>clearvol</b> command clears Copy Services relationships for a base logical volume.                                                                                                                                                                                                                                                                                                                                                                            |
| closeproblem | DS6000 close problem        | The <b>closeproblem</b> command modifies the status of a problem in the problem log file to closed.                                                                                                                                                                                                                                                                                                                                                                  |
| commitflash  | Copy Services               | The <b>commitflash</b> command is used as part of the recovery from a disaster scenario to complete a partially formed Global Mirror consistency group.                                                                                                                                                                                                                                                                                                              |

| Command           | Type                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| commitremoteflash | Copy Services               | The <b>commitremoteflash</b> command sends data to a target volume to form a consistency between the remote source and target FlashCopy pair.                                                                                                                                                                                                                                                                                                                                                                                                                      |
| diagsi            | storage image configuration | The <b>diagsi</b> command is an administrative utility command that a user with administrative or service authority can use for nonroutine diagnostic actions.                                                                                                                                                                                                                                                                                                                                                                                                     |
| dscli             | framework                   | The <b>dscli</b> command starts DS CLI. Use this command to run DS CLI commands in the interactive, single-shot, or script mode.                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| exit              | framework                   | Ends an interactive command-line interface session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| failbackpprc      | Copy Services               | The <b>failbackpprc</b> command copies the required data from the source volume to the target volume in order to resume mirroring. This command is used in the disaster recovery processes that are associated with sites using Metro Mirror, Global Mirror, or Metro/Global Mirror processing.                                                                                                                                                                                                                                                                    |
| failoverpprc      | Copy Services               | The <b>failoverpprc</b> command is used only with disaster recovery processing. This command is used in the disaster recovery processes associated with sites using Metro Mirror, Global Mirror, or Metro/Global Mirror processing. The <b>failoverpprc</b> command succeeds even if the paths are down and the volume at the production site is unavailable or nonexistent.                                                                                                                                                                                       |
| freezepprc        | Copy Services               | The <b>freezepprc</b> command creates a new remote mirror and copy consistency group. It places the source logical subsystem (LSS) in the <i>long busy</i> state so that no I/Os can be directed to it. It also removes remote mirror and copy paths between the source LSS and target LSS and sets the <i>queue full</i> condition for the primary volume. This causes the host to queue writes to the primary volume until the <i>queue full</i> condition is reset. During the <i>queue full</i> condition, the primary volume reports <i>long busy</i> status. |

| Command         | Type                          | Description                                                                                                                                                                                                                                                                       |
|-----------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| help            | framework                     | Displays a list of commands available in a command-line interface and optionally displays the syntax or brief description of each command. If you specify this command with no parameters, this command displays only a list of available commands.                               |
| lsaddressgrp    | storage configuration         | The <b>lsaddressgrp</b> command displays a list of address groups for a storage image and the status information for each address group in the list.                                                                                                                              |
| lsarray         | storage configuration         | The <b>lsarray</b> command displays a list of arrays in a storage image and status information for each array in the list.                                                                                                                                                        |
| lsarraysite     | storage configuration         | The <b>lsarraysite</b> command displays a list of array sites and status information for each array site in the list.                                                                                                                                                             |
| lsavailpprcport | Copy Services                 | The <b>lsavailpprcport</b> command displays a list of ESCON or fibre-channel I/O ports that can be defined as remote mirror and copy (formerly PPRC) paths. The DS6000 supports only fibre-channel ports. The Enterprise Storage Server (2105 machine type) supports ESCON ports. |
| lsckdvol        | storage configuration         | The <b>lsckdvol</b> command displays a list of count key data (CKD) base and alias volumes in a storage image and status information for each volume in the list.                                                                                                                 |
| lsddm           | physical resource information | The <b>lsddm</b> command displays a list of disk drive modules (DDMs) and status information for each DDM in the list.                                                                                                                                                            |
| lsxtpool        | storage configuration         | The <b>lsxtpool</b> command displays a list of extent pools in a storage unit and status information on each extent pool in the list.                                                                                                                                             |
| lsfbvol         | storage configuration         | The <b>lsfbvol</b> command displays a list of fixed block volumes in a storage image and status information for each volume in the list.                                                                                                                                          |
| lsflash         | Copy Services                 | The <b>lsflash</b> command displays a list of FlashCopy relationships and status information for each FlashCopy relationship in the list.                                                                                                                                         |



| Command       | Type                                    | Description                                                                                                                                                                                                                                                                                                                                                                          |
|---------------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| lshostconnect | I/O port and host connect configuration | The <b>lshostconnect</b> command displays a list of host connections for a storage image and the status information for each host connection in the list. You can also use this command to obtain a list of worldwide port numbers (WWPNs) from a system-detected-unknown host port. You can use these WWPNs to create a new host connection using the <b>mkhostconnect</b> command. |
| lshosttype    | I/O port and host connect configuration | The <b>lshosttype</b> command displays a list of known hosts, their associated port profiles, address discovery, and logical block size values. Use this command to get the available host types for the <b>mkhostconnect</b> command.                                                                                                                                               |
| lshostvol     | I/O port and host connect configuration | The <b>lshostvol</b> command displays the mapping of host device names or volume names to machine type 2105, 2107, and 1750 volume IDs. (This command is not supported on the i5/OS.)                                                                                                                                                                                                |
| lsioport      | I/O port and host connect configuration | The <b>lsioport</b> command displays a list of I/O ports on a specified storage image and optionally provides performance metrics for each I/O port that is listed.                                                                                                                                                                                                                  |
| lskey         | application key and version             | The <b>lskey</b> command displays the type of licensed machine code (LMC) activation keys that are installed and available for use by the storage unit.                                                                                                                                                                                                                              |
| lslcu         | storage configuration                   | The <b>lslcu</b> command displays a list of logical control units (LCUs) for a storage image and status information for each logical control unit in the list.                                                                                                                                                                                                                       |
| lslss         | storage configuration                   | The <b>lslss</b> command displays a list of logical subsystems (LSSs) for a storage image and status information for each logical subsystem in the list.                                                                                                                                                                                                                             |
| lspe          | DS6000 PE Package                       | The <b>lspe</b> command is used by a DS6000 user to find previously created PE package files that are ready to send to IBM. These files were created with the <b>mkpe</b> command and must be sent to IBM because there was an error during the original FTP of the PE package file.                                                                                                 |

| Command       | Type                                    | Description                                                                                                                                                                                                                                                                                                                                                |
|---------------|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| lsportprof    | I/O port and host connect configuration | The <b>lsportprof</b> command displays a list of port profiles that are supported on a storage unit and their recommended address discovery and logical block size values.                                                                                                                                                                                 |
| lspprc        | Copy Services                           | The <b>lspprc</b> command displays a list of remote mirror and copy (formerly PPRC) volume relationships for a storage image, and status information for each remote mirror and copy volume relationship in the list.                                                                                                                                      |
| lspprcpath    | Copy Services                           | The <b>lspprcpath</b> command displays a list of existing remote mirror and copy path definitions.                                                                                                                                                                                                                                                         |
| lsproblem     | DS6000 problem log                      | The <b>lsproblem</b> command lists problem logs. This command is exclusive to the DS6000.                                                                                                                                                                                                                                                                  |
| lsrank        | storage configuration                   | The <b>lsrank</b> command displays a list of defined ranks in a storage image and status information for each rank.                                                                                                                                                                                                                                        |
| lsremoteflash | Copy Services                           | The <b>lsremoteflash</b> command displays a list of FlashCopy relationships and status information for each FlashCopy relationship in the list.                                                                                                                                                                                                            |
| lsserver      | storage image configuration             | The <b>lsserver</b> command displays all servers in a storage complex or a list of specified servers and it also displays the status information for each server in the list.                                                                                                                                                                              |
| lssession     | Copy Services                           | The <b>lssession</b> command displays a list of Global Mirror sessions for a logical subsystem (LSS) and information regarding the volumes of each session in the list.                                                                                                                                                                                    |
| lssi          | storage image configuration             | The <b>lssi</b> command displays a list of storage images in a storage complex. You can use this command to look at the status of each storage image in the list. The storage image worldwide node name (WWNN) is displayed when this command is used. You must use the storage image WWNN with the <b>lsavailpprcport</b> and <b>mkpprcpath</b> commands. |

| Command           | Type                                    | Description                                                                                                                                                                                                                                                                                                |
|-------------------|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| lsss              | DS6000 PE Package                       | The <b>lsss</b> command is used by a DS6000 user to find previously created offloaded statesave files that are ready to send to IBM. These files were created with the <b>offloadss</b> command and must be sent to IBM because there was an error during the original FTP transfer of the statesave file. |
| lsstgencl         | physical enclosure information          | The <b>lsstgencl</b> command displays a list of storage enclosures and status information for each enclosure in the list.                                                                                                                                                                                  |
| lssu              | storage unit configuration              | The <b>lssu</b> command displays a list of storage units in a storage complex. You can use this command to look at the status and other properties of each storage unit in the list.                                                                                                                       |
| lsuser            | user account and security               | The <b>lsuser</b> command returns a list of storage image user account names and access authority levels.                                                                                                                                                                                                  |
| lsvolgrp          | storage configuration                   | The <b>lsvolgrp</b> command displays a list of volume groups in a storage image and status information for each volume group in the list.                                                                                                                                                                  |
| managehostconnect | I/O port and host connect configuration | The <b>managehostconnect</b> command modifies the volume group assignment for a SCSI host port.                                                                                                                                                                                                            |
| managepwfile      | user account and security               | The <b>managepwfile</b> command creates a password file for an existing ESS or DS user account. This command processes the password requirements for 2105, 2107, and 1750 systems.                                                                                                                         |
| mkaliasvol        | storage configuration                   | The <b>mkaliasvol</b> command creates zSeries CKD alias volumes (generally referred to as parallel access volumes or PAVs) in a storage image.                                                                                                                                                             |
| mkarray           | storage configuration                   | The <b>mkarray</b> command creates one array per command. You can specify multiple array sites if you are working with a DS6000 machine type but only one array site can be specified for a DS8000 machine type.                                                                                           |
| mkckdvol          | storage configuration                   | The <b>mkckdvol</b> command creates zSeries count key data (CKD) base or CKD alias volumes in a storage image.                                                                                                                                                                                             |

| Command         | Type                                    | Description                                                                                                                                                                                                                                                                                                                                                 |
|-----------------|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| mkesconpprcpath | Copy Services                           | The <b>mkesconpprcpath</b> command creates a remote mirror and copy (formerly PPRC) path between source and target logical subsystems over an ESCON connection. The command allows you to specify ESCON direct and ESCON switch connections. Use this command only with IBM System Storage Enterprise Storage Servers (2105, Model 800 and Model 750).      |
| mkextpool       | storage configuration                   | The <b>mkextpool</b> command creates a fixed block or count key data (CKD) storage type extent pool.                                                                                                                                                                                                                                                        |
| mkfbvol         | storage configuration                   | The <b>mkfbvol</b> command creates open systems fixed block (FB) volumes in a storage image.                                                                                                                                                                                                                                                                |
| mkflash         | Copy Services                           | The <b>mkflash</b> command initiates a point-in-time copy from source volumes to target volumes.                                                                                                                                                                                                                                                            |
| mkgmir          | Copy Services                           | The <b>mkgmir</b> command starts Global Mirror for a specified session.                                                                                                                                                                                                                                                                                     |
| mkhostconnect   | I/O port and host connect configuration | The <b>mkhostconnect</b> command configures open systems hosts port attachments to fibre-channel ports that are configured for FC-AL or SCSI-FCP topology. Open systems hosts port attachments to fibre-channel ports are configured for identified access mode and SCSI protocol.                                                                          |
| mklcu           | storage configuration                   | The <b>mklcu</b> command creates a logical control unit (LCU) in a storage image.                                                                                                                                                                                                                                                                           |
| mkpe            | DS6000 PE package                       | The <b>mkpe</b> command creates and copies PE packages from DS6000 nodes to the destination directory on a management node. The <b>mkpe</b> command is also used to create a PE package from the log and configuration files contained on the storage management console, and the package does not contain any files that are copied from the DS6000 nodes. |
| mkpprc          | Copy Services                           | The <b>mkpprc</b> command establishes a remote mirror and copy (formerly PPRC) relationship for a volume pair.                                                                                                                                                                                                                                              |

| Command         | Type                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| mkpprcpath      | Copy Services             | The <b>mkpprcpath</b> command establishes or replaces a remote mirror and copy (formerly PPRC) path between source and target logical subsystems (LSSs) over a fibre-channel connection. This is the only supported connectivity for machine types 2107 and 1750. Paths can be established between the following machine types: 2105:2105, 2107:2107, 2107:1750, 2107:2105, 1750:1750, 1750:2105.                             |
| mkrank          | storage configuration     | The <b>mkrank</b> command creates one fixed block or count key data (CKD) rank from one array.                                                                                                                                                                                                                                                                                                                                |
| mkremoteflash   | Copy Services             | The <b>mkremoteflash</b> command initiates a remote point-in-time copy from source volumes to target volumes through a Remote Mirror and Copy relationship.                                                                                                                                                                                                                                                                   |
| mksession       | Copy Services             | The <b>mksession</b> command opens a Global Mirror session.                                                                                                                                                                                                                                                                                                                                                                   |
| mkuser          | user account and security | The <b>mkuser</b> command creates a DS CLI or a DS Storage Manager user account. A CLI user with administrative authority uses this command to create a user account with a password and user group authority.                                                                                                                                                                                                                |
| mkvolgrp        | storage configuration     | The <b>mkvolgrp</b> command creates a volume group in a storage image.                                                                                                                                                                                                                                                                                                                                                        |
| offloadauditlog | audit commands            | The <b>offloadauditlog</b> command provides an activity report for a console (identified as smc1 or smc2). The report includes basic information, such as, a list of who logged in, when they logged in, and what they did during their session. In addition, a log of service actions (phone connection started, phone connection ended WebSM session started, WebSM session ended) is appended to the end of the audit log. |
| offloadss       | DS6000 PE package         | The <b>offloadss</b> DS6000 command copies state information from nodes to the destination directory on a management node.                                                                                                                                                                                                                                                                                                    |
| pausegmir       | Copy Services             | The <b>pausegmir</b> command pauses Global Mirror for the specified session.                                                                                                                                                                                                                                                                                                                                                  |

| Command           | Type          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pausepprc         | Copy Services | The <b>pausepprc</b> command pauses an existing Remote Mirror and Copy volume pair relationship or pauses a single volume ID. To use this command with a single volume, you must specify either the <b>-at src</b> parameter option or the <b>-at tgt</b> parameter option. If neither of these options are specified in the command, single volumes are not valid.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| quit              | framework     | Ends an interactive command-line interface session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| resumegmir        | Copy Services | The <b>resumegmir</b> command resumes Global Mirror processing for a specified session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| resumepprc        | Copy Services | The <b>resumepprc</b> command resumes a remote mirror and copy (formerly PPRC) relationship for a volume pair.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| resyncflash       | Copy Services | The <b>resyncflash</b> command is a point-in-time copy of an existing FlashCopy pair that was established with the <b>-record</b> and <b>-persist</b> parameters. The <b>resyncflash</b> command only copies the parts of the volume that have changed since the last point-in-time copy. When a pair is established with the <b>-record</b> and <b>-persist</b> parameters, the pair initially synchronizes and a record of all host write operations to the source is maintained in the source volumes. When the <b>resyncflash</b> command is issued on the FlashCopy pair, the new data that is written to the source is copied to the target. The parameters that are specified in this command replace the parameters in the existing relationship. In order to keep the initial <b>-record</b> and <b>-persist</b> parameters, the <b>-record</b> and <b>-persist</b> parameters must be specified in the <b>resyncflash</b> command. |
| resyncremoteflash | Copy Services | The <b>resyncremoteflash</b> command (formerly called the <b>incremoteflash</b> command and associated with the incremental FlashCopy process) increments an existing remote FlashCopy pair that has been established with the <b>-record</b> and <b>-persist</b> parameters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Command           | Type                                    | Description                                                                                                                                                                                                                                                   |
|-------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| reverseflash      | Copy Services                           | The <b>reverseflash</b> command reverses the FlashCopy relationship.                                                                                                                                                                                          |
| revertflash       | Copy Services                           | The <b>revertflash</b> command is used as part of the recovery from a disaster scenario to rollback a Global Mirror consistency group that is in the process of forming. The former Global Mirror consistency group is restored.                              |
| revertremoteflash | Copy Services                           | The <b>revertremoteflash</b> command is used to restore data on the source volume to its most recent consistency formation. All new write operations to the source since the most recent consistency formation are overwritten with the previous consistency. |
| rmarray           | storage configuration                   | The <b>rmarray</b> command deletes arrays.                                                                                                                                                                                                                    |
| rmckdvol          | storage configuration                   | The <b>rmckdvol</b> command deletes count key data (CKD) base or alias volumes from a storage image.                                                                                                                                                          |
| rmextpool         | storage configuration                   | The <b>rmextpool</b> command deletes extent pools from a storage image.                                                                                                                                                                                       |
| rmfbvol           | storage configuration                   | The <b>rmfbvol</b> command deletes fixed block volumes from a storage image.                                                                                                                                                                                  |
| rmflash           | Copy Services                           | The <b>rmflash</b> command removes a relationship between FlashCopy volume pairs.                                                                                                                                                                             |
| rmgmir            | Copy Services                           | The <b>rmgmir</b> command ends Global Mirror processing for the specified session.                                                                                                                                                                            |
| rmhostconnect     | I/O port and host connect configuration | The <b>rmhostconnect</b> command removes a SCSI host port connection from a storage image.                                                                                                                                                                    |
| rmlcu             | storage configuration                   | The <b>rmlcu</b> command deletes existing logical control units.                                                                                                                                                                                              |

| Command       | Type                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| rmpprc        | Copy Services             | The <b>rmpprc</b> command removes a Remote Mirror and Copy volume pair relationship or removes a single volume ID. (You can remove a single volume ID when a disaster occurs, which allows you to specify only the available volume and not both the primary and secondary volumes.) You must specify either the <b>-at src</b> parameter option or the <b>-at tgt</b> parameter option when you process a single volume. If neither of these options are specified in the <b>rmpprc</b> command, a single volume cannot be processed. The <b>-unconditional</b> parameter must also be specified when you process a single volume; otherwise, an error occurs and the command process fails. |
| rmpprcpath    | Copy Services             | The <b>rmpprcpath</b> deletes a Remote Mirror and Copy path.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| rmrank        | storage configuration     | The <b>rmrank</b> command deletes ranks from a storage image.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| rmremoteflash | Copy Services             | The <b>rmremoteflash</b> command removes a relationship between remote FlashCopy volume pairs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| rmsession     | Copy Services             | The <b>rmsession</b> command closes an existing Global Mirror session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| rmuser        | user account and security | The <b>rmuser</b> command removes a storage image user account. CLI users with administrative authority use this command to delete a user account file. Administrators use their passwords in the required field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| rmvolgrp      | storage configuration     | The <b>rmvolgrp</b> command deletes existing volume groups from a storage image.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| sendpe        | DS6000 PE Package         | The <b>sendpe</b> command is used by a DS6000 user with administrator authority to send a previously created PE package to IBM. This might be necessary because there was an error during the original FTP transfer of the package.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| sendss        | DS6000 PE Package         | The <b>sendss</b> command is used by a DS6000 user with administrator authority to send previously created offloaded statesave files to IBM. This might be necessary if there was an error during the original FTP of the statesave file.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |



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| Command            | Type                                    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| setcontactinfo     | DS6000 remote support and notification  | The <b>setcontactinfo</b> DS6000 command provides contact information for your storage system administrator. When you use any of the remote support features, this information is sent to IBM so that an IBM service representative can contact you.                                                                                                                                                                                                                             |
| setdialhome        | DS6000 remote support and notification  | The <b>setdialhome</b> command activates the Call Home feature.                                                                                                                                                                                                                                                                                                                                                                                                                  |
| setflashrevertible | Copy Services                           | The <b>setflashrevertible</b> command modifies a FlashCopy volume pair that is part of a FlashCopy relationship to <i>revertible</i> . The revertible feature allows data to be committed to the target to form a new consistency group or to revert to the last consistency group. This command must be run before the FlashCopy pair can be committed or reverted.                                                                                                             |
| setioport          | I/O port and host connect configuration | The <b>setioport</b> command configures one or more I/O ports for open systems or zSeries host system connections. This command cannot be used for ESCON ports.                                                                                                                                                                                                                                                                                                                  |
| setoutput          | framework                               | The <b>setoutput</b> command sets or displays command output format options. You can use this command to set either default or user-defined output formats. The output format set by this command remains in effect for the duration of the interactive command session unless reset either with a command option or the re-issuance of the <b>setoutput</b> command. Running this command with no parameters displays the current output settings in the default output format. |
| setplex            | DS6000 remote support and notification  | The <b>setplex</b> command allows you to modify the 1750 storage complex settings. You can associate a unique name with the 1750 which allows you to open a secure shell connection to a storage unit for remote support.                                                                                                                                                                                                                                                        |

| Command                  | Type                                   | Description                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| setremoteflashrevertible | Copy Services                          | The <b>setremoteflashrevertible</b> command modifies a remote FlashCopy volume pair that is part of a FlashCopy relationship to <i>revertible</i> . When a pair is revertible, the data can be committed to the target to form a new consistency group, or it can be reverted back to the last consistency group. This command must be run before the FlashCopy pair can be committed or reverted. |
| setsim                   | DS6000 remote support and notification | On zSeries hosts, data storage and data retrieval errors are recorded and can be offloaded. A service information message (SIM) provides the error information. The <b>setsim</b> command activates the SIM notification feature.                                                                                                                                                                  |
| setsmtp                  | DS6000 remote support and notification | The <b>setsmtp</b> DS6000 command modifies the storage image Simple Mail Transport Protocol (SMTP) and activates the e-mail notification settings.                                                                                                                                                                                                                                                 |
| setsnmp                  | DS6000 remote support and notification | The <b>setsnmp</b> command activates the Simple Network Management Protocol (SNMP) trap notification feature, which sends notifications using SNMP when a problem occurs on a storage unit. Use the command to set the SNMP addresses for the notifications.                                                                                                                                       |
| showarray                | storage configuration                  | The <b>showarray</b> command displays detailed properties of a specific array.                                                                                                                                                                                                                                                                                                                     |
| showarraysite            | storage configuration                  | The <b>showarraysite</b> command displays detailed properties of a specific storage image array site.                                                                                                                                                                                                                                                                                              |
| showckdvol               | storage configuration                  | The <b>showckdvol</b> command displays detailed properties of an individual count key data volume. This command can also be used to display the performance metrics for an individual volume ID.                                                                                                                                                                                                   |
| showcontactinfo          | DS6000 remote support and notification | The <b>showcontactinfo</b> command displays customer contact information for the storage image.                                                                                                                                                                                                                                                                                                    |
| showextpool              | storage configuration                  | The <b>showextpool</b> command displays detailed properties or performance metrics of an extent pool.                                                                                                                                                                                                                                                                                              |

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| Command         | Type                                    | Description                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| showfbvol       | storage configuration                   | The <b>showfbvol</b> command displays detailed properties for an individual volume. This command can also be used to display the performance metrics of a fixed block volume.                                                                                                                                                                                                                |
| showgmir        | Copy Services                           | The <b>showgmir</b> command displays properties and performance metrics for a Global Mirror logical subsystem ID. You can issue this command on either the master storage unit or on any of the subordinate storage units. The report that is generated by this command varies significantly depending on which storage unit that you issue the command and the parameters that you specify. |
| showgmircg      | Copy Services                           | The <b>showgmircg</b> command displays consistency group status for the specified Global Mirror session.                                                                                                                                                                                                                                                                                     |
| showgmiroos     | Copy Services                           | The <b>showgmiroos</b> command displays the number of unsynchronized (out of sync) tracks for the specified Global Mirror session.                                                                                                                                                                                                                                                           |
| showhostconnect | I/O port and host connect configuration | The <b>showhostconnect</b> command displays detailed properties of a storage image host connection.                                                                                                                                                                                                                                                                                          |
| showioport      | I/O port and host connect configuration | The <b>showioport</b> command displays properties of an I/O port. It optionally displays the performance metrics for a specific I/O port.                                                                                                                                                                                                                                                    |
| showlcu         | storage configuration                   | The <b>showlcu</b> command displays the detailed properties of an individual logical control unit (LCU).                                                                                                                                                                                                                                                                                     |
| showlss         | storage configuration                   | The <b>showlss</b> command displays detailed properties of a logical subsystem (LSS).                                                                                                                                                                                                                                                                                                        |
| showpass        | user account and security               | The <b>showpass</b> command lists the properties of passwords.                                                                                                                                                                                                                                                                                                                               |
| showplex        | DS6000 remote support and notification  | The <b>showplex</b> DS6000 command displays detailed properties of a 1750 storage complex. Detailed properties include your names, descriptions, and notification settings for the storage complex.                                                                                                                                                                                          |
| showrank        | storage configuration                   | The <b>showrank</b> command displays detailed properties or performance metrics of a rank.                                                                                                                                                                                                                                                                                                   |

| Command       | Type                                   | Description                                                                                                                                                                                                                                                                             |
|---------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| showsi        | storage image configuration            | The <b>showsi</b> command displays detailed properties of a storage image. The storage image worldwide node name (WWNN) is displayed when this command is used. You must use the storage image WWNN with the <b>lsavailpprcport</b> and <b>mkpprcpath</b> commands.                     |
| showsu        | storage unit configuration             | The <b>showsu</b> command displays detailed properties of an individual storage unit.                                                                                                                                                                                                   |
| showuser      | user account and security              | The <b>showuser</b> command displays storage image user account details. A CLI user with administrative authority uses this command to display the properties (group assignment, user account status and number of failed log ins) that is associated with a current user account name. |
| showvolgrp    | storage configuration                  | The <b>showvolgrp</b> command displays detailed properties of a volume group.                                                                                                                                                                                                           |
| testcallhome  | DS6000 remote support and notification | The <b>testcallhome</b> DS6000 command initiates a call home test by creating a test problem record.                                                                                                                                                                                    |
| unfreezeflash | Copy Services                          | The <b>unfreezeflash</b> command resets a FlashCopy consistency group that was previously established with the <b>-freeze</b> parameter when the <b>mkflash</b> or <b>resyncflash</b> commands were issued.                                                                             |
| unfreezepprc  | Copy Services                          | The <b>unfreezepprc</b> command resumes I/O activity on a storage unit where the <b>freezepprc</b> command has been issued. The <b>unfreezepprc</b> command resets the <i>queue full</i> condition for the primary volume. All queued writes to the source volume are written.          |
| ver           | application key and version            | The <b>ver</b> command displays the versions of the command-line interface, Storage Manager, and licensed machine code. The Storage Manager is the HMC code version number and is not a Graphical User Interface (GUI).                                                                 |

## Command flags

You can use these flags with any command-line interface command.

| Flag   | Parameters    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -p     | on   off      | Turns paging on or off. Displays 24 rows at a time unless used with the -r flag. The default is off in single-shot mode and on in interactive mode. You can page up or down by pressing any key. You can specify <i>-p on</i> or <i>-p off</i> to turn the paging on or off; but if you specify only <i>-p</i> , you get an error.<br><b>Note:</b> You can only use this flag with the <i>ls</i> type (for example, <i>lsuser</i> , <i>lskey</i> , <i>lsserver</i> ) commands and the <i>help</i> ( <i>setoutput</i> ) command.                   |
| -r     | <i>number</i> | Specifies the number of rows (1 - 100) per page. This flag is valid only when the -p flag is set to on. The default value is 24 rows.<br><b>Note:</b> You can only use this flag with the <i>ls</i> type (for example, <i>lsuser</i> , <i>lskey</i> , <i>lsserver</i> ) commands and the <i>help</i> ( <i>setoutput</i> ) command.                                                                                                                                                                                                                |
| -fmt   | xml           | Sets the output format to XML.<br><b>Note:</b> You can use this option only with <i>list</i> (for example, <i>lsuser</i> , <i>lskey</i> , <i>lsserver</i> ) commands                                                                                                                                                                                                                                                                                                                                                                              |
|        | stanza        | Sets the output format to stanza.<br><b>Note:</b> You can use this option only with <i>list</i> (for example, <i>lsuser</i> , <i>lskey</i> , <i>lsserver</i> ) commands                                                                                                                                                                                                                                                                                                                                                                           |
|        | delim         | Sets the output format to a table. You must set the column delimiter to a single character with the -delim flag.<br><b>Note:</b> You can use this option only with <i>list</i> (for example, <i>lsuser</i> , <i>lskey</i> , <i>lsserver</i> ) commands                                                                                                                                                                                                                                                                                            |
|        | default       | Sets the output to a space-separated plain text table.<br><b>Note:</b> You can use this option only with <i>list</i> (for example, <i>lsuser</i> , <i>lskey</i> , <i>lsserver</i> ) commands                                                                                                                                                                                                                                                                                                                                                      |
| -delim | <i>char</i>   | Sets the output to delimited output and the delimiter to the single character <i>char</i> . You must enclose <i>char</i> in single or double quotation marks if the character is a shell metacharacter (such as * or \t). If <i>char</i> is not specified, the CLI program returns a syntax error. A blank space, even when it is enclosed within quotation marks, is not a valid character as a delimiter.<br><b>Note:</b> You can use this option only with <i>list</i> (for example, <i>lsuser</i> , <i>lskey</i> , <i>lsserver</i> ) commands |

| Flag    | Parameters | Description                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -hdr    | on   off   | Turns the header on or off. The default is on. You can specify <i>-hdr on</i> or <i>-hdr off</i> to turn the header on or off; but if you specify only <i>-hdr</i> , you get an error.                                                                                                                                                                                                                               |
| -bnr    | on   off   | Turns the banner on or off. The default is on. You can specify <i>-bnr on</i> or <i>-bnr off</i> to turn the banner on or off; but if you specify only <i>-bnr</i> , you get an error.                                                                                                                                                                                                                               |
| -v      | on   off   | Turns verbose mode on or off. The default is off. You can specify <i>-v on</i> or <i>-v off</i> to turn verbose mode on or off; but if you specify only <i>-v</i> , you get an error.                                                                                                                                                                                                                                |
| -fullid | on   off   | Provides fully qualified IDs, which include the storage image ID, for every ID that is displayed in the command output. The default value is off. You can specify <i>-fullid on</i> or <i>-fullid off</i> ; but if you specify only <i>-fullid</i> , you get an error.<br><b>Note:</b> You can only use this command flag with list (for example, lsioport, lskey) and show (for example, showsu, showlss) commands. |

## Command equivalents

Use this list to correlate commands that are supported on the Enterprise Storage Server machine type 2105 to equivalent commands on the DS6000 machine type 1750.

| Enterprise Storage Server machine type 2105 command | DS6000 machine type 1750 command                                          | Description                                                                                                            |
|-----------------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| list server                                         | lsserver                                                                  | Like the 2105, a 2107 storage image contains one pair of servers. A 2107 storage image can contain two storage images. |
| list volumespace                                    | lsxtpool, showxtpool, lsrank, showrank, lsarray, showarray, showarraysite | See Note 1.                                                                                                            |
| create volumespace                                  | mkxtpool, mkarray, mkrank                                                 |                                                                                                                        |
| delete volumespace                                  | rmrank, rmarray, rmxtpool                                                 |                                                                                                                        |

| Enterprise Storage<br>Server machine type<br>2105 command | DS6000 machine type<br>1750 command | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| list diskgroup                                            | lsarraysite,<br>showarraysite       | Like the 2105 disk group, a 2107 array site consists of eight storage devices that are made into a RAID array. A 1750 array site consists of eight storage devices that are made into a RAID array. The 2107 does not support the JBOD array configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| list port                                                 | lsioport, showioport                | <p>Like 2105, the 2107 supports fibre-channel and ESCON ports. The 2107 does not support parallel SCSI ports. The 1750 does not support ESCON ports.</p> <p>The maximum quantity of host device adapter cards and I/O ports is dependent on 2107 model number and on the quantity of installed I/O enclosure features.</p> <p>The 2107 CLI <b>lsioport</b> and <b>showioport</b> commands include the <b>-metrics</b> parameter that returns the performance counter values for the respective I/O port IDs. The <b>-metrics</b> parameter provides the means to monitor I/O port performance statistics.</p> <p>For the 2107, a I/O adapter card is assigned to a storage image.</p> <p>For the 1750, the I/O adapter is integrated with the RAID controller.</p> |
| set port                                                  | setioport                           | See Note 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| list volume                                               | lsfbvol, lsckdvol                   | See Note 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| create volume                                             | mkfbvol, mkckdvol                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| set volume                                                | chfbvol, chckdvol                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| list pav                                                  | lsckdvol, showckdvol                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| create pav                                                | mkckdvol                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| delete pav                                                | rmckdvol                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| list volumeaccess                                         | lsvolgrp, showvolgrp                | See Note 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| create volumeaccess                                       | mkvolgrp, chvolgrp                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| delete volumeaccess                                       | rmvolgrp                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| list hostconnection                                       | lshostconnect,<br>showhostconnect   | <p>The 2105 and 2107 CLI commands are essentially the same, except that the 2107 commands include the volume group ID parameter.</p> <p>For the 2107, the <b>hostconnect</b> commands concern SCSI-FCP host port connections to ESS I/O ports that are configured for SCSI-FCP and identified access mode.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| create hostconnection                                     | mkhostconnect                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| delete hostconnection                                     | rmhostconnect                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| set hostconnection                                        | chhostconnect,<br>managehostconnect |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Enterprise Storage<br>Server machine type<br>2105 command | DS6000 machine type<br>1750 command                             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| list log                                                  | Not applicable.                                                 | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| list featurecode                                          | lsuser, mkuser, rmuser,<br>chuser                               | The 2107 CLI commands can display feature codes when the appropriate parameters are used with the commands.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| list webuseraccount                                       | Not applicable.                                                 | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| create webuseraccount                                     | Not applicable.                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| set webuseraccount                                        | Not applicable.                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| delete webuseraccount                                     | Not applicable.                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| list perfstats                                            | lsioprt, showiopr, showrank, showextpool, showfbvol, showckdvol | The 2105 CLI list perfstats commands concern the Specialist facility that streams performance counter device adapter to the ESS Expert at predefined intervals. This facility does not exist for the 2107. Use the 2107 CLI commands with the <b>-metrics</b> parameter to obtain current performance counter values.                                                                                                                                                                                                                                                        |
| create perfstats                                          | Not applicable.                                                 | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| delete perfstats                                          | Not applicable.                                                 | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| show remotesupport                                        | showplex                                                        | The 2105 Specialist remote communication functions are implemented in the 1750 as attributes of the storage complex object. The following 1750 commands provide methods to view, set, and modify the remote communication attributes: <b>setplex</b> , <b>showplex</b> , <b>setsmtp</b> , <b>setsnmp</b> , <b>setsim</b> , <b>setcontactinfo</b> , and <b>showcontactinfo</b> . The <b>setsmtp</b> command activates the e-mail notification feature, which sends notifications using e-mail when a problem occurs. Use the <b>showplex</b> command to see the smtp setting. |
| set remotesupport                                         | setsmtp, setcontactinfo                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| show email                                                | showcontactinfo                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| create email                                              | setsmtp, setcontactinfo                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| delete email                                              | setsmtp, setcontactinfo                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| set email                                                 | setsmtp, setcontactinfo                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| show pager                                                | Not applicable.                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| create pager                                              | Not applicable.                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| delete pager                                              | Not applicable.                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| set pager                                                 | Not applicable.                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| show snmp                                                 | showplex                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| create snmp                                               | setsnmp                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| set snmp                                                  | setsnmp                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| delete snmp                                               | setsnmp                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| list problem                                              | lsproblem                                                       | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| show problem                                              | lsproblem                                                       | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| delete problem                                            | closeproblem                                                    | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| list task                                                 | Not applicable.                                                 | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| show task                                                 | Not applicable.                                                 | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| list pprcpaths                                            | lsflash, lsremoteflash, lsprrcp, lsavailpprcport, showgmir      | Unlike the 2105, the 2107 CLI Copy Services functions are not task-oriented. The 2107 CLI provides a complete set of FlashCopy and remote mirror and copy (formerly PPRC) make, change, remove, list, and show commands.                                                                                                                                                                                                                                                                                                                                                     |



| Enterprise Storage<br>Server machine type<br>2105 command | DS6000 machine type<br>1750 command | Description                                                                                                                                                                                                                                   |
|-----------------------------------------------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| rsExecuteTask                                             | Copy Services<br>commands           | The 2107 CLI provides a complete set of FlashCopy, remote mirror and copy (formerly PPRC) commands that can be used in the coding of scripts that emulate 2105 Copy Services tasks.                                                           |
| rsList2105s                                               | lshostvol                           | The <b>lshostvol</b> command displays the mapping of host device or volume names to 2107, 2105, and 1750 and volume IDs.                                                                                                                      |
| rsPrimeServer                                             | Not applicable.                     | --                                                                                                                                                                                                                                            |
| rsQuery,<br>rsQueryComplete,<br>rsFlashCopyQuery          | lsflash, lspprc                     | These 2107 Copy Services CLI commands are equivalent to the respective 2105 CLI commands.<br><br>The 2107 <b>mkflash</b> and <b>mkpprc</b> commands provide a -wait flag that delays command response until copy complete status is achieved. |
| rsTestConnection                                          | ver                                 | --                                                                                                                                                                                                                                            |

#### Note 1

Volume space configuration is a primary difference between the 2105 and the 2107. For the 2105, one command configures an array site into a RAID array and rank. For the 2107, one command configures an array site into an array, and a second command configures an array into a rank. For the 2105, a rank is configured as fixed block or CKD, and a CKD rank can contain “interleave” CKD volumes. For the 2107, a rank is assigned to a user-defined extent pool object, which the user defines as either the fixed block or CKD storage type. The “interleave” volume construct does not exist for the 2107. For the 2105, a volume is configured from a specific rank, and cannot span rank boundaries. For the 2107, a volume is configured from an extent pool. An extent pool can contain multiple ranks. A 2107 volume consists of one or more extents that can be allocated from one or more ranks. A fixed block extent is 1 GB (128 logical blocks). Each block contains 512 bytes of usable data space. A CKD extent is 0.94 GB or 1113 CKD cylinders.

For the 2105, a rank is either assigned to server 0 or server 1, dependent on array site location. A 2105 rank is assigned to one of four possible LSS IDs, dependent on device adapter pair location and storage type configuration.

For the 2107, an extent pool is assigned to server 0 or server 1. A rank that is configured from any array site can be assigned to a server 0 or 1 extent pool. Array site position and device adapter pairs are not factors for the rank-to-extent-pool assignment. A volume that is created from a server 0 extent pool is assigned to an even-numbered LSS ID. A volume created from a server 1 extent pool is assigned to odd-numbered LSS ID. A user must define at least two extent pools (0 and 1) but can define as many extent pools as there are ranks. For 2105, a user can delete a rank but cannot delete a volume. For the 2107, a user can delete a single volume, rank, or extent pool. The 2107 CLI showrank and showextpool commands include a -metrics parameter that returns the performance counter values for a specified rank or extent pool ID. The -metrics parameter provides the means to monitor rank and extent pool performance statistics.

| Enterprise Storage<br>Server machine type<br>2105 command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | DS6000 machine type<br>1750 command | Description |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------|
| <p><b>Note 2</b></p> <p>A 2107 ESCON I/O port is used for zSeries host attachment but cannot be configured as a remote mirror and copy path. Each ESCON I/O port must be assigned to only one address group. An address group is a set of 16 LSS IDs that are configured as CKD LCUs; for example, 0x00 to 0x0F. ESCON I/O port access to 2107 CKD volumes is constrained to the address group LCU volumes, up to 4096 volumes.</p> <p>A 2107 fibre-channel port is configured for either SCSI-FCP or FICON protocol. Like 2105, a FICON port is restricted to the point-to-point/switched fabric topology setting. A FICON I/O port is used for zSeries host attachment, but cannot be configured as a remote mirror and copy path. A FICON port must be configured for “anonymous” access mode, meaning that any zSeries host system port (WWNN or WWPN) has unrestricted access to all CKD volumes, up to 64 KB volumes.</p> <p>Like the 2105, a 2107 fibre-channel SCSI-FCP I/O port can be configured for either the point-to-point/switched fabric or FC-AL connection topologies. A port that uses the point-to-point/switched fabric topology can be simultaneously used for OS host system I/O and for remote mirror and copy path configurations. Like 2105, a 2107 fibre-channel SCSI-FCP I/O port allows only “identified” host system ports to access volumes. A host system port WWPN must be identified (registered) to each I/O port through which volume access is intended. For the 2107, this configuration constraint is defined as I/O port “identified” access mode. Host system port WWPN identification is accomplished by the CLI mkhostconnect command.</p> |                                     |             |
| <p><b>Note 3</b></p> <p>A 2107 storage image can contain up to 32 000 volumes, whereas a 2105 unit can contain up to 8 000 volumes. Otherwise, the 2105 and 2107 volume definitions and characteristics are essentially identical.</p> <p>For 2107 CKD PAV volumes, the CLI list and show commands identify both the original base and current base volume assignments. The original and current base concept exists for 2105, but specific relationships are not identified in the output.</p> <p>The 2107 CLI provides a specific set of volume commands for each storage type (fixed block or CKD) as a means to clarify input parameter and output device adapter definitions.</p> <p>The 2107 CLI showfbvol and showckdvol commands include a -metrics parameter that returns the performance counter values for a specified volume ID. The -metrics parameter provides the means to monitor volume performance statistics.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                     |             |

| Enterprise Storage<br>Server machine type<br>2105 command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | DS6000 machine type<br>1750 command | Description |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------|
| <p><b>Note 4</b></p> <p>The 2105 volume access commands concern volume ID assignment to a SCSI-FCP host port initiator or WWPN. For the 2107, volume IDs are assigned to a user-defined volume group ID (mkvolgrp and chvolgrp). A volume group ID is then assigned to one or more host system ports (mkhostconnect and chhostconnect) as a means to complete the volume access configuration.</p> <p>The volume group construct also exists in the 2105 internal code, but the construct is not externalized by the 2105 Specialist or CLI commands.</p> <p>For the 2107, a user must create a FICON/ESCON-all type volume group. This volume group ID is assigned to each ESCON I/O port and to each FICON I/O port. The volume group ID enables FICON access all storage image CKD volumes, up to 64 KB volumes. The volume group ID enables an ESCON I/O port to access to the storage image CKD Address Group volumes, up to 4 KB volumes.</p> <p>For the 2107 fixed block volumes, a volume group must be configured as either "SCSI-mask" or "SCSI-map-256", depending whether the volume group is accessed by a SCSI-FCP host port that uses the report LUNs or poll LUNs access method protocol.</p> |                                     |             |

## Output field descriptions

This list describes the output field names, abbreviations, and field descriptions.

| Output field name | Abbreviation | Description                                                                                                                                                            |
|-------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Access            | access       | Access state.<br><br>The term "access" is used throughout the CLI in different contexts.                                                                               |
| Access state      | accstate     | The accessibility state of an object, online or offline.                                                                                                               |
| Account           | acct         | Customer account name for a storage complex.                                                                                                                           |
| Active copy       | actcpy       | The FlashCopy background copy process is active.                                                                                                                       |
| Addr group        | addrgrp      | A set of 16 contiguous logical subsystems (LSSs) or logical control units (LCUs), starting at ID X0. Address group identifier that is assigned to this ESCON I/O port. |
| Address group     | addrgrp      | A set of 16 contiguous logical subsystems (LSSs) or logical control units (LCUs), starting at ID X0. Address group identifier that is assigned to this ESCON I/O port. |
| Array             | array        | An array of device drive modules (DDMs).                                                                                                                               |
| Array ID          | arrayID      | Array identifier that is assigned to a rank.                                                                                                                           |

| Output field name              | Abbreviation | Description                                                                                                      |
|--------------------------------|--------------|------------------------------------------------------------------------------------------------------------------|
| Array site                     | arsite       | Storage unit identifier followed by an array site identifier. Array site ID does not indicate physical location. |
| Attaching topology             | atchtopo     | Ports to which the host can attach.                                                                              |
| Available storage              | availstor    | Storage that is available for a segment pool, in GB.                                                             |
| Background copy                | bkgrndcopy   | FlashCopy process that copies data from a source volume to a target volume.                                      |
| Base Vol #                     | basevolnum   | Lowest number of logical volumes in the address group.                                                           |
| Bypass cache                   | bypasscach   | Count of bypass cache I/O requests.                                                                              |
| Bytes read                     | byteread     | Count of bytes that are transferred by SCSI read I/O operations, in 128 KB.                                      |
| Bytes written                  | bytewrit     | Count of bytes that are transferred by SCSI write I/O operations, in 128 KB.                                     |
| Cache fast-write hits          | cachfwhits   | Count of cache fast-write write I/O operations where data did not move to or from a storage device.              |
| Cache fast-write read hits     | cachfwrhits  | Count of cache fast-write read I/O operations where data was not moved to or from a storage device.              |
| Cache fast-write read requests | cachfwrreqs  | Count of cache fast-write read I/O operations issued by a host to a volume.                                      |
| Cache fast-write requests      | cachfwreqs   | Count of cache fast-write write I/O operations issued by a host to a volume.                                     |
| Cache space delay              | cachspdelay  | Count of delayed I/O operations from a host to a volume because of insufficient cache space.                     |
| Capacity                       | cap          | Quantity of volume logical blocks or cylinders that are available for access by a host system.                   |
| CG attempts                    | CGattem      | Number of attempts to form a consistency group.                                                                  |
| CG drain                       | CGdrain      | The maximum time that writes are inhibited to the remote site before stopping the current consistency group.     |
| CG interval                    | CGinterval   | The interval time between attempts to form a consistency group.                                                  |
| CG success                     | CGsuccess    | The percentage of successful attempts to form consistency groups.                                                |
| CG time                        | CGtime       | The time when the last successful consistency group was formed.                                                  |

| Output field name            | Abbreviation  | Description                                                                                                                                                                |
|------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CKD irregular track accesses | CKDirtrak     | Count of I/O operations from a host to a CKD volume that has accessed at least one logical track not described by a regular track format descriptor.                       |
| CKD irregular track hits     | CKDirtrkhits  | Count of irregular track I/O operations where data did not move to or from a storage device.                                                                               |
| CKD write promote hits       | CKDwrtprohits | Count of write I/O operations to a volume, where track format descriptor data in cache has promoted at least one track to cache with requiring access to a storage device. |
| Config Vols                  | confgvol      | Number of logical volumes configured on an address group.                                                                                                                  |
| Configuration                | config        | Storage unit internal I/O interface configuration: model and feature code dependent.                                                                                       |
| Configured volumes           | confgvols     | Number of configured volumes.                                                                                                                                              |
| Contaminating writes         | contamwrts    | Count of side file additions to a volume from an update to a concurrent copy protected track or an update to an XRC monitored track.                                       |
| Control ops received         | conopsrcl     | Count of remote mirror and copy SCSI control I/O operations that are received from a SCSI source.                                                                          |
| Control ops sent             | conopssent    | Count of remote mirror and copy SCSI control I/O operations that are sent to a SCSI target.                                                                                |
| Control unit base type       | conbasetype   | Default or user-assigned logical control unit type.                                                                                                                        |
| Copy state                   | cpystate      | Global Mirror copy state.                                                                                                                                                  |
| CopyIndicator                | CopyIndicator | Indicates Yes if the CopyIndicator is set for this FlashCopy relationship.                                                                                                 |
| Created                      | created       | Date of creation.                                                                                                                                                          |
| Crit mode                    | critmode      | Status of critical heavy mode, either enabled or disabled.                                                                                                                 |
| Critical heavy mode          | crithvmode    | Status of critical heavy mode for remote mirror and copy (formerly PPRC) copy operations, either enabled or disabled.                                                      |
| Current base vol             | curbasevol    | Base and alias volume number.                                                                                                                                              |
| Current FICON logins         | curflogs      | Current number of FICON N-port worldwide node name (WWNN) identifiers that are logged in to this I/O port.                                                                 |
| Current SCSI logins          | currentlogs   | Current number of N-ports that are logged in to this I/O port.                                                                                                             |

| Output field name                | Abbreviation  | Description                                                                                                                      |
|----------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------|
| Current time                     | currtime      | Current date, time, local time zone, and Daylight Savings Time.                                                                  |
| DA pair                          | DA pair       | Identifier of the device adapter pair that the DDM is associated with. The DA pair indicates I/O enclosure location.             |
| DASD cache transfers             | DASDtrans     | Count of logical tracks for a volume that were promoted to cache in full or partial track mode (excluding sequential pre-state). |
| Data                             | data          | Status of the array data access: normal, degraded, read only, failed, repairing, or inaccessible.                                |
| Data state                       | datastate     | Status of data access: normal, degraded, read only, failed, repairing, or inaccessible.                                          |
| Date                             | date          | Date and time, including time zones and Daylight Savings Time.                                                                   |
| Date (85)                        | date          | Current clock setting of date.                                                                                                   |
| DDM capacity (GB)                | DDMcap        | Minimum disk capacity of DDMs, in GBs.                                                                                           |
| DDM RPM (revolutions per minute) | DDMRPM        | Minimum rate of disk revolutions per minute of the DDMs in an array.                                                             |
| Description                      | desc          | User-defined description.                                                                                                        |
| Disk capacity (GB)               | dkcap         | Capacity of the DDM, in GBs.                                                                                                     |
| Disk interface                   | dkinf         | Interface type of DDM.                                                                                                           |
| Disk rate (Gb/Sec)               | dkrate        | Interface rate of DDM, in GBs per second.                                                                                        |
| Disk RPM                         | diskrpm       | DDM revolutions per minute.                                                                                                      |
| Disk usage                       | dkuse         | DDM usage in an array site.                                                                                                      |
| Dynamic relocation source        | dyrelocsource | Counting number of extents that were source of a dynamic relocation.                                                             |
| Dynamic relocation target        | dyreloctarget | Counting number of extents that were target of a dynamic relocation.                                                             |
| EC level                         | EClvl         | Engineering change level of the listed enclosure.                                                                                |
| E-mail addresses                 | emailaddr     | One or more e-mail addresses that receive service notification.                                                                  |
| Enclosure #                      | enclnum       | Identifier for an I/O enclosure within a storage unit frame.                                                                     |
| Ending track                     | endtrk        | Ending track address or number.                                                                                                  |
| ESS IO ports                     | ESSIOport     | The set of Enterprise Storage Server I/O ports to which a SCSI host port can log in.                                             |
| ESSNet                           | ESSnet        | Status of storage complex ESSNet user interface, either enabled or disabled.                                                     |

| Output field name                 | Abbreviation   | Description                                                                                                               |
|-----------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------|
| Extended long busy active         | xtndlbzactive  | Default or user-assigned extended long busy setting, enabled or disabled.                                                 |
| Extended long busy timeout (secs) | xtndlbztimeout | Default or user-assigned extended long busy timeout value.                                                                |
| Extent limit                      | extlim         | Maximum number of possible extents.                                                                                       |
| Extent number                     | extentnum      | LSS persistent cache extent number.                                                                                       |
| Extent pool                       | extpool        | Extent pool.                                                                                                              |
| Extent pool ID                    | extpoolID      | Identifier for the extent pool of the assigned rank.                                                                      |
| Extent pool name                  | extpoolnam     | Name of the extent pool of the assigned rank.                                                                             |
| Extent size                       | extsize        | Number of logical tracks in an extent.                                                                                    |
| Extent threshold                  | extthresh      | Extent allocation threshold setting that triggers notification.                                                           |
| Extents                           | exts           | Number of extents in the rank.                                                                                            |
| Extents used                      | extused        | Number of extents used by this volume ID.                                                                                 |
| Fan speed                         | fanspeed       | Current speed of a fan.                                                                                                   |
| Fatal reason                      | fatalrsn       | Reason code for a fatal error.                                                                                            |
| Feature code                      | FC             | Identifier code that is used to order the PC enclosure.                                                                   |
| FICON                             | FICON          | FICON I/O operations that are enabled for this port.                                                                      |
| FICON enabled                     | fenabled       | FICON status, enabled or disabled.                                                                                        |
| Firmware level                    | firmwarelevel  | Identifier for the firmware level that is installed in the hardware management console (HMC) enclosure.                   |
| Frame                             | frame          | Identifier of storage unit frame that contains this I/O enclosure. Frame identifier format is six hexadecimal characters. |
| Frame ID                          | frameID        | Identifier of storage unit frame that contains this I/O enclosure. Frame identifier format is six hexadecimal characters. |
| Frame #                           | frm#           | Frame number of a listed enclosure.                                                                                       |
| Group                             | group          | --                                                                                                                        |
| Host ID                           | hostID         | SCSI host identifier for an Open Systems host that is associated with this host port.                                     |
| ID                                | ID             | Storage image ID in the following format: manufacturer.type.serial number.                                                |

| Output field name     | Abbreviation   | Description                                                                                          |
|-----------------------|----------------|------------------------------------------------------------------------------------------------------|
| I'mACopy              | imacpy         | Indicates Yes if the I'mACopyBit is set for this FlashCopy relationship.                             |
| Inhibit cache loading | inhcachload    | Count of inhibit cache loading I/O requests.                                                         |
| Interface address     | interadd       | FlashCopy arbitrated-loop base address of the storage image enclosure.                               |
| Interface IDs         | interfID       | Identifies four interface IDs that are associated with I/O ports on the HBA.                         |
| Interface rate        | interrate      | Minimum disk interface rate of the disk in an array, in GBs per second.                              |
| Interface type        | interface type | Host attachment interface type (FC-AL, SCSI-FCP, or FICON).                                          |
| Interfaces            | interfs        | Identifier of three interface ports for the HMC enclosure consisting of four hexadecimal characters. |
| Location              | loc            | Location of enclosure. Location format is <i>Utttt.mmm.ppsssss</i> .                                 |
| Logical block         | logblk         | Logical block (512 bytes or 520 bytes).                                                              |
| Logical block size    | logblksz       | Logical block size.                                                                                  |
| Logical vols          | logvols        | Identifier of logical volumes.                                                                       |
| Login limit           | loglim         | Maximum number of N-ports that can log in to this I/O port.                                          |
| LSSs                  | LSSs           | Number of logical subsystems in an address group.                                                    |
| LUN access            | LUNacc         | Quantity of LUNs that are accessible by this host attachment (256 LUNs or 64K LUNs).                 |
| LUN capacity          | LUNcap         | Quantity of LUNs that are accessible by this host attachment (256 LUNs or 64K LUNs).                 |
| Name                  | name           | User-defined name.                                                                                   |
| NVS space allocations | NVSspallo      | Count of I/O operations that cause nonvolatile storage (NVS) space allocation.                       |
| NVS space delay       | NVSspadel      | Count of I/O operations from a host to a volume.                                                     |
| Master count          | mastcount      | Quantity of master LSS IDs on this storage image ID.                                                 |
| Master ID             | mastID         | Master storage image ID.                                                                             |
| Master session ID     | mastsessID     | Global Mirror session ID.                                                                            |
| Master SSID           | mastSSID       | LSS subsystem identifier.                                                                            |
| Memory                | mem            | Amount of processor memory in this PC enclosure, in MB.                                              |
| Migration disk SN     | migradiskSN    | Migration disk serial number.                                                                        |



| Output field name       | Abbreviation  | Description                                                                                              |
|-------------------------|---------------|----------------------------------------------------------------------------------------------------------|
| MRPD interval           | MRPDintvl     | Number of days between dial home to report machine-reported product data (MRPD). This interval can be 0. |
| MTS                     | MTS           | Manufacturer, machine type, and sequence number.                                                         |
| Narrow arrays           | nararrays     | Number of narrow arrays in a rank.                                                                       |
| Normal read hits        | normrdhits    | Number of normal read operations where data did not move to or from a storage device.                    |
| Normal read requests    | normrdrqts    | Number of normal read operations issued by a host to a volume.                                           |
| Normal write hits       | normwritehits | Number of normal write operations where data did not move to or from a storage device.                   |
| Normal write operations | normwriteops  | Number of command sequences with at least one write command.                                             |
| Normal write requests   | normwritereq  | Number of normal write operations issued by a host to a volume.                                          |
| NVS memory              | NVSmem        | Amount of nonvolatile storage (NVS) memory that is assigned to this server, in MB.                       |
| Number of logins        | numlogins     | Current number of valid N-ports that are logged in to this I/O port.                                     |
| Number of logical vols  | numlvols      | Number of logical volumes configured from an extent pool.                                                |
| Number of extents       | numexts       | Number of extents.                                                                                       |
| Number of ranks         | numranks      | Number of ranks configured in an extent pool.                                                            |
| Original base vol       | orgbvols      | Original base volume CKD volume identifier.                                                              |
| OS memory               | OSmem         | Amount of operating system memory that is assigned to the server, in MB.                                 |
| Out-of-sync tracks      | outsynctrks   | The number of tracks that are not synchronized for this FlashCopy relationship.                          |
| Persistent              | persistent    | Status of persistent FlashCopy, either enabled or disabled.                                              |
| Persistent cache (MB)   | pcache        | Amount of persistent cache memory that is assigned to a server, in MB.                                   |
| Physical bytes read     | phbyteread    | Number of physical bytes read.                                                                           |
| Physical bytes written  | phbytewrit    | Number of physical bytes written.                                                                        |
| Physical read           | phread        | Number of physical storage read operations.                                                              |
| Physical write          | phwrite       | Number of physical storage write operations.                                                             |
| Port                    | port          | I/O port.                                                                                                |
| Port group              | portgrp       | Group identifier for host port.                                                                          |

| Output field name                | Abbreviation   | Description                                                                                                                                             |
|----------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Port profile                     | portpro        | Port behavior identification for this SCSI host ID.                                                                                                     |
| Position                         | pos            | Position of DDM in an array configuration of DDMs.                                                                                                      |
| Power mode                       | pw mode        | Current storage unit power control mode.                                                                                                                |
| Power state                      | pw state       | Current storage unit power status.                                                                                                                      |
| PPRC control operations received | PPRCcntroprec  | Remote mirror and copy (formerly PPRC) I/O control operations.                                                                                          |
| PPRC control operations sent     | PPRCcntroplsnt | Remote mirror and copy (formerly PPRC) I/O control operations.                                                                                          |
| PPRC source                      | PPRCsce        | Remote mirror and copy (formerly PPRC) source I/O operations that are enabled for this port.                                                            |
| PPRC target                      | PPRCtgt        | Remote mirror and copy (formerly PPRC) target I/O operations that are enabled for this port.                                                            |
| PPRC tracks                      | PPRCtrks       | Count of logical tracks for a remote mirror and copy (formerly PPRC) primary volume that were transferred to a remote mirror and copy secondary volume. |
| Processor complex                | procplex       | Identifier of processor complex with which the central electronic complex enclosure is associated.                                                      |
| Processor qty                    | procqty        | Number of processors in the PC enclosure.                                                                                                               |
| Processors assigned              | procassd       | Number of processors that are assigned to the server.                                                                                                   |
| Profile                          | profile        | Host port profile.                                                                                                                                      |
| Quick write promotes             | qwriteprots    | Count of logical tracks for a volume that have been destaged from cache to storage devices.                                                             |
| RAID type                        | RAIDtype       | Type and configuration of RAID array.                                                                                                                   |
| Rank                             | rank           | Identifier that the array is assigned to. Rank number consists of storage unit ID and a rank number.                                                    |
| Rank group                       | rnkgrp         | Identifier of rank group where segment pool is configured.                                                                                              |
| Rank position                    | rankpos        | Array position within the assigned rank.                                                                                                                |
| Read operations                  | readops        | Count of I/O command sequences in one read or search command (but no write commands).                                                                   |
| Reads                            | reads          | Count of read I/O operations.                                                                                                                           |
| Real allocated extents           | realallocext   | Count of real allocated extents.                                                                                                                        |
| Real extent conversion           | realextconv    | Count of real extent conversion.                                                                                                                        |

| Output field name               | Abbreviation    | Description                                                                                                                                                  |
|---------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Real extent pool capacity       | relextcap       | Number of gigabytes of real extent pool capacity.                                                                                                            |
| Real extents                    | realext         | Count of real extents.                                                                                                                                       |
| Reason                          | reason          | The reason a condition exists.                                                                                                                               |
| Record cache misses             | reccachemis     | Number of normal record mode read operations where data moved to or from a storage device.                                                                   |
| Record mode reads               | recmoreads      | Number of normal record mode read operations issued by a host to a volume.                                                                                   |
| Recording                       | rec             | FlashCopy - record changed tracks.                                                                                                                           |
| Requested capacity              | reqcap          | Number of volume cylinders that are available for host system access.                                                                                        |
| Requested state                 | reqstate        | Desired state of storage unit: online or offline.                                                                                                            |
| Reserved extents                | resvdexts       | Extents that are reserved in an extent pool.                                                                                                                 |
| Reserved storage (GB)           | resvdstor       | Reserved storage in an extent pool, in GB.                                                                                                                   |
| Revertible                      | revertible      | Revertible to previous Global Mirror state.                                                                                                                  |
| SCSI host port users            | SCSIhostportusr | SCSI host port users of this volume group.                                                                                                                   |
| SCSI TGT                        | SCSItgt         | SCSI target I/O operations that are enabled for this port.                                                                                                   |
| Scheduled on                    | schl-on         | User-defined time that the storage unit powers on.                                                                                                           |
| Scheduled off                   | schl-off        | User-defined time that the storage unit powers off.                                                                                                          |
| Sequential DASD cache transfers | seqDASDtrans    | Count of logical tracks for a volume that were promoted to cache because data was moved by sequential pre-stage and required movement from a storage device. |
| Sequential read hits            | seqreadhits     | Number of sequential read operations where data did not move to or from a storage device.                                                                    |
| Sequential read requests        | seqreadreqs     | Number of sequential read operations issued by a host to a volume.                                                                                           |
| Sequential write hits           | seqwritehits    | Number of sequential write operations that did not require movement of data to or from a storage device before the completion of the operation.              |
| Sequential write operations     | seqwriteops     | Number of command sequences that contain at least one sequential write command.                                                                              |

| Output field name         | Abbreviation | Description                                                                                                           |
|---------------------------|--------------|-----------------------------------------------------------------------------------------------------------------------|
| Sequential write requests | seqwritereq  | Number of sequential write operations issued by a host to a volume.                                                   |
| Serial number             | SN           | Internal identifier for the data space of an array.                                                                   |
| Server                    | server       | Server or DA group to which the DA is assigned.                                                                       |
| SN                        | SN           | Unique serial number.                                                                                                 |
| SNMP addresses            | SNMPaddr     | One or two IP addresses where the storage complex sends SNMP error messages.                                          |
| Source write enabled      | sourcewrite  | Host writes to the source volume are allowed.                                                                         |
| Speed                     | speed        | The current speed of this fan tray.                                                                                   |
| SRC cascade               | SRCcascade   | Source volume is enabled to be in a cascading remote mirror and copy (formerly PPRC) relationship.                    |
| SRC vol LSS               | SRCvolLSS    | Source volume LSS.                                                                                                    |
| SS                        | SS           | Subsystem.                                                                                                            |
| Starting track            | starttrk     | The starting track address for the volume pinned data.                                                                |
| State                     | state        | Storage unit functional status: online, offline, resuming, quiescing, quiesce exception, forced quiescing, or fenced. |
| State (FRU)               | statefru     | Current state of the disk drive module.                                                                               |
| Storage devices           | stordev      | Number of storage devices in an enclosure.                                                                            |
| Storage slots             | storslot     | Number of slots for storage devices in an enclosure.                                                                  |
| Storage type              | stortype     | Extent pool type of the assigned rank.                                                                                |
| Storage unit              | su           | One storage device.                                                                                                   |
| Strip size                | strpsize     | Number of logical tracks in a strip.                                                                                  |
| Stripe size               | strpsize     | Number of logical tracks in a stripe.                                                                                 |
| Subordinate count         | subcount     | Count of subordinate associations.                                                                                    |
| Subordinate ID            | subID        | Subordinate storage unit ID.                                                                                          |
| Subordinate SSID          | subSSID      | Subordinate subsystem identifier.                                                                                     |
| Subsystem                 | subsys       | User-assigned or default subsystem identifier.                                                                        |
| Suspended                 | suspended    | The relationship is suspended.                                                                                        |
| Synced                    | synced       | Date the FlashCopy was synchronized.                                                                                  |
| Target write enabled      | tgtwrite     | Host write I/O operations to a target volume are allowed.                                                             |

| Output field name             | Abbreviation     | Description                                                                                   |
|-------------------------------|------------------|-----------------------------------------------------------------------------------------------|
| Tgt cascade                   | tgtcascade       | Target volume is enabled to be configured in a cascading remote mirror and copy relationship. |
| Tgt read enabled              | tgthead          | Host read I/O operations to a target volume are allowed.                                      |
| Time                          | time             | Current clock setting of time.                                                                |
| Time lower interface activity | timelowifact     | Accumulated time of lower interface I/O activity for the volume.                              |
| Time on-channel               | timeonchan       | Amount of I/O port time for SCSI I/O operations, in seconds.                                  |
| Time physical storage read    | timephread       | Accumulated time for physical storage read operations.                                        |
| Time physical storage write   | timephwrite      | Accumulated time for physical storage write operations.                                       |
| Time read                     | timeread         | Accumulated time for all read operations.                                                     |
| Time write                    | timewrite        | Accumulated time for all write operations.                                                    |
| Time zone                     | timez            | Current clock settings of time zone and Daylight Savings Time.                                |
| Timeout active copy recording | timeoutactcpyrec | --                                                                                            |
| Total storage (GB)            | totlstor         | Amount of storage in an extent pool, in GB.                                                   |
| Topology                      | topo             | Port topology.                                                                                |
| Track size                    | trksize          | Size of the track if the volume is CKD or fixed block.                                        |
| Type                          | type             | Type of storage unit enclosure.                                                               |
| Unknown SCSI IDs              | unkSCSIlog       | List of unknown SCSI N-port WWPN identifiers that attempted login into this I/O port.         |
| Used extents                  | usedexts         | Number of extents that are allocated to volumes in a rank.                                    |
| Virtual extent conversion     | virextconv       | Count of virtual extent conversion.                                                           |
| Virtual extent pool capacity  | virextcap        | Number of gigabytes of virtual extent pool capacity.                                          |
| Virtual extents               | virext           | Count of virtual extents.                                                                     |
| Vol group                     | vol              | Volume group ID. The unique identifier that is assigned to this volume.                       |
| Volume group                  | volgrp           | Volume group.                                                                                 |
| Vols                          | vols             | Number of logical volumes in an address group.                                                |
| Volume type                   | voltype          | Volume type.                                                                                  |
| Wide arrays                   | widearrays       | Number of wide arrays in a rank.                                                              |
| Writes                        | writes           | Count of write I/O operations.                                                                |

| Output field name | Abbreviation | Description                  |
|-------------------|--------------|------------------------------|
| WWNN              | WWNN         | Worldwide node name.         |
| WWPN              | WWPN         | Worldwide port name.         |
| XDC interval      | XDCintvl     | Global Mirror copy interval. |

---

## Messages in the CLI and management console server

When you use the command-line interface and the management console, the applications provide messages regarding the application processes, status, and errors. This section also provides information about how the DS CLI manages OpenVMS messages.

The user interfaces and the supporting software issue three types of messages. When you need to see the details about a DS CLI message, use the **helpmsg** command.

### Informational messages

These messages are identified by the letter "I" at the end of the message identifier. They provide information about system activities as they take place. For instance, an informational message might report that a volume was successfully created. No user action is necessary.

### Warning messages

These messages are identified by the letter "W" at the end of the message identifier. They warn that user activated activities might have consequences that you do not anticipate. Warning messages normally provide the opportunity to continue an activity or to cancel it.

### Error messages

These messages are identified by the letter "E" at the end of the message identifier. They indicate that an error has occurred. Refer to the explanations and recommended actions in this document to resolve the problem.

For the most current list of individual messages ensure that you have the latest IBM System Storage DS6000 Information Center which can be accessed at the following site <http://publib.boulder.ibm.com/infocenter/ds6000ic/index.jsp>.

## OpenVMS messages and exit codes

On OpenVMS host systems, the DS CLI application provides additional system messages in the OpenVMS message format. For example, **%facility-level-identification, text**

Each DS CLI message is also communicated by OpenVMS system services. This ensures that messages appear on the screen and in batch logs according to OpenVMS standards. This allows the OpenVMS command **SET MESSAGE** and customer-written tools which scan for such messages to work correctly. The following mapping between DS CLI and OpenVMS messages applies:

- The facility is IBMDSCLI.
- The level is I (Informational), W (Warning), or E (Error), according to the DS CLI severity level.
- The identification is the DS CLI message identifier.
- The text is a generic text, identifying the DS CLI message.

After displaying the OpenVMS message, the normal DS CLI message is displayed unchanged. This ensures that the DS CLI messages are identical across platforms and that you can reference the DS CLI documentation.

- When you exit the DS CLI, it provides a condition code according to OpenVMS standards instead of the normal DS CLI exit value. The following rules apply:
- A *single-shot* DS CLI command returns the condition code of the DS CLI message for this command. If there are multiple messages, the code with the highest severity is displayed.
  - The DS CLI in *interactive* mode always returns the OpenVMS generic success status: %X00000001.
  - The DS CLI in *script* mode returns either the OpenVMS generic success code or cancels the script while returning the highest severity code of the failed command.

This ensures that the DCL symbol \$STATUS contains a value that can be evaluated by OpenVMS utilities as usual.

## Framework command

This section contains the user interface framework commands for the DS command-line interface.

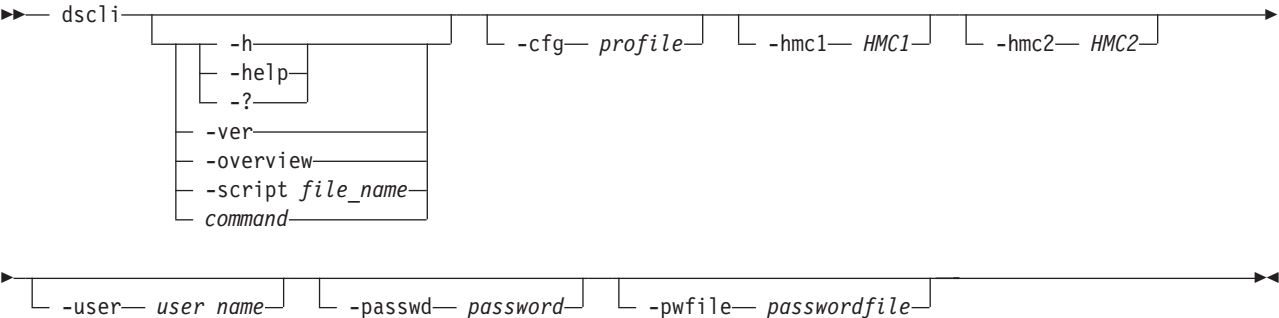
- The framework commands consist of the following commands:
- **dscli**
  - **exit**
  - **help**
  - **quit**
  - **setoutput**

The **dscli** command starts the DS command-line interface (CLI). Use this command to perform storage management tasks from the command-line.

- The **setoutput** command generates the format of the reports for the list and show commands during an interactive command session.

### dscli

The **dscli** command starts DS CLI. Use this command to run DS CLI commands in the interactive, single-shot, or script mode.



## Parameters

**Note:** You must not start more than 100 DS CLI sessions simultaneously. Starting more than 100 DS CLI sessions simultaneously can result in connection problems.

**-help | -h | -?**

(Optional) Displays a help screen about how to use the DS CLI program.

**-ver**

(Optional) Displays the DS CLI version.

**-overview**

(Optional) Provides overview information about the DS CLI.

**-script** *file\_name*

(Optional) Initiates the script mode so that multiple dscli program commands can be issued consecutively using a saved file.

*file\_name*

Specifies the file with the stored program commands to be executed.

Format options that are specified using the framework setoutput command apply to all commands in the file. Output from successful commands routes to stdout, and output from failed commands routes to stderr. If an error occurs during the processing of one of the commands in the file, the script exits at the point of failure and returns to the system prompt.

*command*

Specifies the single command that you want to run.

**-cfg** *profile*

Specifies a profile file. This parameter is not required if you are using default profiles. The default profile file name is dscli.profile, and it is provided as part of the DS CLI package under the profile directory.

**-hmc1** *HMC1*

(Optional) Specifies the primary management console IP address or the host name.

*HMC1*

The IP address for the primary management console.

This parameter is not required if you have established this information as a profile variable.

**-hmc2** *HMC2*

(Optional) Specifies the secondary management console IP address or the host name.

*HMC2*

The IP address for the secondary management console.

This parameter is not required if you have established this information as a profile variable.

**Note:** The *HMC1* and *HMC2* values must apply to two different management consoles.

**-user** *user\_name*

(Optional) Specifies your user name for issuing DS CLI commands on the command-line.



*user\_name*  
Your user name.

This parameter is not required if you have established this information as a profile variable.

**-passwd** *password*  
(Optional and not recommended) Specifies the password that you use for issuing DS CLI commands on the command line.

*password*  
Your password.

This parameter is **not** required or **recommended**. If you use this method to designate your password, the password is displayed on the screen. Another option is to specify a password file (see the next parameter) that is used when you start the DS CLI application.

| Also, if you specify this parameter and do not specify the **-user** parameter,  
| nothing happens. In other words, you are still prompted for a user ID and  
| password before you can log in to the DS CLI application.

**-pwfile** *passwordfile*  
Specifies the password file that contains your password.

*passwordfile*  
Specifies a password file as an alternative to the **-passwd** parameter.

## Example

This command invokes the CLI in interactive mode:

```
>dscli
```

The resulting output

```
dscli>
```

## exit

Ends an interactive command-line interface session.



## Parameters

**-? | -h | -help**

Displays a detailed description of this command, including syntax, parameter descriptions, and examples. If you specify a help option, all other command options are ignored.

## Example

Exit interactive mode

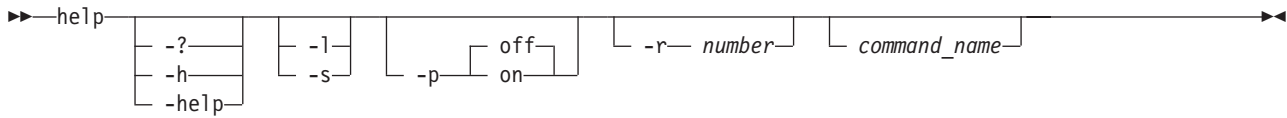
```
dscli>exit
```

Out of interactive mode

#

## help

Displays a list of commands available in a command-line interface and optionally displays the syntax or brief description of each command. If you specify this command with no parameters, this command displays only a list of available commands.



### Parameters

#### -? | -h | -help

Displays a detailed description of this command, including syntax, parameter descriptions, and examples. If you specify a help option, all other command options are ignored.

**-l** Displays a list of available commands with the syntax diagrams for each. If you specify a command name with this parameter, this command displays the syntax for only the specified command.

**-s** Displays a list of available commands with a brief description of each. If you specify a command name with this parameter, this command displays a brief description for only the specified command.

#### -p *off* | *on*

Specifies whether to display one page of text at a time or all text at once.

*off* Displays all text at one time. This is the default value.

*on* Displays one page of text at a time. Pressing any key displays the next page.

#### -r *number*

Specifies the number of rows per page to display when the -p parameter is on. The default is 24 rows. You can specify a value from 1 to 100.

#### *command\_name*

Displays help information for the specified command, including the syntax diagram, parameter descriptions, return codes and errors, descriptions, examples, and miscellaneous remarks.

### Example

#### Invoke help

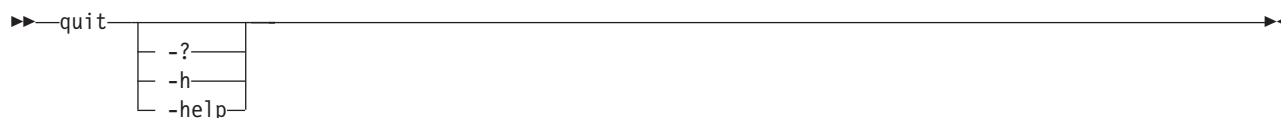
```
#dsccli>help -s exit
```

#### The resulting output

Ends a command-line interface session.

## quit

Ends an interactive command-line interface session.



## Parameters

**-? | -h | -help**

Displays a detailed description of this command, including syntax, parameter descriptions, and examples. If you specify a help option, all other command options are ignored.

## Example

### Quit interactive mode

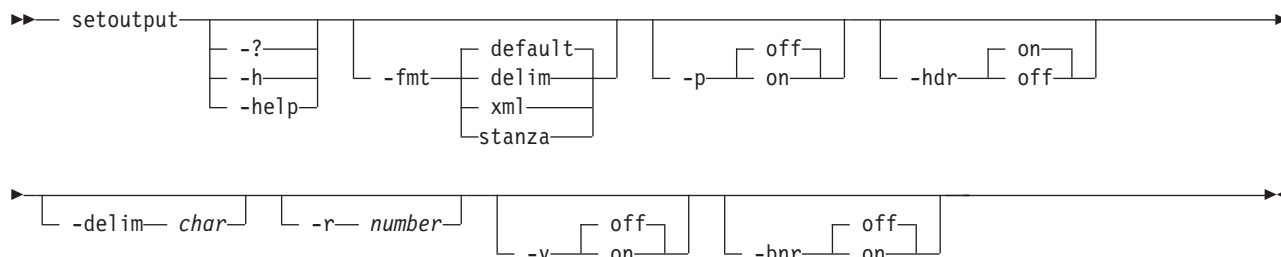
```
dscli>quit
```

### Out of interactive mode

```
#
```

## setoutput

The **setoutput** command sets or displays command output format options. You can use this command to set either default or user-defined output formats. The output format set by this command remains in effect for the duration of the interactive command session unless reset either with a command option or the re-issuance of the **setoutput** command. Running this command with no parameters displays the current output settings in the default output format.



## Parameters

**-? | -h | -help**

Displays a detailed description of this command, including syntax, parameter descriptions, and examples. If you specify a help option, all other command options are ignored.

**-fmt default | delim | xml | stanza**

Specifies the format of the output of a list command. You can specify one of the following values:

### default

Specifies that the output be displayed in a tabular format using spaces as the delimiter between the columns. This is the default value.

### delim

Specifies that the output format be set to a table and sets the column delimiter to a single character specified by the **-delim char** option.

**xml**

Specifies that the output be displayed in XML format.

**stanza**

Specifies that the output be displayed in stanza (horizontal table) format.

**-p off | on**

Specifies whether to display one page of text at a time or all text at once.

**off**

Displays all text at one time. This is the default value.

**on** Displays one page of text at a time. Pressing any key displays the next page.

**-hdr on | off**

Specifies whether to display the table header.

**on** Displays the table header. This is the default value.

**off**

Does not display the table header.

**-delim char**

Specifies the delimiter character (such as a comma) used in the report.

**-r number**

Specifies the number of rows per page to display when the -p parameter is on. The default is 24 rows. You can specify a value from 1 to 100.

**-v off | on**

Specifies whether to enable verbose mode.

**off**

Disables verbose mode. This is the default value.

**on** Enables verbose mode.

**-bnr off | on**

Specifies whether the banner (command header) message be enabled.

**off**

Turns the header mode off so that the command header does not display.

**on** Turns the header mode on so that the command header is displayed.

## Format Examples

### Invoke the **setoutput** command with no options

When you specify the **setoutput** command with no options, the DS CLI always displays the current output settings in the default format (space-separated plain text table), regardless of the values of the output settings. Issue the **setoutput** command as follows:

```
dscli>setoutput
```

### The resulting output

| Paging | Rows  | Format  | Header | Verbose | Banner |
|--------|-------|---------|--------|---------|--------|
| =====  | ===== | =====   | =====  | =====   | =====  |
| Off    | -     | Default | On     | Off     | On     |

## Invoke the **setoutput** command using the **-delim** parameter

The following is an example of the commands that you would issue to get (long) output in comma-separated format for an unassigned rank only. Issue the **setoutput** command to specify the report format and then issue the **lsrank** command to designate the rank being queried.

```
dscli> setoutput -fmt delim -delim ,
dscli> lsrank -dev IBM.1750-75FA120 -state unassigned
```

### The resulting output

**Note:** While this example shows the header turned on, you can choose to turn the header off, in which case you issue the command and include the **-hdr off** parameter.

```
ID,Group,State,datastate,Array,RAIDtype,extpoolID,stgtype
=====
R0,-,Unassigned,Normal,A0,5,-,fb
```

## Invoke the **setoutput** command using the **-fmt xml** parameter

The following is an example of the commands that you would issue to get (long) output in XML format for an unassigned rank only. Issue the **setoutput** command to specify the report format and then issue the **lsrank** command to designate the unassigned rank being queried.

```
dscli> setoutput -fmt xml
dscli> lsrank -dev IBM.1750-68FA120 -state unassigned
```

### The resulting output

```
<IRETURNVALUE>
<INSTANCE CLASSNAME="CliRankHandler"><PROPERTY NAME="rank id">
<DISPLAY TYPE="string">R0</DISPLAY><VALUE TYPE="string">R0</VALUE>
</PROPERTY><PROPERTY NAME="grp"><DISPLAY TYPE="unit8">-</DISPLAY>
<VALUE TYPE="unit16">-</VALUE></PROPERTY><PROPERTY NAME="state">
<DISPLAY TYPE="string">Unassigned</DISPLAY><VALUE TYPE="string">
unassigned</VALUE></PROPERTY><PROPERTY NAME="data">
<DISPLAY TYPE="string">Normal</DISPLAY><VALUE TYPE="string">
Normal</VALUE></PROPERTY><PROPERTY NAME="array_id">
<DISPLAY TYPE="string">A0</DISPLAY><VALUE TYPE="string">A0
</VALUE></PROPERTY><PROPERTY NAME="raidtype"><DISPLAY TYPE="unit8">5</DISPLAY>
<VALUE TYPE="string">5</VALUE></PROPERTY><PROPERTY NAME="extpool_id">
<DISPLAY TYPE="string">-</DISPLAY><VALUE TYPE="string">-</VALUE>
<PROPERTY><PROPERTY NAME="stgtype"><DISPLAY TYPE="string">fb</DISPLAY>
<VALUE TYPE="string">fb</VALUE></PROPERTY>
</INSTANCE></IRETURNVALUE>
```

## Invoke the **setoutput** command using the **-fmt stanza** parameter

When columns are horizontally long, output can be difficult to visually align. Using the stanza format option eliminates this problem. The following is an example of the commands that you would issue to get (long) output in stanza format for an unassigned rank only. Issue the **setoutput** command to specify the report format and then issue the **lsrank** command to designate the unassigned rank being queried.

```
dscli> setoutput -fmt stanza
dscli> lsrank -dev IBM.1750-68FA120 -state unassigned
```

### The resulting output

|           |            |
|-----------|------------|
| ID        | R0         |
| Group     | -          |
| State     | unassigned |
| datastate | normal     |
| Array     | A0         |
| RAIDtype  | 5          |
| extpoolID | -          |
| stgtype   | fb         |

---

## User account and security commands

This section contains commands that are used to maintain command-line interface (CLI) user accounts and security.

The following commands are used to add, modify, delete, and show CLI user accounts and security information:

- **chpass**
- **chuser**
- **lsuser**
- **managepwfile**
- **mkuser**
- **rmuser**
- **showpass**
- **showuser**

The **chpass** command changes the password expiration time and the number of login attempts for a storage complex.

The **chuser** command modifies and locks or unlocks a DS CLI or a DS Storage Manager user account. Users that do not have administrator authority, use this command to change an expired password and create a password that is not known to the administrator who created their account.

The **lsuser** command generates a report that lists the storage image user account names and access authority levels.

The **managepwfile** command creates a password file for an existing ESS or DS user account. This command processes the password requirements for 2105, 2107, and 1750 systems.

The **mkuser** command creates a DS CLI or a DS Storage Manager user account.

The **rmuser** command removes a storage image user account. CLI users with administrative authority use this command to delete a user account file.

The **showpass** command generates a report that lists the number of days until the password expires and the number of failed logins that are associated with the password.

The **showuser** command generates a report that displays the details for an individual storage image user account.

### chpass

The **chpass** command changes the password expiration time and the number of login attempts for a storage complex.

```

>> chpass [-expire number] [-fail number]

```

## Parameters

### **-expire** *number*

(Optional) Specifies the number of days a Storage Manager user account password is valid before it expires. The default number of days is 365. If you do not want the password to expire, enter a value of zero. After the password expires, the user is not allowed to log in unless the password is changed.

### **-fail** *number*

(Optional) Specifies the number of login attempts allowed on any given Storage Manager user account. The number of login attempts can be zero to twenty-five. The default number of login attempts is 15. If you do not want a limit on the number of login attempts, enter zero. After the number of login attempts is exceeded, the user account is locked.

## Example

### Invoking the chpass command

```
dscli>chpass -expire 20 -fail 0
```

### The resulting output

```

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI
Version 5.0.0.0 DS:IBM
Password parameters successfully changed.

```

## chuser

The **chuser** command is used to modify and lock or unlock a DS CLI or a DS Storage Manager user account. A CLI user with administrative authority uses this command to update a user account password, modify user group authority, or to lock or unlock a user account. Users that do not have administrator authority, use this command to change an expired password and create a password that is not known to the administrator who created their account.

```

>> chuser [-pw new_password] [-lock] [-unlock] [-group group_name [. . .]]
[User_Name]

```

## Parameters

**Note:** When a person with administrator authority designates the password, the password is set as expired upon its initial use. The user of the password is required to establish a new password using the **chuser** command before access to the rest of the DS CLI application is granted.

### **-pw** *new\_password*

(Optional) Specifies that a new password be assigned to the user.

### Notes:

1. When a person with administrator authority is using this parameter in association with the `-unlock` parameter, the new password is temporary and expires upon the initial use.
2. When a person without administrator authority uses this parameter, the new password becomes their valid password and replaces their prior password.

*new\_password*

The new password.

The new password and its usage must meet the following criteria:

- Be six to 16 characters long.
- Must contain five or more letters, and it must begin and end with a letter.
- Must contain one or more numbers.
- Cannot contain the user's user ID.
- Is case-sensitive.

### **-lock**

(Optional) Locks a user account.

Persons with administrator authority can use this parameter to lock a user account. The affect of this locking action is not enacted until the user authenticates their account. In other words, if a user is already active (authenticated) and using the DS CLI application, the lock does not take place until they log out of the application.

### **-unlock**

(Optional) Unlocks a user account.

A person with administrator authority can use this parameter to unlock a user account when the user can no longer log into the DS CLI application. The reasons a user might not be able to log into the DS CLI application can include:

- The user forgot their password and in an attempt to log in they went beyond the set number of allowable attempts. Going beyond the set limit locks the user account.

**Note:** When unlocking a user account for this scenario, the administrator must also assign a new password to the user using the **-pw** parameter. The new password is temporary and immediately expires after its initial use. The administrator must notify the user of this new password.

- Someone with administrator authority has locked the user account.

### **-group** *group\_name* [...]

(Optional) The user's access authority group.

*group\_name* [...]

The following list provides the list choices that can be assigned to a user. Multiple names must be separated by commas. For example, `op_copy_services,service`.

#### **admin**

The administrator user group has access to all management console server service methods and all storage image resources.

#### **op\_storage**

The storage operator user group has access to physical



configuration service methods and resources, including storage complex, storage image, array, rank, and extent pool objects. This user group inherits all the authority of the `op_copy_services` and `monitor` user groups, excluding security methods.

#### **op\_volume**

The volume operator user group has access to service methods and resources that relate to logical volumes, hosts, host ports, logical subsystems, logical volumes, and volume groups, excluding security methods. In addition, this user group inherits all authority of the `monitor` user group.

#### **op\_copy\_services**

The copy services operator user group has access to all Copy Services service methods and resources, excluding security methods. In addition, this user group inherits all authority of the `monitor` user group.

#### **service**

The service user group includes `monitor` authority, plus access to all management console server service methods and resources, such as performing code loads and retrieving problem logs.

#### **monitor**

The `monitor` user group has access to `list` and `show` commands. It provides access to all read-only, nonsecurity management console server service methods and resources.

#### **no\_access**

The `no_access` user group does not have access to any service methods or storage image resources. By default, this user group is assigned to any user account in the security repository that is not associated with any other user group.

*User\_Name* | –  
(Required) The user account name.

#### **Notes:**

1. The administrator inserts the name of the user account that is affected by the changes (group name, lock, or unlocking).
2. Users who are changing their passwords insert their user account name.

If you use the dash (-), the specified value is read from standard input.

### **Example (1750)**

#### **Invoking the `chuser` command**

```
dscli>chuser -pw xy0abcde testuser
```

#### **The resulting output**

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

```
User Name testuser successfully modified.
```

## **lsuser**

The **lsuser** command returns a list of storage image user account names and access authority levels.

## Parameters

There are no parameters for this command.

## Example

**Note:** For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

## Invoking the lsuser command

```
dscli>lsuser
```

## The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI

| Name      | Group                     | State  |
|-----------|---------------------------|--------|
| Testuser  | services,op_copy_services | active |
| Biguser   | admin                     | active |
| Smalluser | op_storage                | locked |

## Report field definitions

**Name** Specifies the user name that is assigned to the user account.

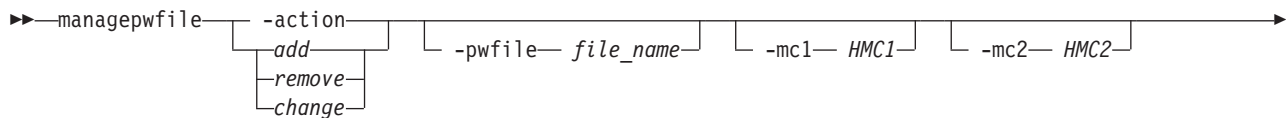
**Group** Specifies the access authority group of the user. One or more of the following group designations is displayed:

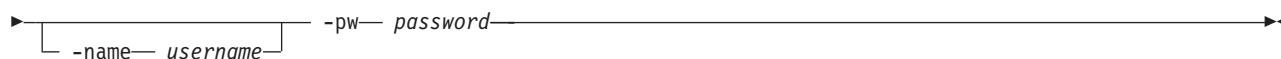
- admin
- op\_storage
- op\_volume
- op\_copy\_services
- service
- monitor
- no\_access

**State** Specifies the status of the user account for the designated user group, either active or locked.

## managepwfile

The **managepwfile** command creates a password file for an existing ESS or DS user account. This command processes the password requirements for 2105, 2107, and 1750 systems.





## Parameters

### **-action**

(Required) Specifies that a process that is designated by the subparameter be enacted on the password file.

*add* Specifies that the password file be created by adding the first line of the file, which contains the primary HMC designation and the HMC user name.

*remove* Specifies that the password file be removed for the designated user.

*change* Specifies that the password file be changed for the designated user.

### **-pwfile** *file\_name*

(Optional) Specifies the name that you want to use for the password file. You can specify the password file as an absolute path or a relative path. The relative path is obtained from the current working directory.

*file\_name*  
The user-specified ESS or DS password file name.

### **-mc1**

(Optional) Specifies the DNS name or the IP address.

**Note:** You can use the default value that is specified for HMC1 in your profile file, or you can use the value that is specified for the current CLI session connection.

*HMC1*  
Designates the primary HMC or 2105 DNS name or IP address. This information along with the **-name** parameter is used as a key in the password file.

### **-mc2**

(Optional) Specifies the DNS name or the IP address of the secondary HMC.

**Note:** You can use the default value that is specified for HMC2 in your profile file, or you can use the value that is specified for the current CLI session connection.

*HMC2*  
Designates the secondary HMC or 2105 DNS name or IP address.

### **-name**

(Optional) Specifies the name that you use to access the DS CLI application.

*username*  
Designates the user-specified SMC or 2105 user name. This information along with the **-mc1** parameter information is used as a key in the password file.

### **-pw** *password*

(Required) Specifies a user-assigned password.

### *password*

Specifies the password that enables user name access to this ESS or DS CLI client installation. The password is case-sensitive.

#### **Notes:**

1. A password file is created with a user's default protection mask. The user needs to update the protection mask to allow access only to the owner of the file. Also, you must write down the directory name where the password file is contained in case you need to use it later.

2. The password file has a default value of `<user_home>/dscli/security.dat`. The home directory `<user_home>` is defined by the Java system property named "user.home". The location of your password file is determined by your operating system. The following examples are home directories in different operating systems:

#### **Windows operating system**

For a Windows operating system, the property value defaults to the environment variable `%USERPROFILE%`. As a result, your personal profile is `C:\Documents and Settings\<username>\dscli\security.dat`.

#### **UNIX or Linux operating system**

For an UNIX or Linux operating system, the property value defaults to the environment variable `$HOME`. As a result, your personal profile is `~/dscli/security.dat`.

#### **i5/OS**

For the i5/OS, your personal profile is `/home/<username>/dscli/security.dat`.

#### **OpenVMS system**

For an OpenVMS operating system, the property value defaults to the logical name `SY$LOGIN`. As a result, your personal profile is `[/dscli.profile]security.dat`.

**Note:** The values of the Java system properties can be redefined by JRE options. If you are having problems, check to see if you have an environment setting like the following on your local system:

```
_JAVA_OPTIONS=-Duser.home=...
```

## **Example (1750)**

### **Invoking the managepwfile command**

```
dscli>managepwfile -action add -mcl myess.ibm.com -name testuser -pw AB9cdefg
```

### **The resulting output**

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI
Version 5.0.0.0 DS: IBM.1750-68FA120
Record myess.ibm.com/testuser successfully added to password file
c:\Documents and Settings\testuser\dscli\security.dat
```

## **mkuser**

The **mkuser** command creates a DS CLI or a DS Storage Manager user account. A CLI user with administrative authority uses this command to create a user account with a password and user group authority.

```

▶▶—mkuser— -pw— password— -group—group_name [. . .]—User_Name————▶▶
 [" - "]

```

## Parameters

**pw** *password*

(Required) Specifies the password that is assigned to the user that allows them to access the use of the DS CLI command line function. This password is temporary and set to expire after the initial use. The user must assign themselves a new password using the **chuser** command before they can use any other commands in the DS CLI application.

*password*

The password assigned by the administrator to user.

The password and its usage must meet the following criteria:

- Be six to 16 characters long.
- Must contain five or more letters, and it must begin and end with a letter.
- Must contain one or more numbers.
- Cannot contain the user's user ID.
- Is case-sensitive.

**-group** *group\_name* [...]

(Required) The user's access authority group.

*group\_name* [...]

The following list provides the list choices that can be assigned to a user. Multiple names must be separated by commas. For example, `op_copy_services,service`.

### **admin**

The administrator user group has access to all management console server service methods and all storage image resources.

### **op\_storage**

The storage operator user group has access to physical configuration service methods and resources, including storage complex, storage image, array, rank, and extent pool objects. This user group inherits all the authority of the `op_copy_services` and monitor user groups, excluding security methods.

### **op\_volume**

The volume operator user group has access to service methods and resources that relate to logical volumes, hosts, host ports, logical subsystems, logical volumes, and volume groups, excluding security methods. In addition, this user group inherits all authority of the monitor user group.

### **op\_copy\_services**

The copy services operator user group has access to all Copy Services service methods and resources, excluding security methods. In addition, this user group inherits all authority of the monitor user group.

### **service**

The service user group includes monitor authority, plus access to all management console server service methods and resources, such as performing code loads and retrieving problem logs.

### **monitor**

The monitor user group has access to list and show commands. It provides access to all read-only, nonsecurity management console server service methods and resources.

### **no\_access**

The no\_access user group does not have access to any service methods or storage image resources. By default, this user group is assigned to any user account in the security repository that is not associated with any other user group.

*User\_Name* | –

(Required) The current user account user name.

If you use the dash (-), the specified value is read from standard input.

## **Example (1750)**

### **Invoking the mkuser command**

```
dscli>mkuser -pw AB9cdefg -group service,op_copy_services testuser
```

### **The resulting output**

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI
Version 5.0.0.0 DS: IBM.1750-68FA120
User Name testuser successfully created.
```

## **rmuser**

The **rmuser** command removes a storage image user account. CLI users with administrative authority use this command to delete a user account file. Administrators use their passwords in the required field.

```
►►rmuser [-quiet] [User_Name]
```

## **Parameters**

### **-quiet**

(Optional) Turns off the confirmation prompt.

*User\_Name* | –

(Required) The current user account user name.

If you use the dash (-), the specified value is read from standard input.

## **Example (1750)**

### **Invoking the rmuser command**

```
dscli>rmuser testuser
```

### **The resulting output**

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version 5.0.0.0 DS: IBM.1750-68FA120
Are you sure you want to delete User Name testuser? y/n
Y
User Name testuser successfully deleted.
```

## showpass

The **showpass** command lists the properties of passwords.

►► showpass ◀◀

### Parameters

There are no parameters for this command.

### Example (1750)

#### Invoking the showpass command

```
dscli>showpass
```

#### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI
Version 5.0.0.0 DS: IBM.1750-68FA120
Password Expiration (days) 33 days
Failed Logins Allowed 5
```

## showuser

The **showuser** command displays storage image user account details. A CLI user with administrative authority uses this command to display the properties (group assignment, user account status and number of failed log ins) that is associated with a current user account name.

►► showuser ◀◀

*User\_Name*  
" " "

### Parameters

*User\_Name* | -

(Required) Specifies the user account name.

If you use the dash (-), the specified value is read from standard input.

### Example

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following table represents the headers that are displayed on the output reports that are associated with the **showuser** command. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750. .

#### Invoking the showuser command

```
dscli>showuser testuser
```

#### The resulting output

| Column Header | Description                             |
|---------------|-----------------------------------------|
| Name          | Name of the user that you have queried. |

| Column Header | Description                                                                                                                                                                                                                                                                                  |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Group         | The user's access authority group. One or more of the following group designations is displayed: <ul style="list-style-type: none"> <li>• admin</li> <li>• op_storage</li> <li>• op_volume</li> <li>• op_copy_services</li> <li>• service</li> <li>• monitor</li> <li>• no_access</li> </ul> |
| State         | The status of the user account for the specified user group, either active or locked.                                                                                                                                                                                                        |
| FailedLogins  | Count of login failures since last successful login for this user. This number resets to 0 with each successful login.                                                                                                                                                                       |

## Application key and version commands

This section contains commands that are used to maintain application keys and to view the current CLI version.

Use the following commands to add and list application keys and to show the current command-line interface version:

- **applykey**
- **lskey**
- **ver**

The **applykey** command activates the licenses for your storage unit.

The **lskey** command generates a report that displays the type of licensed machine code activation keys that are installed and are available for use by the specified storage unit.

The **ver** command displays the versions of the command-line interface, Storage Manager, or licensed machine code either individually or collectively depending on how you enter the command.

### applykey

The **applykey** command applies the licensed machine code (LMC) activation keys for a storage server. You can enter the LMC keys manually, or you can import the keys from an XML file. The file that contains the LMC keys must be downloaded from an IBM Web site.

```

>> applykey [-key key [...]] [-file file_name] [" - " storage_image_ID]

```



## Parameters

**-key** *key [...]*

(Optional) Specifies the LMC key. To specify multiple keys, enter a comma between each key. Do not include a blank space between each key.

This parameter is required if the **-file** parameter is not specified.

**-file** *file\_name*

(Optional) Specifies the file name of the LMC activation key file.

This parameter is required if the **-key** parameter is not specified.

*storage\_image\_ID* | -

(Required) Specifies the storage image ID where the LMC activation key file is imported. The ID includes manufacturer, machine type, and serial number.

If you use the dash (-), the specified value is read from standard input.

## Example (1750)

### Invoking the **applykey** command

```
dscli>applykey -file keys.xml IBM.1750-68FA120
```

## lskey

The **lskey** command displays the type of licensed machine code (LMC) activation keys that are installed and available for use by the storage unit.

```
▶▶— lskey— [storage_image_ID]—————▶▶
 " _ "
```

## Parameters

*storage\_image\_ID* | -

(Required) Specifies the storage image ID for which to view a list of activated features. The ID includes manufacturer, type, and serial number.

If you use the dash (-), the specified value is read from standard input.

However, you cannot use the dash (-) if you are using the DS CLI interactive command mode.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following table represents the headers that are displayed on the output report that is associated with the **lskey** command. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750. The only difference is the value input for the *storage\_image\_ID* parameter.

### Invoking the **lskey** command

```
dscli>lskey IBM.2107-75FA120
```

### The resulting output

```
Sun Apr 09 02:23:49 PST 2004 IBM DS CLI
```

| Activation Key                | Authorization Level (TB) | Scope |
|-------------------------------|--------------------------|-------|
| Operating Environment (OEL)   | 45                       | All   |
| Remote mirror and copy (RMC)  | 25                       | All   |
| Remote mirror for z/OS (RMZ)  | 25.1                     | CKD   |
| Point in time copy (PTC)      | On                       | All   |
| Parallel access volumes (PAV) | On                       | CKD   |

## Report field definitions

### Activation key

Specifies the type of LMC activation key that is activated for the storage image. One of the following values is displayed:

- Operating Environment
- Point-in-time copy
- Remote Mirror and Copy
- Parallel access volumes
- Remote Mirror for z/OS

### Authorization Level (TB)

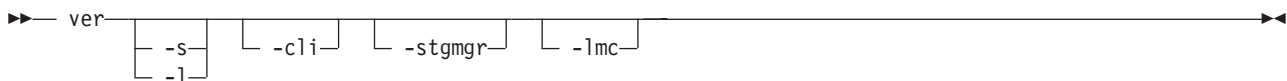
Specifies the capacity of the specified license feature. The quantity is displayed in terabytes (TB). One of the following values is displayed:

- Value in terabytes
- **On** if the license is for the maximum capacity or **Off** if the license is for zero capacity

**Scope** Specifies the storage type for the designated license: fixed block (FB), count key data (CKD), or All. Parallel access volumes and Remote Mirror for z/OS display only the values CKD or All.

## ver

The **ver** command displays the versions of the command-line interface, Storage Manager, and licensed machine code. The Storage Manager is the HMC code version number and is not a Graphical User Interface (GUI).



## Parameters

- s** (Optional) The **-s** parameter displays the version of the command line interface program. You cannot use the **-s** and **-l** parameters together.
- l** (Optional) The **-l** parameter displays the versions of the command line interface, Storage Manager, and licensed machine code. You cannot use the **-l** and **-s** parameters together.

(Optional) Displays the version of the command line interface program.  
Version numbers are in the format version.release.modification.fixlevel.

(Optional) Displays the version of the Storage Manager.

(Optional) Displays the version of the licensed machine code.

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS Storage Manager: 5.0.1.0
LMC: 5.0.1.0
```

image IDs. A storage image ID consists of manufacturer, machine type, and serial number. You must separate multiple IDs with a space between each ID.

**Note:** You cannot specify an ID range.

If you use the dash (-), the specified value is read from standard input.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **lsstgenc1** command using the **-l** parameter. There are some differences in the returned values for a 2107 versus a 1750.

### Invoking the lsstgenc1 command

```
dscli>lsstgenc1 -l IBM.1750-68FA120
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI  
Version: 5.0.0.0 DS: IBM.1750-68FA120

| ID                       | Frame    | Enclnum | Loc                | FC                 | Interfaces                                                               |
|--------------------------|----------|---------|--------------------|--------------------|--------------------------------------------------------------------------|
| IBM.1750-EX1.68FA120/S00 | - (null) | S01     | U1750.511.685FA120 | - (Not applicable) | 0080, 0081, 0180, 0181 (Not interface values. See the field definitions) |
| IBM.1750-EX1.68FA120/S01 | - (null) | S02     | U1750.511.685FA120 | - (Not applicable) | 0082, 0083, 0182, 0183 (Not interface values. See the field definitions) |

| Interadd | Storslot | Stordev | Cap | RPM   | State  |
|----------|----------|---------|-----|-------|--------|
| 0 x 0    | 16       | 16      | 145 | 10000 | normal |
| 0 x 1    | 16       | 16      | 145 | 10000 | normal |

## Report field definitions

**ID** Specifies the enclosure ID and enclosure number.

**Note:** This is the only information that is displayed if you use the **-s** parameter. None of the other values are displayed.

**Frame** Specifies null (-) for the 1750.

### Enclnum

(1750) Identifies a storage enclosure within a storage unit frame. The values displayed for the enclosure are S00 - S03 or S10 - S13. These values are interpreted as follows:

- Enclosures S0x are located on DA pair interface 0.
- Enclosures S1x are located on DA pair interface 1.

**Notes:**

1. *y* represents the position of the storage enclosure. For example, the distance from the server enclosure. (0 – first, 1 – second, 2 – third, 3 – fourth)
2. The server enclosure contains a storage enclosure element that resides on FC-AL Loop 0, and that is what is returned with the command output.

**Loc** Specifies the storage enclosure location by identifying the storage unit frame that contains the storage enclosure. The location format is *Utttt.mmm.ppssss*.

**FC** Specifies the feature code that was used to order this storage enclosure.

**Interfaces**

Specifies a list of four interface identifiers, one for each DA I/O port.

A DA interface ID consists of four hexadecimal characters with the following format: *t00 eeeee aaaa pppp b*, (value is separated for readability), where

- *t* = port type (0 = I/O port, DA ports are always I/O ports)
- *00* = reserved
- *eeeee* = enclosure number
- *aaaa* = adapter number
- *pppp* = port number
- *b* = indicates that the value is a binary string

The values for DS6000 represent the following:

**Notes:**

1. For dual loop 0 enclosures, the DA I/O port values are displayed as 0080, 0081, 0180, 0181.
2. For dual loop 1 enclosures the DA I/O port values are displayed as 0082, 0083, 0182, 0183.

**Interadd**

Specifies the FC-AL interface base address assigned to this storage enclosure for DDM access.

**Storslot**

Specifies the number of slots for storage devices in this storage enclosure.

**Stordev**

Specifies the number of storage devices that are installed in this storage enclosure.

**Cap**

Specifies the capacity of DDMs in the storage enclosure.

**Note:** This field can contain multiple capacity values separated by a comma when the DDMs with different capacity are installed in the storage enclosure.

**RPM**

Specifies the rpm of the DDMs in the storage enclosure.

**Note:** This field can contain multiple RPM values separated by a comma when the DDMs with different capacity are installed in the storage enclosure.

**State** Specifies the condition of the storage enclosure. The condition of the enclosure is either *normal* or one of the conditions that falls under the category *not normal*. The following values can be displayed:

- normal**  
Indicates that the storage enclosure is not in any failure or transient condition.
- failed** Indicates that the storage enclosure is broken and ready to be removed without impacting the system. This condition changes to *inter failed* if the storage enclosure is found to be in good condition again.
- new** This condition only displays when a storage enclosure is first discovered.
- removed**  
Indicates that the storage enclosure was removed from the system.
- inappropriate**  
Indicates that the hardware resource cannot be integrated in the system.
- inter failed**  
Indicates that the hardware resource is faulty but still working.
- PFSed (Prepared for Service)**  
Indicates that the storage enclosure is ready to be removed without impacting the system.
- attention**  
Indicates that there is a problem with the storage enclosure; however, it is not known whether it is faulty or not. This condition reverts to normal if the problem is closed.

## Physical resource information commands

This section contains commands that are used to view information about the physical resources in your storage complex.

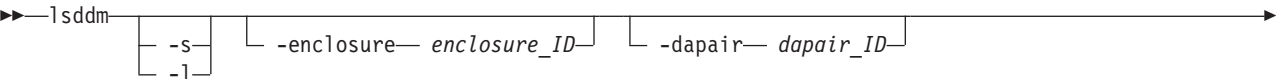
Use the following commands to view information about the physical resources in your storage complex:

- **lsddm**

The **lsddm** command displays a report that lists the disk drive modules and status information for each disk drive module in the list.

### lsddm

The **lsddm** command displays a list of disk drive modules (DDMs) and status information for each DDM in the list.





## 1

- 1

1

1

**Note:** You cannot use the dash (-) while you are in the DS CLI interactive command mode.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **lsddm** command using the **-l** parameter.

### Invoking the lsddm command

```
dscli>lsddm -l IBM.2107-75FA120
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

| ID                                | Model   | loc               | Firmware level | DA pair | Dualloop | dkcap (10^9B) |
|-----------------------------------|---------|-------------------|----------------|---------|----------|---------------|
| IBM.2107-D21-75FA120/R1-S11-P1-D1 | S0BE146 | U2107.921.75FA120 | 3603           | 11      | 1        | 145           |
| IBM.2107-D21-75FA120/R1-S11-P1-D2 | S0BE146 | U2107.921.75FA120 | 3603           | 11      | 1        | 145           |

| Diskrpm | Dkinf | Dkrate | Dkuse        | Arsite | Position | State  | Diskclass |
|---------|-------|--------|--------------|--------|----------|--------|-----------|
| 1000    | FCAL  | 2      | array member | S123   | 1        | normal | ENT       |
| 1000    | FCAL  | 2      | array member | S123   | 2        | normal | ENT       |

## Report field definitions

**ID** Specifies the system-assigned unique identifier for the DDM.

**Model** Specifies the DDM model. The model name is a string of the form *VRFCGGG*, where *VRFC* is the type of disk family and *GGG* is the disk capacity in GB.

**loc** Specifies the storage enclosure and the DDM location. The DDM location format is *Pn-Dn*, where *Pn* is the Planer number (1), and *Dn* is the DDM number (1 - 16).

### Firmwarelevel

Specifies the level of firmware that is installed on the specified DDM.

### DA pair

Specifies the device adapter pair ID. DA pairs are located in I/O enclosure pairs.



**Note:** An even-numbered DA pair ID indicates the first DA pair in an I/O enclosure pair. An odd-numbered DA pair ID indicates the second DA pair in an I/O enclosure pair.

**Dualloop**

Specifies the dual loop that the specified DDM resides on. The value is either 1 or 2.

**dkcap (10^9B)**

Specifies the DDM raw capacity in gigabytes.

**diskrpm**

Specifies the DDM rpm. One of the following values is displayed:

- 10000
- 15000

**dkinf** Specifies the DDM interface type. One of the following values are displayed:

- FC-AL
- FC-NL

**dkrate** Specifies the DDM interface rate.

**dkuse** Specifies the DDM usage in an array site. One of the following values are displayed:

- unassigned
- unconfigured
- spare required
- spare not required
- array member

**arsite** Specifies the array site ID.

**Position**

Specifies the DDM position in an array site configuration of DDMs.

**State** Specifies the current DDM state. One of the following values are displayed:

**Normal**

The storage device is operational and functional in its current disk usage.

**New**

Indicates the initial state when a DDM is inserted or first discovered.

**Installing**

A new storage device has been identified.

**Verifying**

The storage device is made accessible to the device adapter, its characteristics are determined, cabling is checked, and diagnostics are run.

**Formatting**

A verified storage device requires low-level formatting and the formatting operation is in progress.

**Initializing**

The storage device is being initialized with all zero sectors.

### **Certifying**

The storage device is read-accessed to determine that all sectors can be read.

### **Rebuilding**

The storage device is being rebuilt with data from the array that it is associated with.

### **Migration Target**

DDM migration is migrating another array member storage device to this spare storage device.

### **Migration Source**

DDM migration is migrating this array member storage device to another spare storage device.

### **Failed**

The storage device has failed and an immediate repair action is required.

### **Failed - Deferred Service**

The storage device has failed and a repair action is not immediately required.

### **Removed**

The storage device is removed from the system and removal has been processed by the system.

### **Inappropriate**

The storage device is incompatible with the system; for example, a storage device that has the wrong capacity or rpm. The DDM is not failed, because it can be valid for other systems and locations.

### **Inter failed**

Indicates that the DDM is faulty but still working.

### **PFSed**

Indicates that the DDM is prepared for service, and ready to be removed without impacting the system.

### **Diskclass**

Specifies the disk class as either high speed fibre channel disk drives or near-line disk drives. The value displayed is one of the following:

- **ENT** = Specifies enterprise and represents high speed fibre channel disk drives
- **NL** = Specifies near-line and represents ATA (FATA) disk drives

---

## **Storage unit configuration commands**

This section contains commands that are used to configure a storage unit.

Use the following commands to configure a storage unit and show storage unit information:

- **chsu**
- **lssu**
- **showsu**

The **chsu** command changes the description and name you have associated with a specified storage unit.

The **lssu** and **showsu** commands generate reports that allow you to view details about your storage units.

## chsu

The **chsu** command modifies a storage unit.

```
chsu [-desc new_su_description] [-name new_su_name] storage_unit_ID
```

### Parameters

**-desc** *new\_su\_description*

(Optional) Allows you to specify a description for the storage unit. The description is limited to 256 byte or 128 double-byte characters.

**-name** *new\_su\_name*

(Optional) Allows you to specify a user-defined name for the storage unit. This name is limited to 32 bytes or 16 double-byte characters.

*storage\_unit\_ID* | -

(Required) Accepts the fully qualified storage unit ID. The storage unit ID consists of manufacturer, machine type, and serial number. For example, IBM.1750-68FA120.

If you use the dash (-), the specified value is read from standard input. You cannot use the dash (-) while you are in the DS CLI interactive command mode.

### Example (1750)

#### Invoking the chsu command

```
dscli>chsu -name mystgunit IBM.1750-68FA120
```

#### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

```
Storage unit IBM.1750-68FA120 successfully modified.
```

## lssu

The **lssu** command displays a list of storage units in a storage complex. You can use this command to look at the status and other properties of each storage unit in the list.

```
lssu [-s] [-power on|off] storage_unit_ID
```

### Parameters

**-s** (Optional) Displays storage unit IDs. You cannot use the **-l** and the **-s** parameters together.

**-l** (Optional) Displays default output and remote mode with scheduled power-on and power-off times, and the storage unit description. You cannot use the **-l** and the **-s** parameters together.

**-power on | off**

(Optional) Displays only the storage units in the specified power state.

**storage\_unit\_ID . . . | -**

(Optional) Displays storage units with the specified storage unit IDs. A storage unit ID includes manufacturer, type, and serial number. You must separate multiple IDs with a space between each ID.

**Note:** You cannot specify ID ranges.

If you use the dash (-), the specified value is read from standard input.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following table represents the headers that are displayed on the output report that is associated with the **lssu** command using the **-l** parameter. A separate example is not shown for the 1750 because the information is the same for the 2107 and 1750. The only difference is the value input for the **storage\_unit\_ID** parameter.

### Invoking the lssu command

```
dscli>lssu -l
```

### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0  
DS: IBM.1750-75FA120

| Name | ID               | Model | WWNN             | Pw State | Pw Mode | Desc       |
|------|------------------|-------|------------------|----------|---------|------------|
| SU 1 | IBM.2107-75FA110 | 921   | 3007ACF3012399E0 | On       | Local   | Test       |
| SU 2 | IBM.2107-75FA120 | 921   | 3007ACF3045699E0 | On       | Local   | Production |
| SU 3 | IBM.2107-75FA130 | 921   | 3007ACF3078999E0 | On       | Local   | Backup     |

## Report field definitions

**Name** Specifies the user-defined name for each storage unit found within the storage complex. This value is null (-) if you have not assigned a name to a storage unit.

**ID** Specifies the storage unit ID which consists of the manufacture name, machine type, and serial number. When the **-s** parameter is used, this is the only information that is displayed for the **lssu** command.

### Model

Identifies the model number of the storage unit.

**WWNN**

Specifies the World Wide Node Name for the listed storage unit. This value is null (-) if the WWNN is not known

**Pw State**

Indicates the power status of the listed storage unit. One of the following values is displayed:

**On**

Indicates the storage unit power is on.

**Off**

Indicates the storage unit power is off.

**Turning On**

Indicates the storage unit power is in the process of turning on.

**Turning Off**

Indicates the storage unit power is in the process of turning off.

**Power Exception**

Indicates that storage unit power is on, but online operation is not possible due to a power fault in one of the storage unit frames.

**Pw Mode**

Indicates the power control mode in effect for the listed storage unit. One of the following values is displayed:

**Local**

Indicates that the SMC local/remote switch is set to the local power control mode.

**Remote SMC Manual**

Indicates that the SMC local/remote switch is set to remote and that the power control mode is set to manual power control.

**Remote SMC Auto**

Indicates that the SMC local/remote switch is set to remote and that the power control mode is set to auto-power control.

**Remote zSeries Power Control**

Indicates that the SMC local/remote switch is set to remote and that the power control mode is set to zSeries remote power control.

**Desc**

Specifies the description that you assigned the storage unit. This value is displayed as a null (-) if no description has been assigned.

**showsu**

The **showsu** command displays detailed properties of an individual storage unit.

```
►►—showsu—[storage_unit_ID]—————►►
```

**Parameters***storage\_unit\_ID*

(Required) Specifies the storage unit ID. A storage unit ID consists of manufacturer, machine type, and serial number.

If you use the dash (-), the specified value is read from standard input.

## Example

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following table represents the headers that are displayed on the output report that is associated with the **shows** command. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750.

### Invoking the shows command

```
dsccli>shows IBM.2107-75FA120
```

### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0

DS: IBM.2107-75FA120

| Name             | Desc                        | ID               | Model | WWNN                     | Config            |
|------------------|-----------------------------|------------------|-------|--------------------------|-------------------|
| My Stor-age Unit | This is my DS Stor-age Unit | IBM.2107-75FA120 | 921   | 3007ACF<br>3012399<br>E0 | One I/O interface |

| Pw State | Pw Mode | Reqpm                   | Processor Memory |
|----------|---------|-------------------------|------------------|
| On       | Local   | Remote<br>SMC<br>manual | 1 GB             |

## Report field definitions

**Name** Specifies the name that you assigned for the designated storage unit. This value is null (-) if you have not assigned a name to a storage unit.

**Desc** Specifies the description that you assigned for the designated storage unit. This value is displayed as a null (-) if no description has been assigned.

**ID** Specifies the storage unit ID which consists of the manufacture name, machine type, and serial number.

**Model** Identifies the model number of the designated storage unit.

### WWNN

Specifies the World Wide Node Name for the listed storage unit. This value is null (-) if the WWNN is not known.

### Config

Specifies the internal I/O interface configuration for the storage unit. One of the following values is displayed:

#### Undefined

Indicates that a configuration upgrade is in progress that causes the configuration option to change.

#### One I/O interface

Indicates that there is one dedicated I/O interface between the I/O enclosure pairs and storage enclosures.

#### Two I/O interfaces

Indicates that there are two dedicated I/O interfaces between the I/O enclosure pairs and storage enclosures.

**Four I/O interfaces**

Indicates that there are four dedicated I/O interfaces between the I/O enclosure pairs and storage enclosures.

**Six I/O interfaces**

Indicates that there are six dedicated I/O interfaces between the I/O enclosure pairs and storage enclosures.

**Pw State**

Indicates the power status of the listed storage unit. One of the following values is displayed:

**On**

Indicates the storage unit power is on.

**Off**

Indicates the storage unit power is off.

**Turning On**

Indicates the storage unit power is in the process of turning on.

**Turning Off**

Indicates the storage unit power is in the process of turning off.

**Power Exception**

Indicates that storage unit power is on, but online operation is not possible due to a power fault in one of the storage unit frames.

**Pw Mode**

Indicates the power control mode in effect for the listed storage unit. One of the following values is displayed:

**Local**

Indicates that the SMC local/remote switch is set to the local power control mode.

**Remote SMC Manual**

Indicates that the SMC local/remote switch is set to remote and that the power control mode is set to manual power control.

**Remote SMC Auto**

Indicates that the SMC local/remote switch is set to remote and that the power control mode is set to auto-power control.

**Remote zSeries Power Control**

Indicates that the SMC local/remote switch is set to remote and that the power control mode is set to zSeries remote power control.

**Reqpm**

Indicates the power control mode to apply when the local/remote switch is set to remote power control mode. One of the following values is displayed:

- Remote SMC Manual
- Remote SMC Auto
- Remote zSeries Power Control

**Note:** The default value is remote SMC Manual mode.

**Processor Memory**

Specifies the amount in gigabytes of processor memory configured on the storage unit.

---

## Storage image configuration commands

This section contains commands that are used to configure a storage image.

Use the following commands to configure a storage image and show storage image information:

- **chsi**
- **diagsi**
- **lsserver**
- **lssi**
- **showsi**

The **chsi** command primarily enables or disables the ESSNet user interface that invokes Copy Services operations for the storage image, changes the description and name that you have assigned to the storage image, or changes an iSystem serial number.

The **diagsi** command initiates a warm start on a DS6000 system.

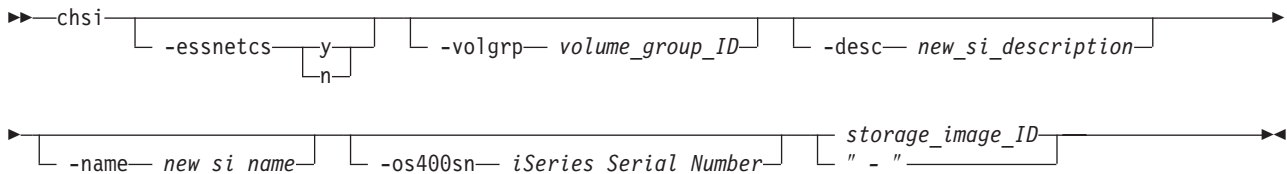
The **lsserver** command displays all the servers in a storage complex or a list of specified servers. The displayed list also provides the status information for each server including the LIC version number, operating system version number, and bundle version.

The **lssi** command with the **lsavailpprcport** and the **mkpprcpath** commands displays a list of storage images in a storage complex. These commands requires that you use the storage image WWNN, which is displayed for each storage image when you use the **lssi** command.

The **showsi** command displays the detailed properties of a storage image. In addition, the storage image WWNN is displayed for the specified storage image. The storage image WWNN is needed when you use the **lsavailpprcport** and **mkpprcpath** commands.

### chsi

The **chsi** command modifies a storage image. You can use it to set characteristics such as online or offline state, name, and description.



### Parameters

**-essnetcs y | n**

(Optional) Enables or disables the storage complex ESSNet user interface to invoke Copy Services operations for the storage image. **y** (yes) is the default.

**-volgrp volume\_group\_ID**

(Optional) Specifies the ESSNet Copy Services type volume group that contains the logical volumes that are eligible for control by Copy Services operations,



when the **-essnetcs y** parameter is used. All logical volumes are eligible for control by Copy Services operations if the **-essnetcs y** parameter and the volume group ID are not specified.

The **-volgrp** parameter accepts a fully qualified volume group ID including the storage image ID or a shortened version. The shortened version is a four-digit decimal number with no leading zeros, prefixed with the letter V.

**-desc** *new\_si\_description*

(Optional) Specifies the description that you assign to the storage image. The description is limited to 256 bytes or 128 double-byte characters.

**-name** *new\_si\_name*

(Optional) Specifies the name that you assign to the storage image. The storage image name is limited to 32-byte or 16 double-byte characters.

**-os400sn** *iSeries\_Serial\_Number*

(Optional) Specifies the new iSeries serial number.

The serial number consists of 3 hexadecimal characters. It uniquely identifies LUNs within a customer storage complex. It is appended to the unit serial number that is returned by a SCSI inquiry command that is directed to each LUN.

**Notes:**

1. You must restart your computer after you process this DS CLI command to assign a new serial number.
2. The iSeries serial number is only required when you have multiple DS\*\*\* machines with the last 3-digits of the machine serial number that overlap.

**storage\_image\_ID** | -

(Required) Specifies the storage image ID, which consists of the values for manufacturer, machine type, and serial number.

If you use the dash (-), the specified value is read from standard input. You cannot use the dash (-) while you are in the DS CLI interactive command mode.

## Example (1750)

### Invoking the chsi command

```
dscli>chsi -essnetcs n IBM.1750-68FA120
```

### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

```
Storage image IBM.1750-68FA120 successfully modified.
```

## diagsi

The **diagsi** command is an administrative utility command that a user with administrative or service authority can use for nonroutine diagnostic actions.

►►—diagsi— -action— warmstart— storage\_image\_ID—◄◄

Parameters

**Note:** Only users with administrator or service authority are authorized to use this command.

**-action warmstart**  
(Required) Specifies the administrative action to be performed.

**warmstart**  
The **-action warmstart** parameter initiates a warmstart on the storage image, which causes the storage image to collect microcode data that is useful in diagnosing problems. This action is restricted to the following usage rules:

- This action must only be used under the direction of IBM Service.
- You must be in interactive mode to issue this action. You cannot issue this action while in single shot mode or from a script.
- Five minutes must pass before you can reissue the **-action warmstart** parameter.
- If you issue the **-action warmstart** parameter more than 10 times during a 24-hour period, the warmstart will not collect the microcode diagnostic data.

*storage\_image\_ID*  
(Required) Accepts a fully qualified storage image ID. The storage image ID consists of manufacturer, machine type, and serial number.

Example

**Invoking the diagsi command**  
dscli>diagsi  
-action warmstart IBM.2107-68FA120

**The resulting output**  
Date/Time: Mon Oct 22 02:23:49 PST 2007 DS CLI Version: 5.0.0.0  
DS: IBM.2107-68FA120  
  
Warmstart on Storage Unit IBM.2107-68FA120 successfully completed

lsserver

The **lsserver** command displays all servers in a storage complex or a list of specified servers and it also displays the status information for each server in the list.



Parameters

- s (Optional) Displays the server ID. You cannot use the -l and the -s parameters together.
- l (Optional) Displays the default output and the state mode of the servers. You cannot use the -l and the -s parameters together.

*Server\_ID* . . . | -

(Optional) Displays the server information for the specified server IDs. This parameter accepts a fully qualified server ID, which includes the storage image ID or a shortened version without the storage image ID. The shortened version is a two-digit decimal number with no leading zeros.

Example: IBM.1750-13AAV3A/0

Example: IBM.1750-13AAV3A/1

**Note:** If you choose to use this parameter with a fully qualified storage image ID, ensure that you properly specify the server ID with the /x or /xx server designation. A properly coded **lsserver** command that designates the server ID looks like the following:

```
dscli>lsserver -l IBM.1750-68FA120/0
```

To specify a range of server IDs, separate the server IDs with a hyphen.

You must separate multiple server IDs or ranges of server IDs with a blank space between each ID or range of IDs.

If you use the dash (-), the specified value is read from standard input.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following table represents the headers that are displayed on the output report that is associated with the **lsserver** command using the **-l** parameter. Separate examples are shown for DS6000 and DS8000. The only difference is the value you input when you use the *Server\_ID* parameter.

### Invoking the lsserver command

```
dscli>lsserver -l
```

For **DS8000**:

### The resulting output

Date/Time: October 10, 2007 7:30:08 AM MST IBM  
DS CLI Version: 5.3.0.832 DS: IBM.2107-75FA120

| ID                  | Image ID | Image Name      | Power Control SFI | State  | LIC Version | OS Version | Bundle Version |
|---------------------|----------|-----------------|-------------------|--------|-------------|------------|----------------|
| IBM.2107-75FA120/00 | 1        | SF13003 20ESS01 | 0                 | Online | 5.3.0.832   | -          | -              |
| IBM.2107-75FA120/01 | 1        | SF13003 20ESS11 | 0                 | Online | 5.3.0.832   | -          | -              |

For **DS6000**:

### The resulting output

Date/Time: October 10, 2007 7:38:02 AM MST IBM  
DS CLI Version: 5.3.0.832 DS: IBM.1750-13AB76A

| ID                              | Image ID | Image Name | Power Control SFI | State  | LIC Version | OS Version           | Bundle Version |
|---------------------------------|----------|------------|-------------------|--------|-------------|----------------------|----------------|
| IBM.<br>1750–<br>13AB76A<br>/00 | -        | -          | 0                 | Online | 5.2.2.338   | 2007.6.<br>26.203005 | 5.2.2.338      |
| IBM.<br>1750–<br>13AB76A<br>/01 | -        | -          | 0                 | Online | 5.2.2.338   | 2007.6.<br>26.203005 | 5.2.2.338      |

## Report field definitions

**ID** Specifies the unique identifier of the server. This value includes the storage image ID and the server ID.

### Image ID

Specifies the image ID for the designated storage server. For a DS6000, this field will always report a dash.

### Image Name

Specifies the image name for the designated storage server. For a DS6000, this field will always report a dash.

### Power Control SFI

Specifies the storage server power control SFI.

**State** Specifies the current state of the designated server.

### LIC Version

Specifies the LIC version for the designated storage server.

### OS Version

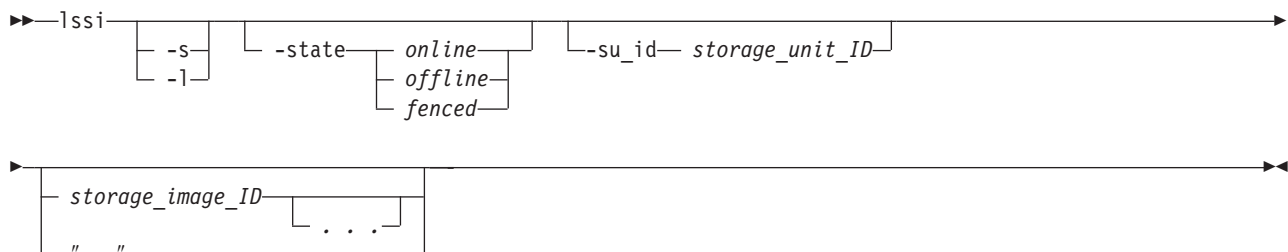
Specifies the operating system version for the designated server. For a DS8000, this field will always report a dash.

### Bundle Version

Specifies the bundle version for the designated storage server. For a DS8000, this field will always report a dash.

## Issi

The **Issi** command displays a list of storage images in a storage complex. You can use this command to look at the status of each storage image in the list. The storage image worldwide node name (WWNN) is displayed when this command is used. You must use the storage image WWNN with the **lsavailpprcport** and **mkpprcpath** commands.



## Parameters

- s** (Optional) Displays storage image IDs. You cannot use the **-l** and the **-s** parameters together.
- l** (Optional) Displays the default output, ESSNet, volume group, and storage image description. You cannot use the **-l** and the **-s** parameters together.
- state** *online | offline | fenced*  
(Optional) Displays only the storage images in the specified state.
- su\_id** *storage\_unit\_ID . . .*  
(Optional) Displays the storage images that are associated with the specified storage unit. A storage unit ID consists of manufacturer, machine type, and serial number.
- storage\_image\_ID . . . | -*  
(Optional) Accepts fully qualified storage image IDs. A storage image ID consists of manufacturer, machine type, and serial number. You must separate multiple IDs with a space between each ID.

**Note:** You cannot specify ID ranges.

If you use the dash (-), the specified value is read from standard input.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represents the headers that are displayed on the output report that is associated with the **lssi** command using the **-l** parameter. A separate example is not shown for the 1750 because the information is the same for the 2107 and 1750. There is a difference in the input values when you use the **su\_ID** and **storage\_image\_ID** parameters.

### Invoking the lssi command

```
dscli>lssi -l
```

### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0  
DS: IBM.2107-75FA120

| Name | ID               | Storage Unit     | Model | WWNN             |
|------|------------------|------------------|-------|------------------|
| DS 1 | IBM.2107-75FA120 | IBM.2107-75FA120 | 921   | 3007ACF3012399E0 |

| State  | ESSNet  | Volume Group | Desc                        |
|--------|---------|--------------|-----------------------------|
| Online | Enabled | -            | This is my DS storage Image |

## Report field definitions

**Name** Specifies the name that you assigned to the storage unit.

**ID** Specifies the storage image ID that consists of the manufacture, machine type, and serial number.

**Storage Unit**

Specifies the storage unit ID that consists of the manufacture, machine type, and serial number.

**Model** Specifies the model number that is associated with the storage unit.

**WWNN**

Specifies the worldwide node name that is assigned to the storage unit.

**State** Specifies the status of the storage unit. One of the following values are displayed:

**Online**

Indicates that the storage unit is capable of processing all functions.

**Offline**

Indicates that the storage unit is offline and not capable of processing any functions.

**Resuming**

Indicates that the storage unit is in the process of coming online.

**Quiescing**

Indicates that the storage unit is in the process of going offline.

**Quiesce Exception**

Indicates that the storage unit is in the quiesce exception state.

**Forced Quiescing**

Indicates that the storage unit is in the process of performing a force offline operation.

**Fenced**

Indicates that the storage unit has failed and is offline.

**Discovery**

Indicates that the storage unit is determining which physical configurations are available and updates itself when it discovers new hardware. (1750 only)

**ESSNet**

Specifies that the storage-complex ESSNet user interface can invoke Copy Services operations to this storage image. **Enabled** or **Disabled** are the values that are displayed in this field.

**Volume Group**

Specifies the ESSNet Copy Services Volume Group ID or displays a null (-) in this field.

If ESSNet Copy Services operations are enabled, the value that is displayed in this field specifies the ESSNet Copy Services type volume group. This volume group contains the logical volumes that can be controlled by Copy Services operations that are initiated through the ESSNet.

If ESSNet Copy Services operations are enabled and the ESSNet Copy Services Volume Group ID is not specified (represented by the null (-) value in this field), all logical volumes are eligible to be controlled by Copy Services operations that are initiated through the ESSNet.

**Desc** Specifies the value that you have assigned as a description for the storage unit.

## showsi

The **showsi** command displays detailed properties of a storage image. The storage image worldwide node name (WWNN) is displayed when this command is used. You must use the storage image WWNN with the **lsavailpprcport** and **mkpprcpath** commands.

►►—showsi—storage\_image\_ID—►►  
" \_ "

### Parameters

*storage\_image\_ID* | -

(Required) Specifies the storage image ID. A storage image ID consists of a manufacturer, machine type, and serial number.

If you use the dash (-), the specified value is read from standard input.

### Example

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represents the headers that are displayed on the output report that is associated with the **showsi** command. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750. The report displays the iSeries serial number for a 1750 machine type.

#### Invoking the showsi command

```
dscli>showsi
IBM.2107-75FA120
```

#### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0

DS: IBM.2107-75FA120

| Name             | Desc                        | ID               | Storage Unit     | Model | WWNN             | Signature      |
|------------------|-----------------------------|------------------|------------------|-------|------------------|----------------|
| My Storage Image | This is my DS storage Image | IBM.2107-75FA120 | IBM.2107-75FA120 | 921   | 3007ACF3012399E0 | 0123-4500-0000 |

| State  | ESSNet  | Volume Group | Os400 Serial | NVS Memory | Cache Memory | Processor Memory |
|--------|---------|--------------|--------------|------------|--------------|------------------|
| Online | Enabled | -            | -            | 8 GB       | 128 GB       | 1 GB             |

### Report field definitions

**Name** Specifies the name that you assigned to the storage unit.

**Desc** Specifies the value that you have assigned as a description for the storage unit.

**ID** Specifies the storage image ID that consists of the manufacture, machine type, and serial number.

**Storage Unit**

Specifies the storage unit ID that consists of the manufacture, machine type, and serial number.

**Model** Specifies the model number that is associated with the storage unit.

**WWNN**

Specifies the worldwide node name that is assigned to the storage unit.

**Signature**

Specifies the machine signature that is represented by 12 hexadecimal digits in the format *xxxx-xxxx-xxxx*.

**State** Specifies the status of the storage unit. One of the following values are displayed:

**Online**

Indicates that the storage unit is capable of processing all functions.

**Offline**

Indicates that the storage unit is not capable of processing any functions.

**Resuming**

Indicates that the storage unit is in the process of coming online.

**Quiescing**

Indicates that the storage unit is in the process of going offline.

**Quiesce Exception**

Indicates that the storage unit is in the quiesce exception state.

**Forced Quiescing**

Indicates that the storage unit is in the process of performing a force offline operation.

**Fenced**

Indicates that the storage unit has failed and is offline.

**Discovery**

Indicates that the storage unit is determining which physical configurations are available and updates itself when it discovers new hardware. (1750 only)

**ESSNet**

Specifies that the storage-complex ESSNet user interface can invoke Copy Services operations to this storage image. **Enabled** or **Disabled** are the values that are displayed in this field.

**Volume Group**

Specifies the ESSNet Copy Services Volume Group ID or displays a null (-) in this field.

If ESSNet Copy Services operations are enabled, the value that is displayed in this field specifies the ESSNet Copy Services type volume group. This volume group contains the logical volumes that can be controlled by Copy Services operations that are initiated through the ESSNet.

If ESSNet Copy Services operations are enabled and the ESSNet Copy Services Volume Group ID is not specified (represented by the null (-) value in this field), all logical volumes are eligible to be controlled by Copy Services operations that are initiated through the ESSNet.



### OS400Serial (1750 only)

Specifies null (-) for a 2107 model type and the iSeries serial number for a 1750 model type.

The serial number consists of 3 hexadecimal characters. It is used to uniquely identify LUNs within a customer's storage complex. It is appended to the unitSerialNumber that is returned by a SCSI inquiry command directed to each LUN.

### NVS Memory

Specifies the amount in gigabytes of nonvolatile storage (NVS) memory configured on the storage unit.

### Cache Memory

Specifies the amount in gigabytes of cache memory configured on the storage unit.

### Processor Memory

Specifies the amount in gigabytes of processor memory configured on the storage unit.

---

## I/O port and host connection configuration commands

This section contains storage image I/O port and host connection configuration commands.

Use the following commands to configure your storage image I/O ports and host connections and to display connection information.

### Storage image I/O port commands

This section contains commands that are used to configure storage image I/O port information and to display storage image I/O port information.

Use the following commands to configure storage image I/O ports and to display storage image I/O port information:

- **lsioport**
- **setioport**
- **showioport**

The **lsioport** command displays a list of I/O ports on a specified storage image and optionally provides performance metrics for each I/O port that is listed.

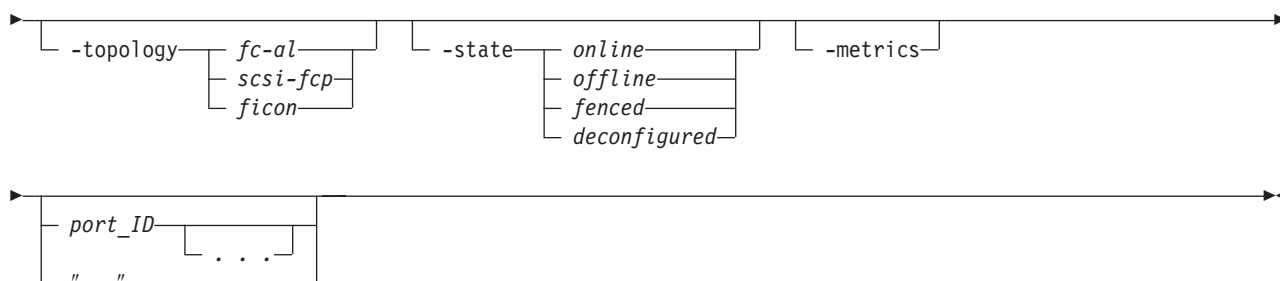
The **setioport** command configures one or more I/O ports for open systems or zSeries host system connections.

The **showioport** command displays the properties of a specified I/O port. It optionally displays the performance metrics for the I/O port.

### lsioport

The **lsioport** command displays a list of I/O ports on a specified storage image and optionally provides performance metrics for each I/O port that is listed.

```
►►—lsioport—[-dev— storage_image_ID—][-s—][-l—][-type— fc—]
```



## Parameters

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number.

**Note:** This parameter is required if you do not specify a fully qualified port ID and you do not specify a value for the *dev* variable in your profile file.

**-s** (Optional) Displays fully qualified port IDs. You cannot use the **-l** and **-s** parameters together.

**-l** (Optional) Displays default output plus the maximum login limit and the number of current logins. You cannot use the **-l** and **-s** parameters together.

**-type** *fc*

(Optional) Displays I/O ports of the specified port type.

**-topology** *fc-al | scsi-fcp | ficon*

(Optional) Displays fibre-channel I/O ports with the specified topology.

**-state** *online | offline | fenced | deconfigured*

(Optional) Displays I/O ports of the specified state.

**-metrics**

(Optional) Displays port ID and performance metrics for each port that is specified.

**Note:** All performance counts are an accumulation since the most recent counter wrap or counter reset operation. I/O port performance counters are reset with a storage unit power-on sequence.

*port\_ID* . . . | -

(Optional) Displays I/O ports that match the specified IDs. This parameter accepts a fully qualified port ID, which includes the storage image ID, or a shortened version without the storage image ID when the **-dev** parameter is specified.

A port ID is prefixed with the letter "I" and consists of four hexadecimal characters in the format *EEAP*, where:

- *EE* is an I/O port enclosure number in the range of 00 - 01 (1750 machine types).
- *A* is the adapter number and is specified as 0, 1, 2, or 3 (1750 machine types).
- *P* is the port number (0 - 3).

To specify a range of port IDs, separate the port IDs with a hyphen.

You must separate multiple port IDs or ranges of port IDs by a blank space between each ID or range of IDs.

If you use the dash (-), the specified value is read from standard input.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output reports that are associated with the **lsioport** command. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750.

### Invoking the lsioport command

```
dscli>lsioport -dev IBM.2107-75FA120 -l
```

### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0  
DS: IBM.2107-75FA120

| ID                     | WWPN            | State  | Type             | Topo     | Portgrp |
|------------------------|-----------------|--------|------------------|----------|---------|
| IBM.2107-75FA120/I0111 | 307BCF30A3299E0 | Online | Fibre Channel-LW | SCSI-FCP | 0       |

### Report field definitions (without the -metrics parameter)

**ID** Specifies the fully qualified port ID, which includes the storage image ID.

#### WWPN

Specifies the fibre channel worldwide port number. If the port type is not fibre channel, the value displayed is null (-).

**State** Specifies the current I/O port status. One of the following values can be displayed:

#### Online

Indicates that the storage unit is capable of processing all functions (default).

#### Offline

Indicates that the storage unit is not capable of processing any functions.

#### Resuming

Indicates that the storage unit is in the process of coming online.

#### Quiescing

Indicates that the storage unit is in the process of going offline.

#### Fenced

Indicates that the storage unit has failed and is offline.

#### Deconfigured

Indicates that the I/O port is in the process of being deleted.

**Type** Specifies the port type. The following values can be displayed:

- Fibre Channel-SW - (SW stands for short wave)
- Fibre Channel-LW - (LW stands for long wave)

**Topo** Specifies the I/O port topology. The following values can be displayed:

- FC-AL
- SCSI-FCP
- FICON
- Null (-) This value is displayed when the port type is not fibre channel.

**Portgrp** Specifies the identifier that associates a subset of the I/O ports that are operating in anonymous access mode. Default value is 0 when these subsets are not specified.

### Report field definitions (with -metrics parameter)

When you use the **-metrics** parameter and do not specify a port type, two reports are displayed. One report is for the FICON I/O port type and the other report is for the SCSI-FCP I/O port type. A banner is displayed (for example: ===FICON-Enabled I/O Ports===) before each report. A report is not displayed for a port type that has no ports that are enabled.

**FICON ports:** Each of the following headers and value types are displayed:

**ID** Specifies the fully qualified port ID.

**Date** Specifies the current time stamp for the I/O port performance counters. For example, 08/11/05 02:23:49 is the format that is used to report this value.

**byteread** Specifies the number of bytes that are read in 128 KB increments.

**bytewrit** Specifies the number of bytes that are written in 128 KB increments.

**Reads** Specifies a value that is based on extended count-key-data (ECKD) data received operations.

**Writes** Specifies a value that is based on ECKD data transferred operations.

**Timeread** Specifies a value that is based on the ECKD data that is received (read-accumulated time) on a channel. The displayed value is based on increments of 16 milliseconds.

**Timewrite** Specifies a value that is based on the ECKD data that is transferred (write-accumulated time) on a channel. The displayed value is based on increments of 16 milliseconds.

**SCSI-FCP ports:** Each of the following headers and value types are displayed:

**ID** Specifies the fully qualified port ID.

**Date** Specifies the current time stamp for the I/O port performance counters. For example, 08/11/05 02:23:49 is the format used to report this value.

**Bytewrit** Specifies a value for the remote mirror and copy data transferred operations in increments of 128 KB.

### Byteread

Specifies a value for the remote mirror and copy data received operations in increments of 128 KB.

**Writes** Specifies a value for the remote mirror and copy data transferred operations.

**Reads** Specifies a value for the remote mirror and copy data received operations.

### Timewrite

Specifies a value that is based on the remote mirror and copy data transferred (write-accumulated) time on a channel. The displayed value is based on increments of 16 milliseconds.

### Timeread

Specifies a value for the remote mirror and copy data received (read-accumulated) time on a channel. The displayed value is based on increments of 16 milliseconds.

### Byteread

Specifies a value that is based on the SCSI data received operations. The displayed value is based on increments of 128 KB.

### Reads

Specifies a value that is based on the SCSI data transferred operations.

**Writes** Specifies a value that is based on the SCSI data transferred operations.

### Timeread

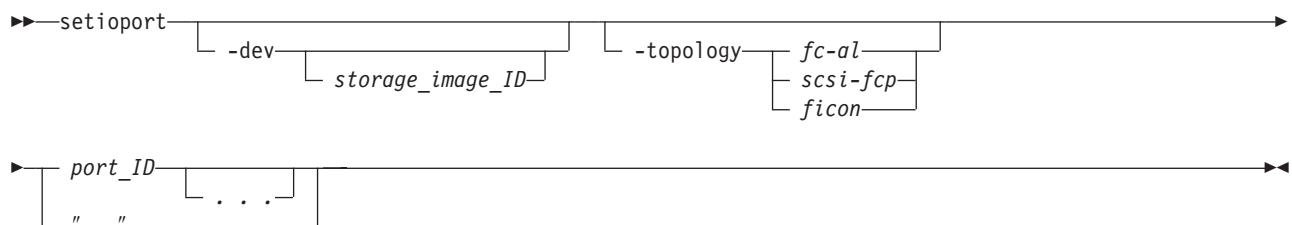
Specifies a value that is based on the SCSI data received (read-accumulated) time on a channel. The displayed value is based on increments of 16 milliseconds.

### Timewrite

Specifies a value that is based on the SCSI data transferred (write-accumulated) time on a channel. The displayed value is based on increments of 16 milliseconds.

## setioport

The **setioport** command configures one or more I/O ports for open systems or zSeries host system connections. This command cannot be used for ESCON ports.



## Parameters

**-dev** *storage\_image\_ID*

(Optional) Accepts a fully qualified storage image ID. The storage image ID consists of manufacturer, machine type, and serial number.

**Note:** This parameter is required if you do not specify a fully qualified port ID and you do not specify a value for the *dev* variable in your profile file.

(Optional) Sets the topology for an I/O port, either Fibre Channel Arbitrated Loop, SCSI-FCP, or FICON.

fibre channel arbitrated loop (code *fc-al*)

The fc-al topology setting enables the SCSI ULP with a FC-AL topology.

The FC-AL topology does not support PPRC path I/O operations.

## SCSI-FCP

The SCSI-FCP topology setting enables the SCSI ULP with a point-to-point or switched fabric topology. PPRC path I/O operations are enabled for this setting.

**ficon**

The ficon topology setting enables the FICON ULP with a point-to-point or switched fabric topology. PPRC path I/O operations are not supported for FICON ULP.

*port\_ID* . . . | -

(Required) Specifies the I/O port ID. Accepts a fully qualified port ID, which includes the storage image ID, or a shortened version without the storage image ID when the **-dev** parameter is specified.

A port ID is prefixed with letter *I* and consists of four hexadecimal characters in the format *EEAP*, where:

- *EE* is an I/O port enclosure number in the range of 00 - 01 (1750 machine types).
- *A* is the adapter number and is specified as 0, 1, 2, or 3 (1750 machine types).
- *P* is the port number (0 - 3).

To specify a range of port IDs, separate the port IDs with a hyphen.

You must separate multiple port IDs or ranges of port IDs by a blank space between each ID or range of IDs.

If you use the dash (-), the specified value is read from standard input.

### Example (1750)

## Invoking the setioport command

This example configures four I/O ports for FICON topology.

```
dscli>setioport -dev IBM.1750-68FA120 -topology ficon I0011 I0021 I0111 I0121
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120

I/O Port I0011 successfully configured.

```
I/O Port I0021 successfully configured.
```

```
I/O Port IO111 successfully configured.
```

I/O Port I0121 successfully configured.

**showioport**

The **showioperf** command displays properties of an I/O port. It optionally displays the performance metrics for a specific I/O port.

```
| ➡️—showioport—┐ ┌─── port_ID ──▶
```

└ -dev— storage\_image\_ID ┘   └-metrics┘   └ " - " ┘

## Parameters

### **-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which consists of the manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the port.

### **-metrics**

(Optional) Specifies that the port ID and the performance metrics for the specified I/O port be displayed.

**Note:** All performance counts are an accumulation since the most recent counter wrap or counter reset operation. I/O port performance counters are reset with a storage unit power-on sequence.

### *port\_ID* | -

(Required) Displays the property level details for the specified port IDs. This parameter accepts a fully qualified unique port ID, that is represented in the following format: manufacturer.machine type-serial number/portID.

For example, IBM.1750-68FA120/I0023

A port ID is prefixed with the letter *I* and consists of four hexadecimal characters in the format *EEAP*, where:

- *EE* is an I/O port enclosure number in the range of 00 - 01 (1750 machine types).
- *A* is the adapter number and is specified as 0, 1, 2, or 3 (1750 machine types).
- *P* is the port number (0 - 3).

If you use the dash (-), the specified value is read from standard input.

## Example

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output reports that are associated with the **showioport** command. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750.

### Invoking the showioport command to show port information

```
dscli>showioport -dev IBM.2107-75FA120 I0112
```

### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS:IBM.2107-75FA120
```

| ID                     | WWPN            | State  | Loc                       | Type             |
|------------------------|-----------------|--------|---------------------------|------------------|
| IBM.2107-75FA120/I0112 | 307ACF30A2399E0 | Online | U2107-75FA123-I1-P1-C2-T1 | Fibre channel-LW |

| Topo     | Portgrp | unkSCSIlog |
|----------|---------|------------|
| SCSI-FCP | 0       | -          |

## Report field definitions (without the -metrics parameter)

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ID</b>         | Specifies the fully qualified unique port ID.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>WWPN</b>       | Specifies the fibre channel I/O port worldwide port number (WWPN). If the port type is not fibre channel, this value is specified as a null (-).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>State</b>      | Specifies the current state of the I/O port. One of the following values is displayed:<br><b>Online</b><br>Indicates that the storage unit is capable of processing all functions (default).<br><b>Offline</b><br>Indicates that the storage unit is not capable of processing any functions.<br><b>Resuming</b><br>Indicates that the storage unit is in the process of coming online.<br><b>Quiescing</b><br>Indicates that the storage unit is in the process of going offline.<br><b>Fenced</b><br>Indicates that the storage unit has failed and is offline.<br><b>Deconfigured</b><br>Indicates that the I/O port is in the process of being deleted. |
| <b>Loc</b>        | Specifies the storage enclosure location by identifying the storage unit frame that contains the storage enclosure. The location format is <i>Utttt.mmm.ppsssss</i> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Type</b>       | Specifies the port type. The following values can be displayed: <ul style="list-style-type: none"><li>• Fibre Channel-SW - (SW stands for short wave)</li><li>• Fibre Channel-LW - (LW stands for long wave)</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Topo</b>       | Specifies the port topology. If the port type is not fibre channel, then the displayed value is null (-). One of the following values is displayed: <ul style="list-style-type: none"><li>• FC-AL</li><li>• SCSI-FCP</li><li>• FICON</li><li>• - (null if not fibre channel)</li></ul>                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Portgrp</b>    | Specifies an identifier that associates a subset of the I/O port objects that are operating in anonymous access mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>unkSCSIlog</b> | Specifies a list of unknown SCSI N-port WWPN identifiers that have attempted to login into this I/O port.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## Report field definitions (with the -metrics parameter)

|                 |                                                                                                                                                |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ID</b>       | Specifies the fully qualified port ID.                                                                                                         |
| <b>Date</b>     | Specifies the current time stamp for the I/O port performance counters. For example, 08/11/05 02:23:49 is the way that this value is reported. |
| <b>byteread</b> | Specifies the number of bytes that are read in increments of 128 KB.                                                                           |



**bytewrit**

Specifies the number of bytes that are written in increments of 128 KB.

**Reads**

Specifies a value that is based on the extended count-key-data (ECKD) architecture data received operations.

**Writes** Specifies a value that is based on the ECKD architecture data transferred operations.

**Timeread**

Specifies a value that is based on the ECKD data received (read-accumulated time) on a channel. The displayed value is based on increments of 16 milliseconds.

**Timewrite**

Specifies a value that is based on the ECKD data transferred (write-accumulated time) on a channel. The displayed value is based on increments of 16 milliseconds.

**Bytewrit**

Specifies a value for the remote mirror and copy data transferred operation in increments of 128 KB.

**Byteread**

Specifies a value for the remote mirror and copy data received operations in increments of 128 KB.

**Writes** Specifies a value for the remote mirror and copy data transferred operations.

**Reads** Specifies a value for the remote mirror and copy data received operations.

**Timewrite**

Specifies a value based on the remote mirror and copy data transferred (write-accumulated) time on a channel. The displayed value is based on increments of 16 milliseconds.

**Timeread**

Specifies a value for the remote mirror and copy data received (read-accumulated) time on a channel. The displayed value is based on increments of 16 milliseconds.

**Byteread**

Specifies a value that is based on the SCSI data received operations. The displayed value is based on increments of 128 KB.

**Reads**

Specifies a value that is based on the SCSI data received operations.

**Writes** Specifies a value that is based on the SCSI data transferred operations.

**Timeread**

Specifies a value that is based on the SCSI data received (read-accumulated) time on a channel. The displayed value is based on increments of 16 milliseconds.

**Timewrite**

Specifies a value that is based on the SCSI data transferred (write-accumulated) time on a channel. The displayed value is based on increments of 16 milliseconds.

## Host connection commands

This section contains commands that are used to configure host connections and to display host connection information.

Use the following commands to configure host connections and to display host connection information:

- **chhostconnect**
- **lshostconnect**
- **lshostvol**
- **lsportprof**
- **managehostconnect**
- **mkhostconnect**
- **rmhostconnect**
- **showhostconnect**
- **lshosttype**

The **chhostconnect** command modifies a SCSI host port configuration. You must ensure that the host port is offline to the host system before you process the **chhostconnect** command.

The **lshostconnect** command displays a list of host connections for a storage image and the status information for each host connection in the list.

The **lshostvol** command displays the mapping of host device names or volume names to machine type 2105, 2107, and 1750 volume IDs.

The **lsportprof** command displays a list of port profiles that are supported on a storage unit and their recommended address discovery and logical block size values. This command is particularly helpful to obtain the recommended values for the **mkhostconnect** command.

The **managehostconnect** command modifies the volume group assignment for a SCSI host port. Ensure that the host port is offline to the host system before you process the **managehostconnect** command.

The **mkhostconnect** command configures the open systems hosts port attachments to fibre-channel ports that are configured for FC-AL or SCSI-FCP topology.

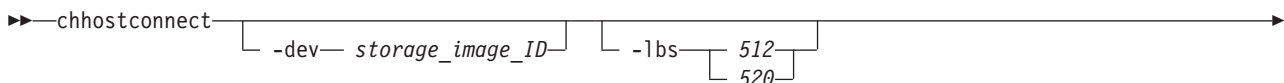
The **rmhostconnect** command removes a SCSI host port connection from a storage image.

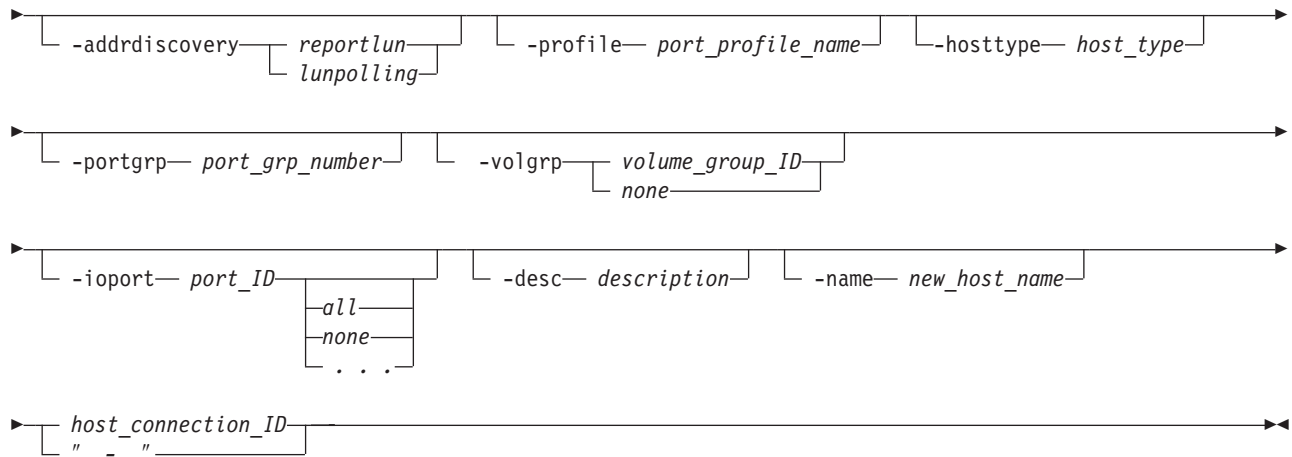
The **showhostconnect** command displays the detailed properties of a specified storage image host connection.

The **lshosttype** command displays a list of known hosts, their associated port profiles, address discovery, and logical block size values.

## chhostconnect

The **chhostconnect** command modifies a SCSI host port configuration.





## Parameters

### Notes:

1. The **chhostconnect** command can be disruptive to host system I/O operations if the affected host port is logged into the target storage unit. You must ensure that the host port is offline to the host system before you process the **chhostconnect** command.
2. Using the **-hosttype** parameter when you issue this command allows you to save input and processing time. The **-hosttype** parameter supplies the same information as if you had used the following three parameters:
  - **-profile**
  - **-addrdiscovery**
  - **-lbs**
3. If you are using the HP-UX operating system, see the volume restriction that is described under the **-addrdiscovery** parameter.

### **-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which consists of the manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified host connection ID.

Example of a fully qualified storage image ID: IBM.1750-68FA120

### **-lbs** *512 | 520*

(Optional) Specifies the logical block size that is used by the host system. The block size must be compatible with the volume group type and the volume type configurations that apply to the host port connection. The 520 logical block size is typically used by the IBM iSeries systems (OS/400).

### Notes:

1. You cannot use the **-lbs** parameter and **-hosttype** parameter together, but you can use each one separately.
2. If you do not use the **-hosttype** parameter, use the **lsportprof** command to determine the block size that you need to specify for the **-lbs** parameter.

**-addrdiscovery** *reportlun | lunpolling*

(Optional) Specifies the method for identifying logical unit number (LUN) addresses.

- The **reportlun** method specifies that the host system can access up to 64 000 LUNs.
- The **lunpolling** method specifies that the host system can access up to 256 LUNs.

**Notes:**

1. You cannot use the **-addrdiscovery** parameter and **-hosttype** parameter together, but you can use one separately.
2. For HP-UX operating systems, the number of volumes in the volume group must not exceed seven volumes. This restriction only applies when the **-addrdiscovery** parameter is set to *reportlun* and the associated volume group is of type **scsimap256**.

**-profile** *port\_profile\_name*

(Optional) Specifies the name of the host connection behavior profile. If the name includes a blank space, enclose the name with double quotation marks. For example, **-profile** "IBM pSeries – Sun".

**Notes:**

1. You cannot use the **-profile** parameter and the **-hosttype** parameter together, but you can use one separately.
2. If you do not use the **-hosttype** parameter, use the **lsportprof** command to obtain a list of available profiles.

**-hosttype** *host\_type*

(Optional) Specifies information about the following three parameters:

- **-profile**
- **-addrdiscovery**
- **-lbs**

**Notes:**

1. You cannot use the **-hosttype** parameter with the **-profile**, **addrdiscovery**, or **-lbs** parameters.
2. Use the **lshosttype** command to obtain a list of known host types.

**-portgrp** *port\_grp\_number*

(Optional) Specifies a user-assigned number that associates two or more host ports with access to a common volume group. Port group zero is reserved for ports that have not been associated with a port group.

**-volgrp** *volume\_group\_ID | none*

(Optional) Specifies an available volume group or no volume group if the *none* subparameter is used. This command accepts a fully qualified volume group ID including the storage image ID or a shortened version if the **-dev** parameter is specified. The shortened version is a four-digit decimal number with no leading zeros, prefixed with the letter V.

**Examples of -dev parameter use**

If you specify the **-dev** parameter, you can use the shortened version of the **-volgrp** parameter as follows:

```
dscli>chhostconnect -dev IBM.1750-68FA120 V11 1
```

where **1** represents the required parameter, *host\_connection\_ID*.

If you do not specify the **-dev** parameter and you specify the **-volgrp** parameter, you must use the fully qualified version of the volume group ID with the **-volgrp** parameter specified as follows:

```
dscli>chhostconnect -volgrp IBM.1750-68FA120/V11 IBM.1750-68FA120/1
```

where *IBM.1750-68FA120/1* or *IBM.2107-75FA120/1* represents the required parameter, *host\_connection\_ID*

A host connection can use only one volume group per storage image. In other words, a single WWPN can access only one volume group per storage image. Host operations cannot be initiated until a volume group ID is assigned.

If *none* is specified, the volume group ID assignment is removed from a SCSI host port object.

**-ioport** *port\_ID all|none| . . .*

(Optional) Specifies all, none, one, or more I/O port IDs that allow host connection access to volumes. This command accepts a fully qualified port ID including the storage image ID or a shortened version if the **-dev** parameter is specified.

**all** Specifies that you want to add all I/O port IDs. This allows the specified host connection access to the designated volume group through all the associated I/O port IDs.

**none** Specifies that you do not want to add any I/O ports. If you do not specify I/O ports, the storage unit is configured to allow host connection access to the specified volume group using any I/O port that is configured for FC-AL or SCSI-FCP topology.

**... (ellipsis)**

Specifies that you can designate up to 128 ports for an open systems host attachment assignment. If you enter a list of I/O port IDs, access from the specified host connection to the specified volume group is allowed using only the designated list of port IDs.

#### Examples of **-dev** parameter use

If you specify the **-dev** parameter, you can use the shortened version of the **-ioport** parameter as follows:

```
dscli>chhostconnect -dev IBM.1750-68FA120 -ioport I0102 1
```

where **1** represents the required parameter, *host\_connection\_ID*.

If you do not specify the **-dev** parameter and you specify the **-ioport** parameter, you must use the fully qualified version of the port ID with the **-ioport** parameter specified as follows:

```
dscli>chhostconnect -ioport IBM.1750-68FA120/I0102 IBM.1750-68FA120/1
```

where *IBM.1750-68FA120/1* or *IBM.2107-75FA120/1* represents the required parameter, *host\_connection\_ID*

A port ID is prefixed with the letter *I* and consists of four hexadecimal characters in the format *EEAP*, where:

- *EE* is an I/O port enclosure number in the range of 00 - 01 (1750 machine types).
- *A* is the adapter number and is specified as 0, 1, 2, or 3 (1750 machine types).

- *P* is the port number (0 - 3).

To specify a range of port IDs, separate the port IDs with a hyphen.

Separate multiple port IDs or ranges of port IDs with a comma between each ID or range of IDs.

**Note:** Changing the I/O port values can result in a disruption of current logins by the host systems.

**-desc** *description*

(Optional) Specifies the description that you defined for the SCSI host port. The description is limited to 256-byte or 128 double-byte characters.

**-name** *new\_host\_name*

(Optional) Specifies the user-assigned host system or port name. The name is limited to 32-byte or 16 double-byte characters.

*host\_connection\_ID* | -

(Required) Specifies the host connection ID, which is a unique identifier that uses any number from 0 - FFFE within the scope of a storage image. This parameter accepts a fully qualified ID or a shortened version if the **-dev** parameter is specified.

**Examples of -dev parameter use**

If you specify the **-dev** parameter, you can use the shortened version of the **host\_connection\_ID** parameter as follows:

```
dscli>chhostconnect -dev IBM.1750-68FA120 -desc newdescription 1
```

where *1* represents the value for the *host\_connection\_ID*.

If you do not specify the **-dev** parameter and you specify the **host\_connection\_ID** parameter, you must use the fully qualified version of the host connection ID as follows:

```
dscli>chhostconnect -desc newdescription IBM.1750-68FA120/1
```

If you use the dash (-), the specified value is read from standard input.

**Attention:** Use caution when you work with connection IDs to ensure that you have specified the correct connection that you want to change. For example, if you intend to make a change to connection ID 0005 and type 000, the system makes the change to connection ID 0. Or, if you want to make a change to connection ID 0020 and type 002, the system makes the change to connection ID 2. The system does not recognize the leading zeros, and 000 is interpreted as connection ID 0 and 002 is interpreted as connection ID 2.

## Example (1750)

### Invoking the chhostconnect command

```
dscli>chhostconnect
-dev IBM.1750-68FA120
-name host_1_port_2 1
```

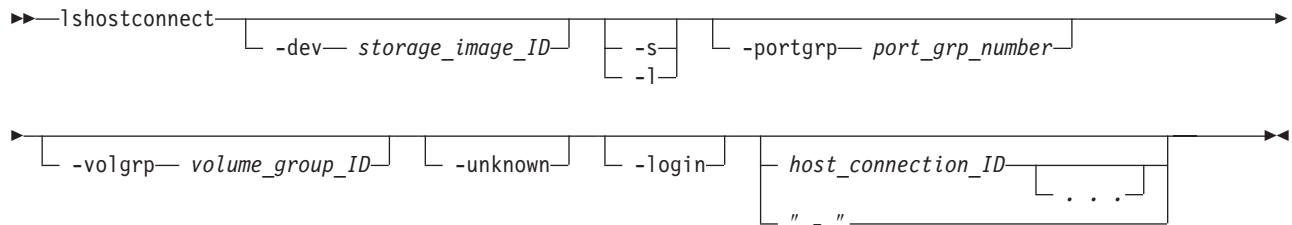
### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

```
Host connection 1 successfully modified.
```

## lshostconnect

The **lshostconnect** command displays a list of host connections for a storage image and the status information for each host connection in the list. You can also use this command to obtain a list of worldwide port numbers (WWPNs) from a system-detected-unknown host port. You can use these WWPNs to create a new host connection using the **mkhostconnect** command.



### Parameters

#### **-dev** *storage\_image\_ID*

(Optional) Displays the host connections for the specified storage image. A storage image ID consists of manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified host connection ID and you do not specify a value for the *dev* variable in your profile file.

Example of a fully qualified storage image ID: IBM.1750-68FA120

**-s** (Optional) Specifies the host connection IDs. You cannot use the **-l** and **-s** parameters together.

**-l** (Optional) Specifies the default output and your description for each host connection in the list. You cannot use the **-l** and **-s** parameters together.

#### **-portgrp** *port\_grp\_number*

(Optional) Specifies the host connections that have an associated group number.

**Note:** You cannot use the **-portgrp** parameter with the **-unknown** or **-login** parameters.

#### **-volgrp** *volume\_group\_ID*

(Optional) Specifies that only the host connections with the specified volume group ID be displayed. The volume group ID is a four-digit decimal number with no leading zeros, prefixed with the letter V.

**Note:** You cannot use the **-volgrp** parameter with the **-unknown** or **-login** parameters.

#### **-unknown**

(Optional) Specifies that a list of logged in host ports (WWPNs), that are not recognized as being associated with the designated storage unit, be displayed. This parameter generates a list report that contains the following three information fields:

- WWNN
- WWPN
- ESSIOport

**Note:** You cannot use the **-unknown** parameter with the **-portgrp**, **-volgrp**, **-login** or **host\_connection\_ID** parameters.

### **-login**

(Optional) Specifies that a list be displayed of host port (WWPNs) that are logged in and sorted by the ESS I/O port IDs for known connections. The report displays one line of information per connection. However, no information is displayed for a FICON connection.

#### **Notes:**

1. Known logins are those that you have created a host connection for, as well as Remote Mirror and Copy paths and anonymous connections.
2. You cannot use the **-login** parameter with the **-unknown**, **-portgrp**, **-volgrp**, or **host\_connection\_ID** parameters.

### **host\_connection\_ID . . . | -**

(Optional) Specifies that host connection information for the specified host connection IDs be displayed. This parameter accepts a fully qualified ID (includes *manufacture. machine type, serial number/hostconnectID*) or a shortened version if the **-dev** parameter is specified.

**Note:** You cannot use the **host\_connection\_ID** parameter with the **-login** or **-unknown** parameters.

If you use the dash (-), the specified value is read from standard input.

Example of a fully qualified host connection ID: IBM.1750-68FA120/2

Example of a shortened version host connection ID: 0002

## **Example**

**Note:** You can receive different reports when you use the **lshostconnect** command, one for the **-unknown** parameter, one for the **-login** parameter, one for the **-l** parameter, and one for the **-s** parameter. The reports that are associated with the **-unknown**, **-login**, and **-l** parameters are provided in this description.

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output reports that are associated with the **lshostconnect** command. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750.

### **Invoking the lshostconnect command without the -unknown parameter**

```
dscli>lshostconnect
-dev IBM.2107-75FA120 -l
```

### **The resulting output**

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
```



| Name           | ID                 | WWPN             | HostType | LBS | Addrdiscovery |
|----------------|--------------------|------------------|----------|-----|---------------|
| My host port 1 | IBM.2107-75FA120/1 | 3007ACF30A2399E0 | Unknown  | 512 | reportLUN     |
| My host port 2 | IBM.2107-75FA120/2 | 3007ACF30A2399E1 | Unknown  | 512 | reportLUN     |

| Profile           | portgrp | volgrpID | achtopo   | ESSIOport               | Desc  |
|-------------------|---------|----------|-----------|-------------------------|-------|
| IBM pSeries - AIX | 0       | V100     | SCSI -FCP | I0111,I0121 I0211,I0221 | SCSI1 |
| IBM pSeries - AIX | 0       | V100     | SCSI -FCP | All                     | SCSI2 |

## Example of lshostconnect using the -unknown parameter

### Invoking the lshostconnect command with the -unknown parameter

```
dscli>lshostconnect
-dev IBM.2107-75FA120 -unknown
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

| WWNN             | WWPN             | ESSIOport                  |
|------------------|------------------|----------------------------|
| 3007ACF30A239900 | 3007ACF30A2399E0 | I0111, I0121, I0211, I0221 |
| 3007ACF30A239900 | 3007ACF30A2399E1 | I0121                      |
| 3007ACF30A239900 | 3007ACF30A2399E2 | I0111, I0121, I0211, I0221 |
| 3007ACF30A239900 | 3007ACF30A2399E3 | I0111                      |

## Example of lshostconnect using the -login parameter

### Invoking the lshostconnect command with the -login parameter

```
dscli>lshostconnect
-dev IBM.2107-75FA120 -login
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

| WWNN             | WWPN             | ESSIOport | LoginType | Name    | ID |
|------------------|------------------|-----------|-----------|---------|----|
| 3007ACF30A239900 | 3007ACF30A2399E0 | I0111     | SCSI      | MyHostA | 1  |
| 3007ACF30A239900 | 3007ACF30A2399E1 | I0111     | SCSI      | MyHostB | 1  |
| 3007ACF30A239900 | 3007ACF30A2399E2 | I0221     | SCSI      | -       | -  |

## Report field definitions when the -unknown or -login parameter is not used

### Name

Host connection/SCSI port nickname.

The name is limited to 32-byte or 16 double-byte characters.

**ID** A fully qualified host connection ID: *manufacturer.type-serial number/hostconnectID*

The host connection ID component is a unique identifier (0 - FFFE) within the scope of a storage unit.

### WWPN

Specifies the worldwide port name (WWPN) for this host system port.

### HostType

Specifies the name of the host type.

*Unknown* is displayed when the information is not available and indicates that the host type was not specified when the host connection was created or modified.

### LBS

Specifies the logical block size that is used by the designated host system and host system port.

The logical block setting must be compatible with the volume group type that is configured for volume access. The 520 block size is typically used for IBM iSeries host system attachments.

### Addrdiscovery

Specifies the LUN address discovery method used by the designated host system and host system port.

The LUN Discovery method must be compatible with the volume group type that is configured for volume access.

The Poll LUNs method enables access to a maximum of 256 LUNs. The Report LUNs method enables access to a maximum of 64 000 LUNs.

### Profile

Specifies the name of the host connection behavior profile.

### Portgrp

Specifies the host port group ID. This ID ties together a group of SCSI host port objects that are accessing a common volume group. If the port group value is set to zero, the host port is not associated with any port group.

### VolgrpID

Specifies the volume group ID. This ID is a unique identifier within the DS6000 for the SCSI volume group that the specified SCSI host port is assigned to.

### Achtopo

Specifies the topology of the attached unit. This value is used to select which storage facility I/O ports are compatible with the attachment to the specified storage unit. One of the following values is displayed:

- Unknown
- SCSI-FCP
- FC-AL

### ESSIOport

Specifies the array of port IDs that the designated host port is logged into.

The port ID component is four hexadecimal characters in the format *EEAP*, where *EE* is a port enclosure number 00 - 01 for 1750, *A* is the adapter number 0 - 3 for 1750, and *P* is the port number (0 - 3). The number is prefixed with the letter *I*.

### Desc

Specifies the description that you defined for the SCSI host port. The description is limited to 256 byte or 128 double-byte characters.

## Report field definitions when the -unknown parameter is used

### WWNN

Specifies the worldwide node name for the designated host system.

### WWPN

Specifies the worldwide port name for the designated host system port.

### ESSIOport

Specifies the array of port IDs that the designated host port is logged into.

The port ID component is four hexadecimal characters in the format *EEAP*, where *EE* is a port enclosure number 00 - 01 for 1750, *A* is the adapter number 0 - 3 for 1750, and *P* is the port number (0 - 3). The number is prefixed with the letter *I*.

## Report field definitions when the -login parameter is used

### WWNN

Specifies the worldwide node name (WWNN) for this host system.

### WWPN

Specifies the worldwide port name (WWPN) for this host system port.

### ESSIOport

Specifies the port ID that the designated host port is logged into.

The port ID component is four hexadecimal characters in the format *EEAP*, where *EE* is a port enclosure number 00 - 01 for 1750, *A* is the adapter number 0 - 3 for 1750, and *P* is the port number (0 - 3). The number is prefixed with the letter *I*.

### LoginType

Specifies the type of login such as SCSI.

### Name

Specifies the name that you assigned to the host. If a name is not assigned, a null (-) value is displayed.

**ID** A fully qualified host connection ID: *manufacturer, machine type, serial number/hostconnectID*

The host connection ID component is a unique identifier (0 - FFFE) within the scope of a storage unit.

## lshostvol

The **lshostvol** command displays the mapping of host device names or volume names to machine type 2105, 2107, and 1750 volume IDs. (This command is not supported on the i5/OS.)

## Parameters

There are no parameters for this command.

### Notes:

1. The **lshostvol** command displays only volumes that are accessed using a direct fibre channel path when you use the command on an OpenVMS host system that is a member of an OpenVMS cluster. The command output does *not* display information about the following OpenVMS cluster devices:
  - Volumes to which the host system only has MSCP paths.
  - Volumes to which the host system uses only MSCP paths at this time even though it has both MSCP and direct paths.
2. If you do not have installed the IBM Multipath Subsystem Device Driver (SDD), the virtual path (vPath) name is not displayed.
3. On a Red Hat Enterprise Linux system, attached devices might be detected by the HBA driver, but they are not registered with the operating system. Normally, the operating system is set up to automatically detect all LUNS. However, if this does not occur automatically, you must issue the following for every volume (LUN):
 

```
echo
scsi add-single-device host# channel# lun# >/proc/scsi/scsi
```

If SDD is installed on your system, you can run the scsiscan script to detect all the LUNs.

## Example

The information that is displayed on the report that is generated from the **lshostvol** command is different depending on whether you have SDD installed. The following example tables indicate the differences.

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output reports that are associated with the **lshostvol** command. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750.

### Invoking the lshostvol command

```
dscli>lshostvol
```

### The resulting output with SDD installed

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.1750-75FA120
```

| Device/Volume Name  | Volume ID             | Vpath Name |
|---------------------|-----------------------|------------|
| my_vol_01,my_vol_04 | IBM.1750-75DA110/175D | vpath01    |
| my_vol_02,my_vol_05 | IBM.1750-75EA120/175E | vpath02    |
| my_vol_03,my_vol_06 | IBM.1750-75FA130/175F | vpath03    |
| my_vol_07,my_vol_09 | IBM.2105-29239/119E   | Vpath04    |

| Device/Volume Name  | Volume ID           | Vpath Name |
|---------------------|---------------------|------------|
| my_vol_08,my_vol_10 | IBM.2105-29239/119F | Vpath05    |

### The resulting output without SDD installed

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0  
DS: IBM.1750-75FA120

| Device/Volume Name | Volume ID             | Vpath Name |
|--------------------|-----------------------|------------|
| Hdisk01            | IBM.1750-75DA110/175D | -          |
| Hdisk02            | IBM.1750-75EA120/175E | -          |
| Hdisk03            | IBM.1750-75FA130/175F | -          |
| Hdisk07            | IBM.2105-29239/119E   | -          |
| Hdisk08            | IBM.2105-29239/119F   | -          |

### Report column definitions

#### Device/Volume name

Specifies the nickname you assigned to the device or volume. When SDD is installed, this column reports the volume name instead of the device name.

#### Volume ID

Specifies the ID of the storage unit.

#### Vpath name

Specifies the virtual path name. When SDD is not installed, this value is reported as null (-).

### Isportprof

The **Isportprof** command displays a list of port profiles that are supported on a storage unit and their recommended address discovery and logical block size values. You can use this command to view known values for the block size (**lbs**) and address discovery (**addrdiscovery**) parameters in the **mkhostconnect** command.

**Note:** Use this command to get the recommended values for the **mkhostconnect** command.

```

>>> lsportprof storage_image_ID
" _ "

```

### Parameters

*storage\_image\_ID* | -

(Required) Displays a list of port profiles for the specified storage image IDs. A storage image ID consists of manufacturer, type, and serial number.

If you use the dash (-), the specified value is read from standard input.

Example: IBM.1750-68FA120

Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following table represents the headers that are displayed on the output report that is associated with the **lsportprof** command. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750.

Invoking the lsportprof command

```
dscli>lsportprof IBM.2107-75FA120
```

The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

| Name                 | AddrDiscovery | LBS |
|----------------------|---------------|-----|
| IBM pSeries – AIX    | ReportLUN     | 512 |
| IBM pSeries – pLinux | LUNPolling    | 512 |

Report column definitions

**Name** Specifies the name of the host connection behavior profile. The port profile specifies a given host or operating system type.

AddrDiscovery

Specifies the address discovery method. One of the following values is displayed:

LUN Polling

Specifies that host system LUN access is limited to a maximum of 256 LUNs.

Report LUN

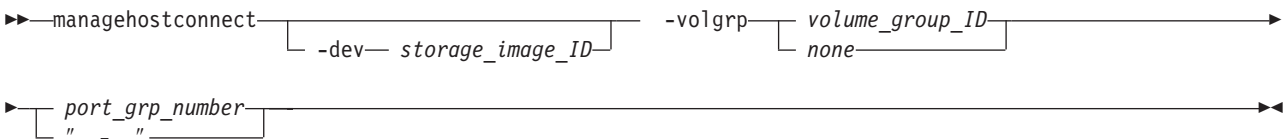
Specifies that host system LUN access is limited to a maximum of 64000 LUNs

**LBS** Specifies the logical block size. One of the following values is displayed:

- 512 - This value is displayed for all hosts except OS400.
- 520 - This value is displayed for an OS400 host.

managehostconnect

The **managehostconnect** command modifies the volume group assignment for a SCSI host port.



Parameters

Notes:

1. The **managehostconnect** command can be disruptive to host system I/O operations if the affected host port is logged onto the target storage

unit. Ensure that the host port is offline to the host system before you process the **managehostconnect** command.

2. This command is used more effectively after you have issued the **lshostconnect** or **showhostconnect** commands and have analyzed the reports that are generated by these commands. The information that is reported by these commands can help you ensure that you specify the correct port group number when you issue the **managehostconnect** command.

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which consists of the manufacturer, type, and serial number.

**-volgrp** *volume\_group\_ID* | *none*

(Required) Specifies that the SCSI host port connections that are associated with the specified port group number will be modified to access this volume group ID. A volume group ID is a four-digit decimal number with no leading zeroes, prefixed with the letter **V**.

If *none* is specified, the volume group ID assignment is removed from all SCSI host port objects that are associated with a common port group number.

Example: **-volgrp none**

*port\_grp\_number* | -

(Required) Specifies the SCSI host port group number that associates two or more host ports as having access to a common volume group.

If you use the dash (-), the specified value is read from standard input.

## Example (1750)

### Invoking the **managehostconnect** command

```
dscli>managehostconnect -dev IBM.1750-68FA120 -volgrp 11 1
```

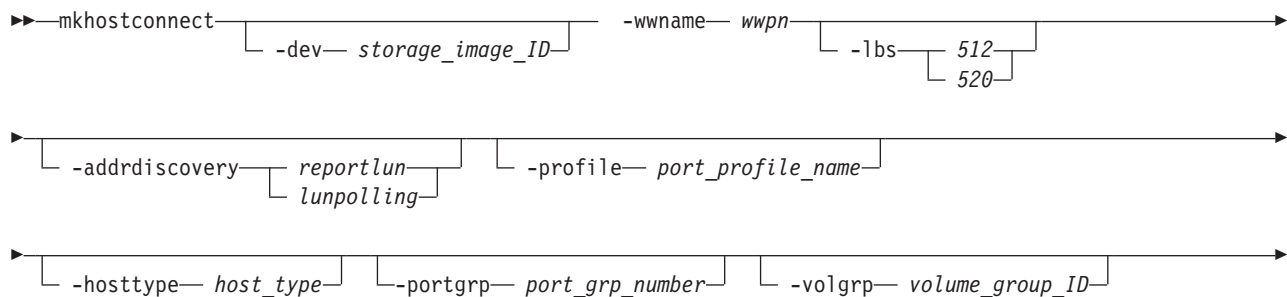
### The resulting output

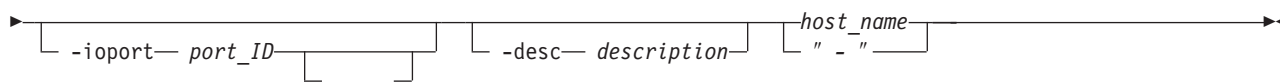
```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

```
Port group number 1 successfully modified.
```

## **mkhostconnect**

The **mkhostconnect** command configures open systems hosts port attachments to fibre-channel ports that are configured for FC-AL or SCSI-FCP topology. Open systems hosts port attachments to fibre-channel ports are configured for identified access mode and SCSI protocol.





## Parameters

**Notes:**

1. It is recommended that you use the **-hosttype** parameter when you issue this command, because doing so saves input and processing time. The **-hosttype** parameter supplies the same information as if you had used the following three parameters:
  - **-profile**
  - **-addrdiscovery**
  - **-lbs**
2. If you are using the HP-UX operating system, see the volume restriction that is described under the **-addrdiscovery** parameter.

```
-dev storage_image_ID
```

(Optional) Specifies the storage image ID, which includes the manufacturer, type, and serial number.

**-wwname** *wwpn*

(Required) Specifies the worldwide port name (WWPN). The WWPN is a 16-character hexadecimal ID. The names are host attachment specific; for example, 12341234000A000F.

-1bs 512 | 520

(Optional) Specifies the logical block size that is used by the specified host system, in bytes. The block size must be compatible with the volume group type and the volume type configurations that apply to the specified host port connection. The 520-byte size is typically used by IBM iSeries™ systems (OS/400®).

**Notes:**

1. Do not use the **-lbs** parameter if you specify the **-hosttype** parameter.
2. If you do not use the **-hosttype** parameter, use the **lsportprof** command to determine the block size that you need to specify.

```
-addrdiscovery reportlun | lunpolling
```

(Optional) Specifies the method for discovering logical unit number (LUN) addresses.

- The `reportlun` method specifies that the host system can access up to 64 000 LUNs.

**Note:** Use the `reportlun` method only with volume groups that are designated as *mask* type. (This designation is assigned when you use the `mkvolgrp` command to create the volume group.) However, you can use the `reportlun` method for a *map* type, but there are additional considerations if you are using an HP-UX operating system.

For HP-UX operating systems, the number of volumes in the volume group must not exceed seven volumes. This restriction only applies when the **-addrdiscovery** parameter is set to `reportlun` and the associated volume group is of type `scsimap256`.



- The lunpolling method specifies that the host system can access up to 256 LUNs. For Sun, Linux™, and Windows® operating systems, the lunpolling method is typically selected.

**Notes:**

1. Use the lunpolling method only with volume groups that are designated as *map* type. (This designation is assigned when you use the **mkvolgrp** command to create the volume group.)
2. Do not use the **-addrdiscovery** parameter if you specify the **-hosttype** parameter.

**-profile** *port\_profile\_name*

(Optional. If you specify the **-hosttype** parameter, this parameter is not used.) Specifies the name of the host connection behavior profile. If the name includes a blank space, enclose the name with double quotation marks. For example, **-profile** "IBM pSeries – AIX".

**Notes:**

1. Do not use the **-profile** parameter if you specify the **-hosttype** parameter.
2. If you do not use the **-hosttype** parameter, use the **lsportprof** command to obtain a list of available profiles.

**-hosttype** *host\_type*

(Optional) Specifies information about the following three parameters:

- **-profile**
- **-addrdiscovery**
- **-lbs**

**Notes:**

1. When the **-hosttype** parameter is specified, do not use the **-profile**, **addrdiscovery**, or **-lbs** parameters.
2. Use the **lshosttype** command to obtain a list of known host types.

**-portgrp** *port\_grp\_number*

(Optional) Specifies the identifier that associates two or more host ports with access to a common volume group. Port group zero is reserved for ports that have not been associated with a port group.

**-volgrp** *volume\_group\_ID*

(Optional) Specifies an available volume group. This parameter accepts a fully qualified volume group ID including the storage image ID or a shortened version. The shortened version is a four-digit decimal number with no leading zeroes, prefixed with the letter V.

A host connection uses only one volume group per storage image; that is, a single WWPN can access only one volume group per storage image.

**Note:** If you do not specify a volume group when a host connection is created, the value for volume group is displayed as a null (-) when you issue a **lshostconnect** or **showhostconnect** command.

**-ioport** *port\_ID . . .*

(Optional) Specifies all, none, one, or more I/O port IDs that allow host connection access to volumes.

Enter all to specify that you want all I/O ports added.

Enter none to specify that you do not want to add I/O ports. If you do not specify I/O ports, the image is configured to allow host connection access to the specified volume group using any I/O port that is configured for FC-AL or SCSI-FCP topology.

I/O ports cannot share the same WWPN. Ensure that there are no conflicts with the I/O ports of existing SCSI host connections.

You can select up to 128 ports for an open systems host attachment assignment. If you enter a list of I/O port IDs, access from this host connection to the specified volume group is allowed using only the specified list.

A port ID is four hexadecimal characters in the format *EEAP*, where:

- *EE* is an I/O port enclosure number in the range of 00 - 01 (1750 machine types).
- *A* is the adapter number and is specified as 0, 1, 2, or 3 (1750 machine types).
- *P* is the port number (0 - 3).

This number is prefixed with the letter *I*.

To specify a range of port IDs, separate the port IDs with a hyphen.

You must separate multiple port IDs or ranges of port IDs with a comma between each ID or range of IDs.

#### **-desc** *description*

(Optional) Specifies the description that you defined for the SCSI host port. The description is limited to 256 byte or 128 double-byte characters.

#### *host\_name* | -

(Required) Specifies your host system or port name, limited to 16 characters.

If you use the dash (-), the specified value is read from standard input.

### **Example (1750)**

#### **Invoking the mkhostconnect command**

```
dscli>mkhostconnect -dev IBM.1750-68FA120 -wwname 12341234000A000F
-profile "IBM pSeries - AIX" host_1_port_1
```

#### **The resulting output**

```
Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

```
Host connection 0 successfully created.
```

#### **rmhostconnect**

The **rmhostconnect** command removes a SCSI host port connection from a storage image.

```

>>— rmhostconnect — [-dev— storage_image_ID] [-quiet] [host_connection_ID] —————>>

```

### **Parameters**

#### **-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which consists of the manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for all host connections.

### **-quiet**

(Optional) Turns off the confirmation prompt.

*host\_connection\_ID* | -

(Required) Specifies the host connect ID, which is a unique identifier that uses any number from 0 - FFFE within the scope of a storage image. This parameter accepts a fully qualified ID (includes *manufacturer.type-serial number/hostconnectID*) or a shortened version if the **-dev** parameter is specified.

Example of a fully qualified host connection ID: IBM.1750-68FA120/2

If you use the dash (-), the specified value is read from standard input.

**Attention:** Use caution when you work with connection IDs to ensure that you have specified the connection that you want to delete. For instance, if you intend to delete connection ID 0005 and type 000, the system deletes connection ID 0. Or, if you want to delete connection ID 0020 and type 002, the system deletes connection ID 2. The system does not consider the leading zeros, and 000 is interpreted as connection ID 0 and 002 is interpreted as connection ID 2.

## **Example (1750)**

### **Invoking the rmhostconnect command**

```
dscli>rmhostconnect -dev IBM.1750-68FA120 1
```

### **The resulting output**

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

```
Are you sure you want to delete Host Connection IBM.1750-68FA120/1? y/n Y
Host Connection IBM.1750-68FA120/1 successfully deleted.
```

### **showhostconnect**

The **showhostconnect** command displays detailed properties of a storage image host connection.

```
►►—showhostconnect—┬─── storage_image_ID ┬─── host_connection_ID ──►►
```

## **Parameters**

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which consists of the manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the host connection.

*host\_connection\_ID* | -

(Required) Specifies a fully qualified host connection ID, which includes the manufacturer, type, and sequence number if the **-dev** parameter is not used. The host connection ID is a unique identifier (0 - FFFE) within the scope of a storage image.

If you use the dash (-), the specified value is read from standard input.

## **Example**

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **showhostconnect** command. A separate example is not shown for the 1750 because the information is the same for both the 1750 and 2107.

### Invoking the showhostconnect command

```
dscli>showhostconnect -dev IBM.2107-75FA120
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

| Name           | ID                 | WWPN             | HostType | LBS | Addrdiscovery |
|----------------|--------------------|------------------|----------|-----|---------------|
| My host port 1 | IBM.2107-75FA120/1 | 3007ACF30A2399E0 | Unknown  | 512 | reportLUN     |

| Profile           | Portgrp | VolgrpID | Achtopo   | ESSIOport                  | Desc  |
|-------------------|---------|----------|-----------|----------------------------|-------|
| IBM pSeries - AIX | 0       | 100      | SCSI -FCP | I0111,I0121<br>I0211,I0221 | SCSI1 |

### Report field definitions

#### Name

Specifies the host connection SCSI port nickname.

The name is limited to 32 byte or 16 double-byte characters.

#### ID

Specifies a fully qualified host connection ID.

The value that is represented by the *host\_connection\_ID* parameter is a unique identifier (0 - FFFE) within the scope of a storage unit.

#### WWPN

Specifies the worldwide port name (WWPN) for the designated host system port.

#### HostType

Specifies the name of the host type.

"Unknown" is displayed when the information is not available. This indicates that the host type was not specified when the host connection was created or modified.

#### LBS

Specifies the logical block size that is used by this host system and the host system port.

The logical block setting must be compatible with the volume group type that is configured for volume access. The 520 block size is typically used for IBM iSeries host system attachments.

#### Addrdiscovery

Specifies the LUN address discovery method that is used by this host system and the host system port.

The LUN Discovery method must be compatible with the volume group type that is configured for volume access.

The Poll LUNs method enables access to a maximum of 256 LUNs. The Report LUNs method enables access to a maximum of 64 000 LUNs.

### Profile

Specifies the name of the host connection behavior profile.

### Portgrp

Specifies the host port group ID. The ID ties together a group of SCSI host port objects that are accessing a common volume group. If the port group value is set to zero, the host port is not associated with any port group.

### VolgrpID

Specifies the volume group ID. This ID is a unique identifier within the DS6000 for the SCSI volume group that the specified SCSI host port is assigned to.

### Achtopo

Specifies the topology of the attached unit. This value is used to select which storage facility I/O ports are compatible with the attachment to the specified storage unit. One of the following values is displayed:

- Unknown
- SCSI-FCP
- FC-AL

### ESSIOport

Specifies the array of port IDs that the designated host port is logged into.

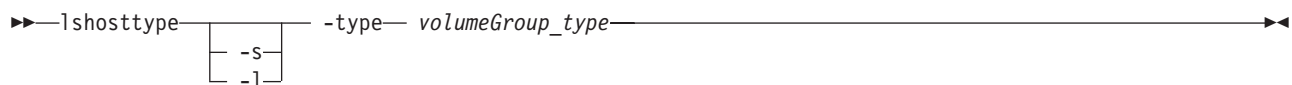
The port ID component is four hexadecimal characters in the format *EEAP*, where *EE* is a port enclosure number 00 - 01 for the 1750, *A* is the adapter number 0 - 3 for the 1750, and *P* is the port number (0 - 3). The number is prefixed with the letter I.

### Desc

Specifies the description you defined for the SCSI host port. The description is limited to 256 byte or 128 double-byte characters.

### lshosttype

The **lshosttype** command displays a list of known hosts, their associated port profiles, address discovery, and logical block size values. Use this command to get the available host types for the **mkhostconnect** command.



### Parameters

**-s** (Optional) Displays the host types only. You cannot use the **-l** and **-s** parameters together.

**-l** (Optional) Displays the default output for the specified host type. You cannot use the **-l** and **-s** parameters together.

**-type** *volumeGroup\_type*

(Required) Displays only those host types that are associated with the specified volume group type.

*volumeGroup\_type*

Only one type can be queried at a time. The following list provides the choices that can be specified.

- ficonall
- scsiall

- scsimask
- scsimap256
- os400all
- os400mask

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following table represents the headers that are displayed on the output report that is associated with the **lshosttype** command. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750.

### Invoking the lshosttype command

```
dscli>lshosttype -l -type
scsiall
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0

| Host Type | Profile           | AddrDiscovery | LBS | Description                                       |
|-----------|-------------------|---------------|-----|---------------------------------------------------|
| pSeries   | IBM pSeries - AIX | reportlun     | 512 | IBM pSeries, RS/6000 and RS/6000 SP Servers (AIX) |

## Report column definitions

### Host Type

Specifies the name of the specific host type.

### Profile

Specifies the name of the host connection behavior profile. The port profile specifies a given host or operating system type.

### AddrDiscovery

Specifies the address discovery method. One of the following values is displayed:

#### LUN Polling

Specifies that host system LUN access is limited to a maximum of 256 LUNs.

#### Report LUN

Specifies that host system LUN access is limited to a maximum of 64K LUNs

**LBS** Specifies the logical block size. One of the following values is displayed:

- 512 - This value is displayed for all hosts except OS400.
- 520 - This value is displayed for an OS400 host.

### Description

Specifies additional host type details.

# Storage configuration commands

This section contains storage configuration commands.

The following commands allow you to configure storage for zSeries and open system hosts.

## Array site specific commands

This section contains commands that are used to display array site information.

Use the following commands to display array site image information:

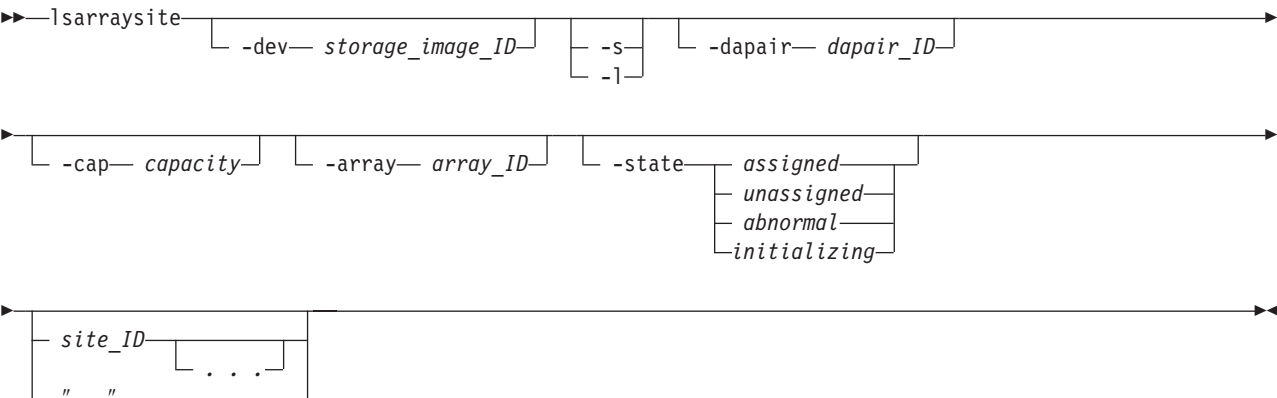
- **lsarraysite**
- **showarraysite**

The **lsarraysite** command generates a report that lists the array sites and status information for each array site in the list.

The **showarraysite** command generates a report that displays the detailed properties of a specific storage image array site.

### lsarraysite

The **lsarraysite** command displays a list of array sites and status information for each array site in the list.



### Parameters

- dev** *storage\_image\_ID*  
(Optional) Specifies the storage image ID, which consists of the manufacturer, type, and serial number. This parameter is required if the qualified site ID is not specified.
- s** (Optional) Displays the array ID. You cannot use the **-l** and the **-s** parameters together.
- l** (Optional) Displays the default output and the disk drive module rpm (revolutions per minute). You cannot use the **-l** and the **-s** parameters together.
- dapair** *dapair\_ID*  
(Optional) Displays array sites that are associated with a common device adapter pair ID. A device adapter pair ID is a two-digit decimal number with no leading zeros.

**-cap capacity**  
 (Optional) Displays in gigabytes (GB) the array sites that have the specified capacity of the disk drive module.

**-array array\_ID**  
 (Optional) Displays the array site that is associated with the specified array ID. An array ID is a four-digit decimal number with no leading zeros, prefixed with the letter A.

**-state assigned | unassigned | unavailable | initializing**  
 (Optional) Displays array sites that are in the specified state. One of the following values is displayed:

**assigned**  
 Specifies that the designated array site is defined as an array.

**unassigned**  
 Specifies that the array site is available to be defined as an array.

**unavailable**  
 Specifies that the designated array site is unassigned and at least one disk is not in the normal state. Also, the array site is not in the initializing state.

**initializing**  
 Specifies that the array site is unassigned and all disks are either in the normal or initializing state. Also, at least one disk is in the initializing state.

**site\_ID . . . | -**  
 (Optional) Displays array sites that have the specified IDs. An array site identifier is a four-digit decimal number with no leading zeros, prefixed with the letter S.

To specify a range of array site IDs, separate the array site IDs with a hyphen.

You must separate multiple array site IDs or ranges of array site IDs with a blank space between each ID or range of IDs.

If you use the dash (-), the specified value is read from standard input.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **lsarraysite** command using the **-l** parameter. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750.

### Invoking the lsarraysite command

```
dscli>lsarraysite -l
```

### The resulting output

| Arsite | DA pair | Dkcap<br>(10^9B) | Diskrpm | State    | Array | Diskclass |
|--------|---------|------------------|---------|----------|-------|-----------|
| S1     | 2       | 146.0            | 10000   | Assigned | A1    | ENT       |
| S2     | 2       | 146.0            | 10000   | Assigned | A0    | ENT       |



| Arsite | DA pair | Dkcap<br>(10^9B) | Diskrpm | State    | Array | Diskclass |
|--------|---------|------------------|---------|----------|-------|-----------|
| S3     | 2       | 146.0            | 10000   | Assigned | A3    | NL        |
| S4     | 2       | 146.0            | 10000   | Assigned | A2    | NL        |

## Report field definitions

**Arsite** Specifies the array site ID. The array site ID is a four-digit decimal number, with no leading zeros, prefixed with the letter S.

**Note:** The array site ID does not point to a physical location.

### DA pair

Identifies the DA pair ID. DA pairs are located in I/O enclosure pairs. The DA pair ID indicates the I/O enclosure location.

**Note:** An even-numbered DA pair ID indicates the first DA pair in an I/O enclosure pair. An odd-numbered DA pair ID indicates the second DA pair in an I/O enclosure pair.

### Dkcap (10^9 Byte)

Specifies the minimum disk capacity of the disks in the designated array site in gigabytes.

### Diskrpm

Specifies the minimum disk rpm of the disks in the designated array site.

**State** Specifies the array site state. One of the following values can be displayed in this field:

#### Assigned

Specifies that the designated array site is defined as an array.

#### Unassigned

Specifies that the array site is available to be defined as an array.

#### Unavailable

Specifies that the designated array site is unassigned and at least one disk is not in the normal state. Also, the array site is not in the initializing state.

#### Initializing

Specifies that the array site is unassigned and all disks are either in the normal or initializing state. Also, at least one disk is in the initializing state.

**Array** Specifies the array ID that this assigned array site is assigned to. The ID is prefixed by the letter A.

### Disk class

Specifies the disk class as either high speed fibre-channel disk drives or near-line disk drives. The displayed value is one of the following:

**ENT** Specifies enterprise and represents high-speed fibre channel disk drives.

**NL** Specifies near-line and represents ATA (FATA) disk drives

## showarraysite

The **showarraysite** command displays detailed properties of a specific storage image array site.

```

>> showarraysite [-dev storage_image_ID] [site_ID]

```

## Parameters

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the site ID.

*site\_ID* | -

(Required) Specifies that information be displayed for the designated array site ID. This parameter also accepts a fully qualified site ID, which consists of the storage image ID or a shortened version without the storage image ID, if the **-dev** parameter is specified. The shortened version is a four-digit decimal number with no leading zeros, prefixed by the letter S. The array site ID does not imply a physical location.

If you use the dash (-), the specified value is read from standard input.

## Example

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **showarraysite** command. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750.

### Invoking the showarraysite command

```

dscli>showarraysite
-dev IBM.2107-75FA120 S11

```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

| arsite                   | DA pair                | dkcap<br>(10^9B) | Diskrpm | State    |
|--------------------------|------------------------|------------------|---------|----------|
| IBM.2107-75FA120/<br>S11 | IBM.2107-75FA120<br>/0 | 146              | 15000   | Assigned |

| Array                    | Dkrate<br>(GB/sec) | DDMSN                | Spares | dataDDM | Diskclass |
|--------------------------|--------------------|----------------------|--------|---------|-----------|
| IBM.2107-75FA120<br>/A44 | 2                  | 0123456789<br>ABCDEF | 0      | 8       | NL        |

## Report field definitions

**Arsite** Specifies the array site ID. The array site ID is a four-digit decimal number, no leading zeros, prefixed by the letter S.

### Notes:

1. IBM 1750 array sites consist of four DDMs.

2. The array site ID does not imply a physical location.

**DA pair**

Specifies the DA pair ID. DA pairs are located in I/O enclosure pairs. DA pair ID implies the I/O enclosure location.

**Dkcap (10^9B)**

Specifies the minimum disk capacity of the disks in the designated array site.

**Diskrpm**

Specifies the minimum disk rpm of the disks in the designated array site.

**State** Specifies the array site state. The values that can be displayed in this field are as follows:

**assigned**

Specifies that the designated array site is defined as an array.

**unassigned**

Specifies that the array site is available to be defined as an array.

**unavailable**

Specifies that the designated array site is unassigned and at least one disk is not in the normal state. Also, the array site is not in the initializing state.

**initializing**

Specifies that the array site is unassigned and all disks are either in the normal or initializing state. Also, at least one disk is in the initializing state.

**Array** Specifies the array ID that the designated array site is assigned to. The ID is prefixed by the letter *A*.

**Dkrate**

Specifies the minimum disk interface rate of the disks in the designated array site.

**DDMSN**

Specifies the list of DDM serial numbers (SN) that are associated with the designated array site. Each DDM SN is a 16-character string. Each serial number is separated by a comma.

**Spares**

Specifies the number of spare DDMs that are allocated from the array site.

**DataDDM**

Specifies the number of data DDMs. This value is based on the number of DDMs minus the number of spares.

**Disk Class**

Specifies the disk class as either high speed fibre channel disk drives or near-line disk drives. The displayed value is one of the following:

**ENT** Specifies enterprise and designates a high-speed fibre channel disk drive.

**NL** Specifies near-line and represents ATA (FATA) disk drives.

## Array specific commands

This section contains commands that are used to create and delete arrays and to display array information.

Use the following commands to create and delete arrays and to display array information:

- **lsarray**
- **mkarray**
- **rmarray**
- **showarray**

The **lsarray** command generates a report that displays a list of arrays in a storage image and the status information for each array in the list.

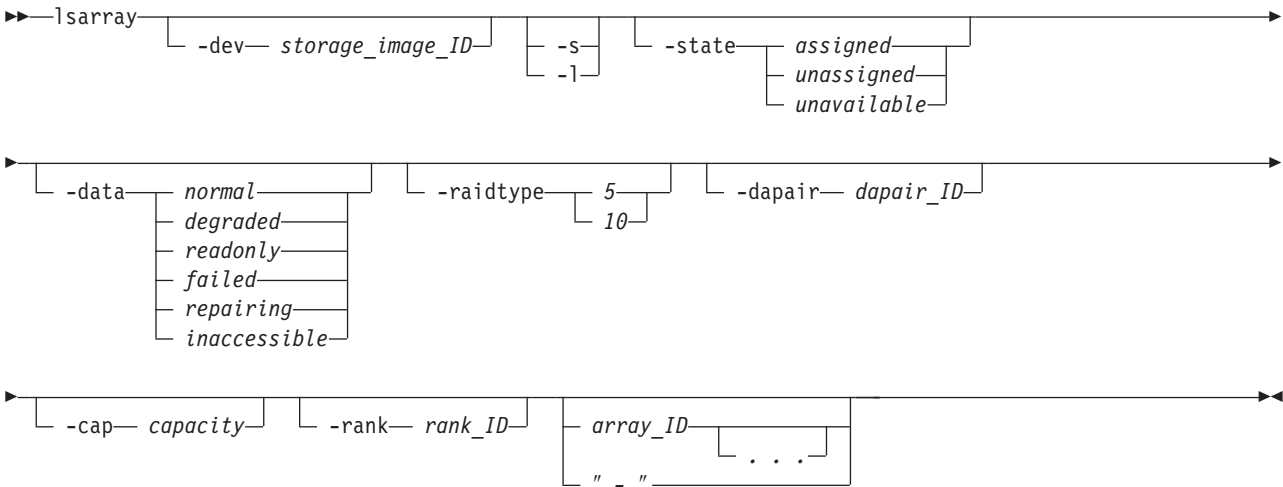
The **mkarray** command creates one array per command.

The **rmarray** command removes the specified array or arrays from the storage unit.

The **showarray** command generates a report that displays the detailed properties of a specific array.

### lsarray

The **lsarray** command displays a list of arrays in a storage image and status information for each array in the list.



### Parameters

- dev** *storage\_image\_ID*  
(Optional) Specifies the storage image ID, which includes the manufacturer, machine type, and serial number. This parameter is required if the fully qualified array ID is not specified.
- s** (Optional) Specifies that only the array ID information be displayed on the generated report. You cannot use the **-l** and the **-s** parameters together.
- l** (Optional) Specifies that all information about the array including the array ID be displayed on the generated report. You cannot use the **-l** and the **-s** parameters together.
- state** *assigned | unassigned | unavailable*  
(Optional) Specifies that information about those arrays that are in the designated state be displayed on the generated report.

**-data** *normal | degraded | readonly | failed | repairing | inaccessible*  
 (Optional) Specifies that information about those arrays that are in the designated data state be displayed on the generated report.

**-raidtype** *5 | 10*  
 (Optional) Displays only those arrays with the specified RAID type, 5 or 10.

**-dapair** *dapair\_ID*  
 (Optional) Displays only the array that is specified by the device adapter pair ID. A device adapter pair ID is a two-digit decimal number with no leading zeros.

**-cap** *capacity*  
 (Optional) Displays in gigabytes (GB) only the array with the specified DDM capacity. You can specify up to three digits after the decimal point, for example -cap 144.7.

**-rank** *rank\_ID*  
 (Optional) Displays only the array that is assigned to the specified rank ID. A rank ID is a four-digit decimal number with no leading zeros, prefixed with the letter R.

**array\_ID . . . | -**  
 (Optional) Displays array information for the specified arrays. An array ID is a four-digit decimal number with no leading zeros, prefixed with the letter A.

To specify a range of array IDs, separate the array IDs with a hyphen. For example: A10-A12 (equates to A10 A11 A12)

You must separate multiple array IDs or ranges of array IDs with a blank space between each ID or range of IDs. For example: A11 A12 A14-A16. Your command in this case could look like:

```
dscli>lsarray IBM.1750-68FA120 -l A11 A12 A14-A16
```

If you use the dash (-), the specified value is read from standard input. You cannot use the dash (-) while you are in the DS CLI interactive command mode.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **lsarray** command using the **-l** parameter. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750.

### Invoking the lsarray command

```
dscli>lsarray -dev IBM.2107-75FA120 -l
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

| Array | State    | Data   | RaidType |
|-------|----------|--------|----------|
| A10   | Assigned | Normal | 5(6+p)   |
| A11   | Assigned | Normal | 5(7+p)   |
| A12   | Assigned | Normal | 5(6+p)   |

| Array | State      | Data   | RaidType |
|-------|------------|--------|----------|
| A13   | Unassigned | Normal | 5(7+p)   |

| Arsite | Rank | DA Pair | DDMcap<br>(10^9B) | Diskclass |
|--------|------|---------|-------------------|-----------|
| S20    | R11  | 10      | 145               | ENT       |
| S21    | R12  | 11      | 145               | ENT       |
| S30    | R13  | 20      | 300               | NL        |
| S31    | -    | 21      | 300               | NL        |

## Report field descriptions

**Array** Specifies the array number. The array number starts with the prefix *A*, followed by a four-digit decimal number with no leading zeros (for example, A44).

**State** Specifies the relationship between the array and a rank. One of the following values is displayed:

### Assigned

The array is assigned to a rank.

### Unassigned

The array is not assigned to a rank and all of the storage devices that are indicated by the disk serial numbers attribute are in the normal state.

### Unavailable

The array is not assigned to a rank and one or more of the disk drive modules (DDMs) that are indicated by the disk serial numbers attribute are not in the normal state.

**Data** This value reflects the current data status. One of the following values is displayed:

### Normal

The array is in the Normal data state if none of the other data states applies. This status applies if the array is unassigned.

### Degraded

The array is in the Degraded data state if both of the following conditions exist:

- The Read-only, Failed, Repairing, or Inaccessible data states do not apply.
- One or more redundancy groups are rebuilding (that is, there is a DDM with a rebuilding state in the array).

### Read Only

The array is in the Read-only data state if all of the following conditions exist:

- The Failed, Repairing, and Inaccessible data states do not apply.
- One or more DDMs have failed.
- There are insufficient spares to support all rebuild operations.
- Continued write operation without redundancy could result in data loss.

### Failed

The array is in the Failed data state if all of the following conditions exist:

- The Repairing and Inaccessible data states do not apply.
- Two or more DDMs in the array have failed.
- There are insufficient DDMs left in the array to rebuild the data that was lost on the failing storage devices.

### Repairing

The array is in the Repairing data state if all of the following conditions exist:

- The Inaccessible data status does not apply.
- The array has previously entered the failed state.
- The repair array function has been accepted.
- The repair array function has not completed.

### Inaccessible

The array is in the Inaccessible data state if the storage unit cannot access a set of storage devices that are sufficient to access all the data on the array.

### RaidType

Indicates the type of RAID array (5 or 10) and the array configuration (for example, 6+P).

**arsite** Indicates the array sites that are associated with the array.

**Rank** Specifies the rank the array is assigned to. The value is displayed as a combination of a Storage Image ID and a rank number. The rank number is the prefix *R*, followed by a four-digit decimal number, with no leading zeros (for example, R26).

### DA pair

Identifies the DA pair ID. DA pairs are located in I/O enclosure pairs. DA pair ID indicates the I/O enclosure location.

**Note:** An even-numbered DA pair ID indicates the first DA pair in an I/O enclosure pair. An odd-numbered DA pair ID indicates the second DA pair in an I/O enclosure pair.

### DDMcap (10<sup>9</sup> Byte)

Indicates the minimum disk capacity (10<sup>9</sup> Byte) of the storage devices (DDMs) in the specified array.

### Disk class

Specifies the disk class as either high speed fibre-channel disk drives or near-line disk drives. The displayed value is one of the following:

**ENT** Specifies enterprise and represents high speed fibre-channel disk drives

**NL** Specifies near-line and represents ATA (FATA) disk drives

### mkarray

The **mkarray** command creates one array per command. You can specify multiple array sites if you are working with a DS6000 machine type but only one array site can be specified for a DS8000 machine type.

```

▶▶ mkarray ─────────────────── -raidtype ─ 5 ─ -arsite ─ array_site ───────────────────▶
 │ ─ -dev ─ storage_image_ID ─ │ ─ 10 ─ │

```

## Parameters

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified array site.

**-raidtype** 5 | 10

(Required) Specifies a RAID type for the array.

**-arsite** *array\_site* | , . . .

(Required: DS8000 explanation) Specifies the array site for the array. An array site number is a four-digit decimal number with no leading zeros, prefixed with the letter S.

Example of fully qualified array site: IBM.2107-75FA120/S11

(Required: 1750 explanation) Specify one or two array sites for IBM 1750 RAID types 5 and 10. If there are two array sites, both must be associated with a common DA pair ID. An array site number is a four-digit decimal number with no leading zeros, prefixed with the letter S. Separate the two array sites by commas with no blank space in between. Example: S10,S11.

## Example (1750)

### Invoking the mkarray command

```
dscli>mkarray -dev IBM.1750-68FA120 -raidtype 10 -arsite S10,S11
```

### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

```
Array A10 successfully created.
```

## rmarray

The **rmarray** command deletes arrays.

```

▶▶ rmarray ─────────────────── -dev ─ storage_image_ID ─ ─ -quiet ─ ─ array_ID ─ ───────────────────▶
 │ ─ -dev ─ storage_image_ID ─ │ ─ -quiet ─ │ ─ array_ID ─ │ ─ . . . ─ │
 │ ─ " - " ────────────────────┘

```

## Parameters

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for all array IDs.

**-quiet**

(Optional) Turns off the confirmation prompt for this command.

*array\_ID* . . . | -

(Required) Specifies the array IDs that are to be deleted. Accepts a fully qualified array ID, which includes the storage image ID, or a shortened version



without the storage image ID if the **-dev** parameter is specified. The shortened version is a four digit decimal number with no leading zeros, prefixed by the letter "A".

To specify a range of array IDs, separate the array IDs with a hyphen.

You must separate multiple array IDs or ranges of array IDs with a blank space between each ID or range of IDs.

If you use the dash (-), the specified value is read from standard input.

| **Note:** You cannot use the dash (-) while you are in the DS CLI interactive  
| command mode.

**Example (1750)**

**Invoking the rmarry command**

dscli>rmarry -dev IBM.1750-68FA120 A44

**The resulting output**

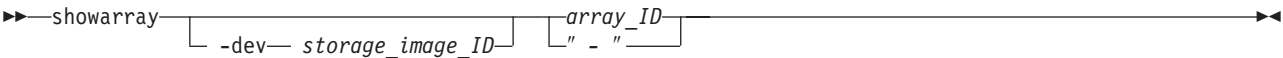
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120

Are you sure you want to delete array IBM.1750-68FA120/A44? [y/n]: Y

Array Storage Image ID/A44 successfully deleted.

**showarray**

The **showarray** command displays detailed properties of a specific array.



**Parameters**

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which consists of the manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the array.

*array\_ID* | -

(Required) Specifies the array ID that you want to view. This parameter accepts a fully qualified array ID, which consists of the storage image ID, or a shortened version without the storage image ID if the **-dev** parameter is specified. The shortened version is a four-digit decimal number with no leading zeros, prefixed by the letter A.

| If you use the dash (-), the specified value is read from standard input.

**Example**

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **showarray** command. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750.

**Invoking the showarray command**

```
dsccli>showarray -dev IBM.2107-75FA120 A44
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

| Array                | SN      | State    | Datastate | RaidType | Arsite |
|----------------------|---------|----------|-----------|----------|--------|
| IBM.2107-75FA120/A44 | AZ123AQ | Assigned | Normal    | 5 (6+P)  | S21    |

| Rank                 | DA Pair             | DDMcap<br>(10^9B) | DDMRPM | Interface<br>Type | Interrate<br>(GB/secs) | Diskclass |
|----------------------|---------------------|-------------------|--------|-------------------|------------------------|-----------|
| 2107-75FA<br>123/R26 | 2107-75FA<br>123/11 | 145               | 15000  | FCAL              | 2                      | ENT       |

### Report field definitions

**Array** Specifies the array ID number. The array ID number starts with the prefix *A*, followed by a four-digit decimal number with, no leading zeros (for example, A44).

**SN** Specifies the unique internal identifier for the data space of the designated array (for example, AZ123AQ).

**State** Specifies the array state. One of the following values is displayed:

#### **Assigned**

The array is assigned to a rank.

#### **Unassigned**

The array is not assigned to a rank and all of the storage devices that are indicated by the disk serial numbers attribute are in the normal state.

#### **Unavailable**

The array is not assigned to a rank and one or more of the disk drive modules (DDMs) that are indicated by the disk serial numbers attribute are not in the normal state.

### **Datastate**

Specifies the current data state. One of the following values is displayed:

#### **Normal**

The array is in the Normal data state if none of the other data states applies. This status applies if the array is unassigned.

#### **Degraded**

The array is in the Degraded data state if both of the following conditions exist:

- The Read-only, Failed, Repairing, or Inaccessible data states do not apply.
- One or more redundancy groups are rebuilding (that is, there is a DDM with a rebuilding state in the array).

#### **Read Only**

The array is in the Read-only data state if all of the following conditions exist:

- The Failed, Repairing, and Inaccessible data states do not apply.
- One or more DDMs have failed.

- There are insufficient spares to support all rebuild operations.
- Continued write operation without redundancy could result in data loss.

#### **Failed**

The array is in the Failed data state if all of the following conditions exist:

- The Repairing and Inaccessible data states do not apply.
- Two or more DDMs in the array have failed.
- There are insufficient DDMs left in the array to rebuild the data that was lost on the failing storage devices.

#### **Repairing**

The array is in the Repairing data state if all of the following conditions exist:

- The Inaccessible data state does not apply.
- The array has previously entered the failed state.
- The repair array function has been accepted.
- The repair array function has not completed.

#### **Inaccessible**

The array is in the Inaccessible data state if the storage unit cannot access a set of storage devices that are sufficient to access all the data on the array.

#### **RaidType**

Specifies the type of RAID array (5 or 10) and the array configuration (for example, 6+P).

**Arsite** Specifies the array sites that are associated with the array.

**Rank** Specifies the rank that the array is assigned to. The value is displayed as a combination of a storage image ID and a rank number. The rank number is the prefix *R*, followed by a four-digit decimal number, with no leading zeros (for example, R26).

**Note:** If the array is unassigned, the field is null (–)

#### **DA pair**

Specifies the DA pair ID. DA pairs are located in I/O enclosure pairs. The DA pair ID indicates the location of the I/O enclosure.

**Note:** DA adapters are installed in slot 3 an enclosure and slot 6 in the peer enclosure. The DA pair ID identifies the enclosure that contains the DA adapter in slot 3. For example, a DA adapter is installed in slot of 3 of enclosure 2. Its peer is installed in slot 6 of enclosure 3. In this case, the DA Pair ID is 2.

#### **DDMcap (10^9B)**

Specifies the minimum disk capacity (10^9B) of the storage devices (DDMs) in the designated array.

#### **DDMRPM**

Specifies the minimum disk rpm of the DDMs in the designated array.

#### **Interface Type**

Specifies the disk interface type of the DDMs in the designated array

### Interrate

Specifies the minimum disk interface rate of the disks in the designated array.

### Disk class

Specifies the disk class as either high speed fibre-channel disk drives or near-line disk drives. The displayed value is one of the following:

**ENT** Specifies enterprise and represents high speed fibre-channel disk drives

**NL** Specifies near-line and represents ATA (FATA) disk drives

## Rank specific commands

This section contains commands that are used to create, modify, and delete ranks and to display rank information.

Use the following commands to create, modify, and delete ranks and to display rank information:

- **chrank**
- **lsrank**
- **mkrank**
- **rmrank**
- **showrank**

The **chrank** command assigns an unassigned rank to an extent pool or removes an assigned rank from a extent pool. This command can also be used to change an assigned rank to an unassigned rank.

The **lsrank** command generates a report that displays a list of defined ranks in a storage unit and the status information for each rank in the list.

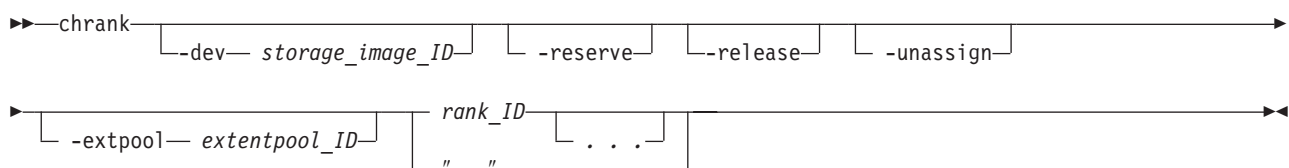
The **mkrank** command creates one fixed block or count key data (CKD) rank from one array.

The **rmrank** command deletes the specified ranks from a storage unit.

The **showrank** command generates two types of reports. One report displays the detailed properties of a specified rank. The other report displays the performance metrics of a specified rank.

### chrank

The **chrank** command assigns an unassigned rank to an extent pool, or removes an assigned rank from a extent pool. This command can also be used to change an assigned rank to an unassigned rank.



## Parameters

### **-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for all ranks; otherwise, it is optional.

Example: IBM.1750-68FA120

### **-reserve**

(Optional) Specifies that the rank configuration state be set to Reserved.

### **-release**

(Optional) Specifies that the rank configuration state be set to Normal.

### **-unassign**

(Optional) Specifies that the rank configuration state be set to Unassigned.

### **-extpool** *extentpool\_ID*

(Optional) Assigns the rank to an extent pool. Accepts either a fully qualified extent pool ID including storage image ID or a shortened version if the **-dev** parameter is used. The shortened version is a four-digit decimal number with no leading zeroes, prefixed with the letter P.

### *rank\_ID* . . . | -

(Required) Specifies one or more ranks to be modified. Accepts either a fully qualified rank ID, or a rank number if the **-dev** parameter is used. A rank number is a four-digit decimal number with no leading zeroes, prefixed by the letter R.

To specify a range of rank IDs, separate the rank IDs with a hyphen.

You must separate multiple rank IDs or ranges of rank IDs with a blank space between each ID or range of IDs.

Example: IBM.1750-68FA120/R2

If you use the dash (-), the specified value is read from standard input.

## Example (1750)

### Invoking the **chrnk** command

```
dscli>chrnk -dev IBM.1750-68FA120 -extpool P101 R2
```

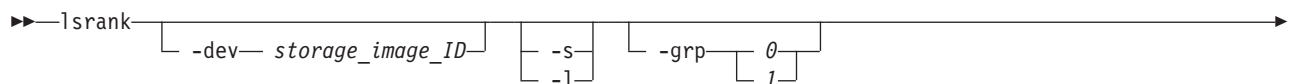
### The resulting output

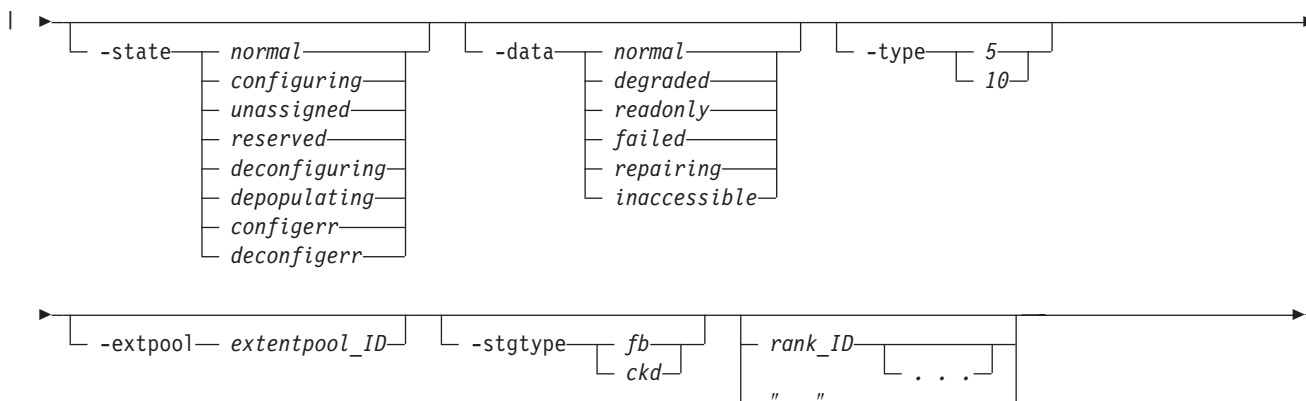
```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

```
Rank IBM.1750-68FA120/R2 successfully modified.
```

## **lsrank**

The **lsrank** command displays a list of defined ranks in a storage image and status information for each rank.





## Parameters

```
-dev storage_image_ID
```

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number.

Example: IBM.1750-68FA120

- s (Optional) Displays the rank ID. You cannot use the -l and the -s parameters together.

- l (Optional) Displays the default output, extent pool name, number of extents, and extents that are used for each rank. You cannot use the -l and the -s parameters together.

```
-grp 0 | 1
```

(Optional) Displays only the ranks that belong to the specified rank group. A rank in the unassigned state is not associated with a rank group.

**-state** *normal* | *configuring* | *unassigned* | *reserved* | *deconfiguring* | *depopulating* | *configerr* | *deconfigerr*

(Optional) Displays only ranks in the specified state.

**-data** *normal* | *degraded* | *readonly* | *failed* | *repairing* | *inaccessible*

(Optional) Displays only ranks in the specified data state.

```
-type 5 | 10
```

(Optional) Displays only ranks of the specified RAID type.

**-extpool** *extentpool\_ID*

(Optional) Displays only ranks in the specified extent pool. An extent pool ID is a four-digit decimal number with no leading zeroes, prefixed with the letter P.

```
-stgtype fb | ckd
```

(Optional) Displays only ranks that are configured for the specified storage type.

 $rank\_ID \dots | -$ 

(Optional) Displays rank information for specified rank IDs. An ID range is defined by two IDs that are separated by a hyphen.

You must separate multiple rank IDs or ranges of rank IDs with a blank space between each ID or range of IDs.

If you use the dash (-), the specified value is read from standard input.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **lsrank** command using the **-l** parameter. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750.

### Invoking the lsrank command

```
dsccli>lsrank -dev IBM.2107-75FA120 -l
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

| ID                  | Group | State  | Datastate | Array | RAIDtype |
|---------------------|-------|--------|-----------|-------|----------|
| IBM.2107-75FA120/R1 | 0     | Normal | Normal    | A1    | 5        |
| IBM.2107-75FA120/R2 | 0     | Normal | Normal    | A2    | 5        |
| IBM.2107-75FA120/R3 | 0     | Normal | Normal    | A3    | 5        |
| IBM.2107-75FA120/R4 | 0     | Normal | Normal    | A4    | 5        |

| ExtentpoolID | Extpoolnam     | Stgtype | Exts  | Usedexts |
|--------------|----------------|---------|-------|----------|
| P1           | host_1_volumes | fb      | 1,000 | 500      |
| P1           | host_1_volumes | fb      | 1,000 | 500      |
| P1           | host_1_volumes | fb      | 1,000 | 500      |
| P1           | host_1_volumes | fb      | 1,000 | 500      |

### Report field definitions

**ID** Specifies the unique identifier assigned to the rank.

**Group** Specifies the rank group that the rank is assigned to. A value of 0, 1, or - (null) is displayed. If a rank is unassigned the value displayed is - (null).

**State** Specifies the current configuration state of this rank ID. One of the following values is displayed:

#### Normal

Specifies that rank is assigned to an extent pool ID and none of the other state conditions apply.

#### Configuring

Specifies that the rank is in the process of being initially configured.

#### Unassigned

Specifies that the rank is not assigned to a extent pool ID.

**Reserved**

Specifies that the rank extents are not eligible for volume assignment.

**Deconfiguring**

Specifies that the rank is in the process of being deleted.

**Depopulating**

Specifies that the extents on a rank are not eligible for allocation and the existing allocations are to be moved to another rank in the extent pool using dynamic extent relocation.

**Configuration Error**

Specifies that a rank configuration process failed to complete successfully. This state reflects an internal error condition and not an error in the user's request to create the rank. To correct this state, you must delete the designated rank configuration.

**Deconfiguration Error**

Specifies that a rank removal process has failed to complete successfully. This state reflects an internal error condition and not an error in the request to remove the rank. To correct this state, you must reissue the **rmrank** command for the designated rank configuration.

**Datastate**

**Note:** A rank is not considered for new extent allocations if it is not in the normal or degraded data state (even if the configuration state is normal).

Datastate specifies the current state of the data extents contained by the designated rank ID. One of the following values is displayed:

**Normal**

A rank is in the normal data state when the configuration state is one of the following: unassigned, configuring, or configuration error.

**Degraded**

A rank is in the degraded data state if one or more arrays in the rank are in the degraded data state and none are in the read only, failed, repairing, or inaccessible data states.

**Read only**

A rank is in the read only data state if one or more arrays in the rank are in the read only data state and none are in the failed, repairing, or inaccessible data states.

**Failed** The rank is in the failed data state if one or more arrays in the rank are in the failed data state.

**Repairing**

A rank is in the repairing data state if one or more arrays in the rank are in the repairing data state and none are in the failed data state.

**Inaccessible**

A rank is in the inaccessible data state if one or more arrays in the rank are in the inaccessible data state and none are in the failed or repairing data states.



**Array** Specifies the array ID that is assigned to the designated rank.

**RAIDtype**

Specifies the RAID type of the array associated with this rank. The value displayed is either 5 or 10.

**ExtentpoolID**

Specifies the extent pool to which the rank is assigned.

**Extpoolnam**

Specifies the name that is assigned to the extent pool to which the rank is assigned.

**Stgtype**

Specifies the storage type of the extent pool to which the rank is assigned. The value displayed is either fb (fixed block) or ckd (count key data)

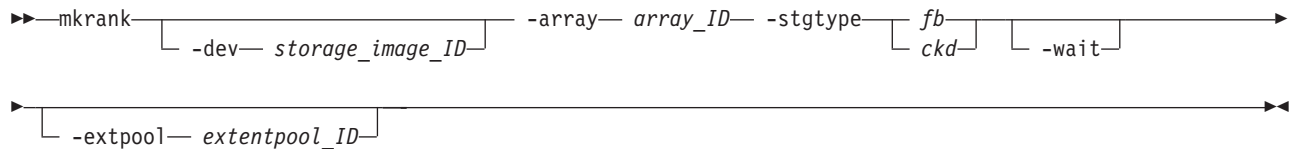
**Exts** Specifies the number of extents that are contained in the designated rank. The value displayed is a number in the range of 1 - 4000.

**Usedexts**

Specifies the number of extents that are allocated to volumes from the designated rank. The value displayed is a number in the range of 1 - 4000.

**mkrank**

The **mkrank** command creates one fixed block or count key data (CKD) rank from one array.



**Parameters**

**Note:** It is recommended that you specify either the **-wait** or the **-extpool** parameter when using the **mkrank** command. Using either of these parameters allows you to be notified if the rank configuration has failed for any reason.

**-dev storage\_image\_ID**

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the extent pool and you do not specify a value for the *devid* variable in your profile file.

**-array array\_ID**

(Required) Specifies the ID of the array from which the rank is to be created. An array ID is a four digit decimal number with no leading zeroes, prefixed with the letter A.

**-stgtype fb | ckd**

(Required) Specifies the type of extent for which the rank will be configured, either fixed block or count key data.

**-wait**

(Optional) Delays the command response until the rank configuration process completes.

**-extpool** *extentpool\_ID*

(Optional) Specifies the extent pool that contains the created rank extents. If an extent pool is specified, then the rank will be assigned to the extent pool. Otherwise, the rank state is unassigned. If specified, the extent pool must exist and must be compatible with the specified **-stgtype** parameter option. An extent pool ID is a four-digit decimal number with no leading zeroes, prefixed with the letter *P*.

**Note:** You must use the **chrank** command if you choose to specify the extent pool ID at a later time.

## Example (1750)

### Invoking the mkrank command

```
dscli>mkrank -dev IBM.1750-68FA120 -array A44 -stgtype fb -wait
```

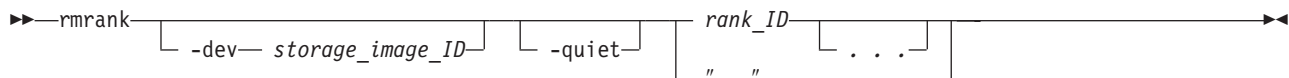
### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Device: IBM.1750-68FA120
```

```
Rank IBM.1750-68FA120/R44 successfully created.
```

### rmrank

The **rmrank** command deletes ranks from a storage image. This command is rejected if any volume extents in the rank are being used. In addition, this command formats the drives (DDMs). Until the formatting is done, the associated array cannot be removed.



### Parameters

**Note:** The processing time that is associated with this command can be lengthy and might inhibit your use of the array on which this command is being processed.

When the **rmrank** command is issued, the following processing occurs:

- The rank is unassigned from the array.
- The rank is removed. When this is successful a message is displayed. This piece of the process does not take long; however, the processing that is associated with this command is not complete even though you have received a message that the rank was removed.
- The array is formatted. This processing can take some time. During this processing the array cannot be removed or assigned to another rank. Also, until this process is fully completed, the array is listed as assigned to the rank from which it has been removed.
- You can check the progress of the **rmrank** command by logging onto another session of DS CLI. Issue the **lsarray** command against the storage unit where the rank or ranks are being deleted. When you no longer see the array that is assigned to the rank from which you removed it, the remove rank process is complete.

The following list defines the parameters that are associated with the **rmrank** command:

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for all ranks; otherwise, it is optional.

**-quiet**

(Optional) Turns off the confirmation prompt for this command.

*rank\_ID* . . . | -

(Required) Specifies an array of one or more ranks to be deleted. This parameter accepts a fully qualified rank ID, which includes the storage image ID, or a shortened version without the storage image ID if the **-dev** parameter is specified. The shortened version is a four-digit decimal number with no leading zeroes, prefixed with the letter *R*.

To specify a range of rank IDs, separate the rank IDs with a hyphen.

You must separate multiple rank IDs or ranges of rank IDs with a space between each ID or range of IDs.

If you use the dash (-), the specified value is read from standard input.

## Example (1750)

### Invoking the **rmrank** command

```
dscli>rmrank -dev IBM.1750-68FA120 R23
```

### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

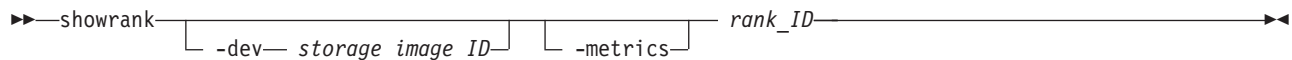
```
Are you sure you want to delete rank R23? [y/n]: Y
```

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

```
Rank R23 successfully deleted.
```

### **showrank**

The **showrank** command displays detailed properties or performance metrics of a rank.



## Parameters

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the rank; otherwise, it is optional.

**-metrics**

(Optional) Displays the rank ID and performance statistics for the specified rank.

**Note:** All performance statistics are an accumulation since the most recent counter wrap or counter reset. Rank performance counters are reset on a power up sequence or by a server failover and failback sequence.

*rank\_ID*

(Required) Specifies the properties for the specified rank. This parameter accepts a fully qualified rank ID, which consists of the storage image ID, or a shortened version without the storage image ID if the **-dev** parameter is specified. The shortened version is a four-digit decimal number with no leading zeros, prefixed by the letter *R*.

## Example

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output reports that are associated with the **showrank** command. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750.

### Invoking the showrank command to show rank properties

```
dsccli>showrank -dev IBM.2107-75FA120 R34
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-75FA120

| ID                       | SN     | Group | State  | Datastate | Array                        | RAIDtype |
|--------------------------|--------|-------|--------|-----------|------------------------------|----------|
| 1750<br>-75FA120<br>/R34 | A23567 | 0     | Normal | Normal    | IBM.1750<br>-75FA120<br>/A44 | 10       |

| ExtpoolID                    | Extpoolnam         | Volumes                     | Stgtype | Exts  | Usedexts |
|------------------------------|--------------------|-----------------------------|---------|-------|----------|
| IBM.1750<br>-75FA120<br>/P48 | host_4<br>_extpool | IBM.1750<br>-75FA120<br>/R7 | FB      | 1,000 | 500      |

| Widearrays | Nararrays | Trksize | Strpsize | Strpesize | Extsize |
|------------|-----------|---------|----------|-----------|---------|
| 1          | 0         | 128     | 4        | 4         | 16,384  |

### Report field definitions (-metrics parameter not specified)

**ID** Specifies the unique ID that is assigned by the system to the rank. The ID includes the storage image ID and the rank ID.

**SN** Specifies the unique serial number that is assigned to the designated rank ID.

**Group** Specifies the rank group that the rank is assigned to. One of the following values are displayed: 0, 1, - (null).

**Note:** Null (-) is displayed if the rank has not been assigned to an extent pool.

**State** Specifies the configuration state that is associated with the rank at the time that the report is generated. The following values can be displayed for the rank:

**Normal**

Specifies that a rank is assigned to an extent pool ID and none of the other state conditions apply.

**Configuring**

Specifies that a rank is in the process of being initially configured. Generally this state indicates that the associated rank transaction has not completed.

**Unassigned**

Specifies that a rank is not assigned to an extent pool ID.

**Reserved**

Specifies that rank extents are not eligible for volume allocation.

**Deconfiguring**

Specifies that a rank is in the process of being deleted.

**Configuration Error**

Specifies that a rank configuration process did not complete successfully. This state indicates that there is an internal error condition and it is not an indication that there was a user input error.

**Deconfiguration Error**

Specifies that a rank removal process did not complete successfully. This state indicates that there is an internal error condition and it is not an indication that there was a user input error. This configuration state is corrected by reissuing the **rmrank** command.

**Datstate**

Specifies the current state of the data extents that are contained by this rank ID. The following values can be displayed for the rank:

**Normal**

Specifies that none of the other data states apply.

**Degraded**

Specifies that one or more arrays in the rank are in the degraded state.

**Read Only**

Specifies that one or more arrays in the rank are in the Read Only state.

**Failed** Specifies that one or more arrays in the rank are in the Failed state.

**Repairing**

Specifies that one or more arrays in the rank are in the Repairing state.

**Inaccessible**

Specifies that one or more arrays in the rank are in the Inaccessible state.

**Array** Specifies the array ID that is assigned to the designated rank.

**RAIDtype**

Specifies the RAID type of the array that is associated with the designated rank.

**ExtpoolID**

Specifies the extent pool to which the designated rank is assigned.

**Extpoolnam**

Specifies the extent pool to which the designated rank is assigned.

**Volumes**

Specifies the volume IDs that have an extent pool value that is allocated on the designated rank.

**Stgtype**

Specifies the storage type of the extent pool the designated rank is assigned to. Valid values are fixed block and count key data (CKD).

**Exts**

Specifies the number of extents that are contained in the designated rank. 1 - 4000 are valid values.

**Usedexts**

Specifies the number of extents that are allocated to volumes from the designated rank.

**Widearrays**

Specifies the number of wide arrays that are contained by the designated rank. 0 or 1 are valid values.

**Nararrays**

Specifies the number of narrow arrays that are contained by the designated rank.

**Trksize**

Specifies the track size.

**Notes:**

1. The track size is displayed as a 1 if it is associated with a CKD storage type.
2. The track size is displayed as 128 if it is associated with a fixed block storage type.

**Strpsize**

Specifies the number of logical tracks in a strip on the designated rank.

**Strpessize**

Specifies the number of logical tracks in a stripe on the designated rank.

**Extsize**

Specifies the number of logical tracks in a extent on the designated rank.

**Notes:**

1. A CKD 1 GB extent contains 16 696 tracks.
2. A fixed block 1 GB extent contains 16 384 tracks.

**Performance request**

**Invoking the showrank command to show performance metrics**

```
dscli>showrank -dev IBM.2107-75FA120 -metrics R34
```

**The resulting output**

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
```

| ID                       | Date                 | Byteread | Bytewrit | Reads |
|--------------------------|----------------------|----------|----------|-------|
| 1750<br>-75FA120<br>/R34 | 10/11/04<br>02:23:47 | 10000    | 10000    | 10000 |

| Writes | Timeread | Timewrite |
|--------|----------|-----------|
| 10000  | 10000    | 10000     |

### Report field definitions (with the -metrics parameter specified)

**ID** Specifies the unique ID that is assigned by the system to the rank. The ID includes the storage image ID and the rank ID.

**Date** Specifies the time stamp for the rank performance counters.

**Byteread**  
Specifies the number of rank bytes that are read in 128 KB increments.

**Bytewrit**  
Specifies the number of rank bytes that are written in 128 KB increments.

**Reads** Specifies the rank read operations.

**Writes** Specifies the rank write operations.

**Timeread**  
Specifies the rank read response time in 16 millisecond increments.

**Timewrite**  
Specifies the rank read response time in 16 millisecond increments.

## Extent pool specific commands

This section contains commands that are used to create, modify, and delete extent pools and to display extent pool information.

Use the following commands to create, modify, and delete extent pools and to display extent pool information:

- **chextpool**
- **lsextpool**
- **mkextpool**
- **rmextpool**
- **showextpool**

The **chextpool** command modifies an extent pool.

The **lsextpool** command generates a report that displays a list of the extent pools in a storage unit and the status information on each extent pool in the list.

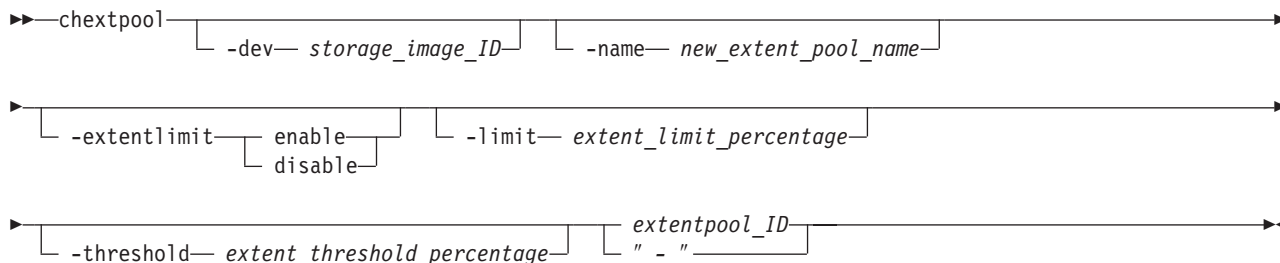
The **mkextpool** command creates a fixed block or count key data (CKD) storage type extent pool.

The **rmextpool** command deletes one or more specified extent pools from a storage unit.

The **showextpool** command generates two types of reports. One of the reports displays the detailed properties of a specified extent pool. The other report displays the performance metrics for the specified extent pool.

## chextpool

The **chextpool** command modifies attributes that are associated with an extent pool.



## Parameters

**Note:** The **-virextentlimit**, **-virlimit**, and **-virthreshold** parameters are used only on DS8000 models.

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which consists of a value for manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for the extent pool; otherwise, it is optional.

**-name** *new\_extent\_pool\_name*

(Optional) Specifies a new name for the extent pool.

**-extentlimit** *enable | disable*

(Optional) Specifies that the extent limit function be enabled or disabled.

**-limit** *extent\_limit\_percentage*

(Optional) Specifies the maximum value of the percentage of allocated real extents that are allowed in this extent pool.

**-threshold** *extent\_threshold\_percentage*

(Optional) Specifies threshold as a percentage of the available real extents that is compared to the actual percentage of available real extents. The system issues a warning when this percentage is exceeded.

*extentpool\_ID* | -

(Required) Specifies the ID of the extent pool to be changed. This parameter accepts either a fully qualified extent pool ID or a shortened version if the **-dev** parameter is used. The shortened version is a four-digit decimal number with no leading zeros, prefixed with the letter *P*.

If you use the dash (-), the specified value is read from standard input.

**Note:** You cannot use the dash (-) while you are in the DS CLI interactive command mode.

## Example (1750)

### Invoking the chextpool command

```
dsccli>chextpool -name host_4_extpool IBM.1750-68FA120/P21
```



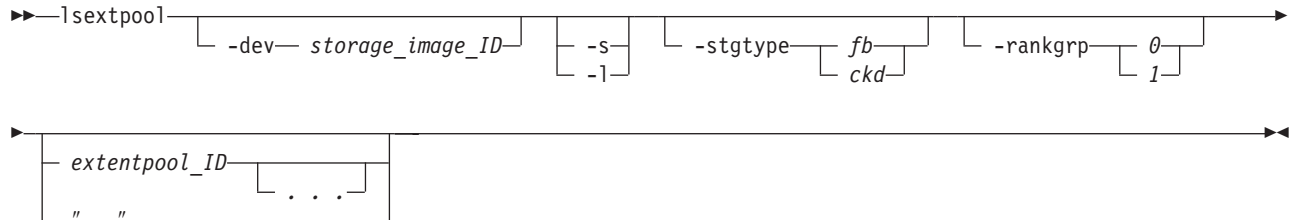
## The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120

Extent Pool IBM.1750-68FA120/P21 successfully modified.

## lsxtpool

The **lsxtpool** command displays a list of extent pools in a storage unit and status information on each extent pool in the list.



## Parameters

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number.

**-s** (Optional) Displays extent pool IDs. You cannot use the **-l** and the **-s** parameters together.

**-l** (Optional) Displays default output plus additional attributes that are identified as long output. You cannot use the **-l** and the **-s** parameters together.

**-stgtype** *fb* | *ckd*

(Optional) Displays only extent pools with the specified storage type.

**-rankgrp** *0* | *1*

(Optional) Displays only extent pools in the specified rank group.

*extentpool\_ID* . . . | -

(Optional) Displays only the extent pools with the specified IDs. An extent pool ID is a four-digit decimal number with no leading zeroes, prefixed by the letter *P*.

To specify a range of extent pool IDs, separate the extent pool IDs with a hyphen.

You must separate multiple extent pool IDs or ranges of extent pool IDs with a space between each ID or range of IDs.

If you use the dash (-), the specified value is read from standard input. You cannot use the dash (-) while you are in the DS CLI interactive command mode.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **lsxtpool** command using the **-l** parameter.

## Invoking the lsxtpool command

```
dscli>lsextpool -dev IBM.2107-75FA120 -1
```

### The resulting output

Date/Time: October 10, 2007 09:38:37 MST 2004 IBM DS CLI Version: 5.3.0.832  
DS: IBM.2107-1300321

| Name                      | ID                          | Stgtype | Rankgrp | Status | Avail-<br>stor<br>(2^30B) |
|---------------------------|-----------------------------|---------|---------|--------|---------------------------|
| ckd_c0<br>_ext<br>_pool00 | IBM.2107-<br>1300321<br>/P0 | ckd     | 0       | below  | 600                       |
| ckd_c1<br>_ext<br>_pool01 | IBM.2107-<br>1300321<br>/P1 | ckd     | 1       | below  | 600                       |
| fb_c0<br>_ext<br>_pool02  | IBM.2107-<br>1300321<br>/P2 | fb      | 0       | below  | 715                       |
| fb_c1<br>_ext<br>_pool03  | IBM.2107-<br>1300321<br>/P3 | fb      | 1       | below  | 715                       |

| %allo-<br>cated | Avail-<br>able | Reser-<br>ved | Num-<br>vols | Num-<br>ranks |
|-----------------|----------------|---------------|--------------|---------------|
| 21              | 681            | 0             | 64           | 1             |
| 21              | 681            | 0             | 64           | 1             |
| 8               | 715            | 0             | 64           | 1             |
| 8               | 715            | 0             | 64           | 1             |

### Report field definitions

**Name** Identifies the name you assigned to the extent pool.

**ID** Specifies the system assigned unique identifier for the extent pool object.

#### stgtype

Identifies the storage type associated with the extent pool. One of the following is displayed:

- fb
- ckd

#### rankgrp

Specifies the rank group in which the designated extent pool is configured.

**Status** Specifies the extent status. One of the following values is displayed:

#### exceeded

Specifies that the percent of real extents available is less than the real extent threshold.

#### below

Specifies that the percent of real extents available is greater than the real extent threshold.

#### full

Specifies that the %Extents Available is 0.

**availstor (2^30 Bytes)**

Specifies the available storage for the designated extent pool, in gigabytes (2 ^ 30 Bytes).

**%allocated**

Specifies the percentage of real extents allocated.

**available**

Specifies the maximum number of real extents available for allocation in the designated extent pool.

**reserved**

Specifies the real extents reserved in the designated extent pool.

**numvols**

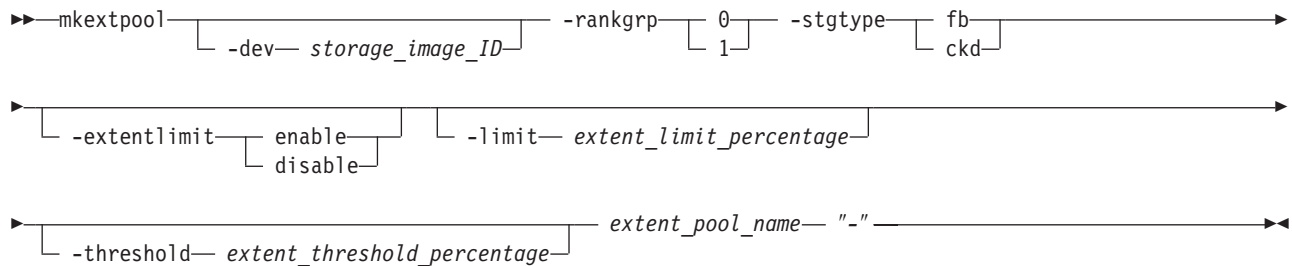
Identifies the number of logical volumes that have been configured from the designated extent pool.

**numranks**

Identifies the number of ranks that have been configured in the designated extent pool.

**mkextpool**

The **mkextpool** command creates a fixed block or count key data (CKD) storage type extent pool.

**Parameters****Notes:**

1. An extent pool object is assigned to either rank group 0 or 1, which allows the extent pool to be managed by storage unit server 0 or 1 respectively.
2. Create extent pool objects before creating array and rank objects.
3. Create extent pools of a given type for both rank groups 0 and 1 so that volumes that are assigned to a volume group can be spread across both rank groups 0 and 1.

**-dev storage\_image\_ID**

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number.

**-rankgrp 0 | 1**

(Required) Assigns the extent pool to either rank group 0 or 1. Rank group 0 is managed by server 0, and rank group 1 is managed by server 1.

**Note:** If an extent pool does not exist, you can issue the **chrank** command after an extent pool is created in order to assign the rank to the extent pool. In addition, you can create extent pools of a given type for both

rank groups 0 and 1 so that volumes that are assigned to a volume group might be spread across both rank groups 0 and 1.

**-stgtype fb | ckd**

(Required) Specifies the volume storage type that is contained by this extent pool.

**-extentlimit enable | disable**

(Optional) Specifies that the extent limit function is enabled or disabled. The default is disable.

**-limit extent\_limit\_percentage**

(Optional) Specifies the maximum value of the percentage of allocated real extents that are allowed in this extent pool. This value defaults to 100 if not specified.

**-threshold extent\_threshold\_percentage**

(Optional) Specifies the minimum threshold percentage of the real extents available. When the percentage of the currently available real extents is less than this minimum percentage, notifications are sent and the real extent status is reported as exceeded.

**extent\_pool\_name | -**

(Required) Specifies your extent pool name, which is limited to 16 characters.

If you use the dash (-), the specified value is read from standard input.

**Note:** You cannot use the dash (-) while you are in the DS CLI interactive command mode.

## Example (1750)

### Invoking the mkextpool command

```
dscli>mkextpool -dev IBM.1750-68FA120 -rankgrp 0 -stgtype fb my_extpool
```

### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

```
Extent pool P2 successfully created.
```

## rmextpool

The **rmextpool** command deletes extent pools from a storage image.

```

>>rmextpool -dev storage_image_ID -quiet extentpool_ID . . .

```

## Parameters

**-dev storage\_image\_ID**

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for all extent pools; otherwise, it is optional.

**-quiet**

(Optional) Turns off the confirmation prompt for this command.

**extentpool\_ID . . . | -**

(Required) Specifies the IDs of one or more extent pools to be deleted. A fully qualified extent pool ID is accepted, which consists of the storage image ID, or

1

To specify a range of extent pool IDs, separate the extent pool IDs with a hyphen.

If you use the dash (-), the specified value is read from standard input.

leading zeroes, prefixed with the letter *P*. Even numbered extent pools are associated with rank group 0. Odd numbered extent pools are associated with rank group 1.

If you use the dash (-), the specified value is read from standard input.

**Note:** You cannot use the dash (-) while you are in the DS CLI interactive command mode.

## Example

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output reports that are associated with the **showextpool** command. The headers are the same for the DS8000 model and DS6000 model. However, not all values (such as virtual values) are displayed for the DS6000.

### Invoking the showextpool command to show extent pool properties

```
dscli>showextpool -dev IBM.2107-75FA120 P101
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

| Name           | ID                   | stgtype | totlstor<br>(2^30B) | availstor<br>(2^30B) | resvdstor<br>(2^30B) | rankgrp |
|----------------|----------------------|---------|---------------------|----------------------|----------------------|---------|
| host_4_extpool | IBM.2107-75FA120/P21 | fb      | 1000                | 800                  | 0                    | 1       |

| num ranks | numvols | status   | %allo-<br>cated | %avail-<br>able | config-<br>ured | allowed | avail-<br>able |
|-----------|---------|----------|-----------------|-----------------|-----------------|---------|----------------|
| 4         | 3       | exceeded | 20              | 80              | 1000            | 600     | 800            |

| allocated | reserved | %limit | %thres-<br>hold |
|-----------|----------|--------|-----------------|
| 200       | 0        | 80     | 30              |

### Report field definitions

**Name** Identifies the name you assigned to the extent pool.

**ID** Specifies the system assigned unique identifier for the extent pool object.

#### stgtype

Identifies the storage type associated with the extent pool. One of the following is displayed:

- fb
- ckd

#### totlstor (2^30 Bytes)

Specifies the amount of storage associated with the extent pool in GB.

#### availstor (2^30 Bytes)

Specifies the available storage for the designated extent pool in GB.

**resvdstor (2^30 Bytes)**

Specifies the amount of reserved storage for the designated extent pool in GB.

**rankgrp**

Specifies the rank group in which the designated extent pool is configured.

**numranks**

Specifies the number of ranks configured in the designated extent pool.

**numvols**

Identifies the number of logical volumes that have been configured from the designated extent pool.

**status** Specifies the extent status. One of the following values is displayed:

**exceeded**

Specifies that the percent of real extents available is less than the real extent threshold

**below**

Specifies that the percent of real extents available is greater than the real extent threshold.

**full**

Specifies that the %Extents available is zero.

**%allocated**

Specifies the percentage of extents allocated. A value of 1 - 100 is displayed.

**%available**

Specifies the percentage of extents that are available. A value of 1 - 100 is displayed.

**configured**

Specifies the number of extents that are contained in the extent pool.

**allowed**

Specifies the number of extents that are below the applicable extent limit.

**available**

The number of real extents of a given type that are available for allocation to a logical volume.

**allocated**

Specifies the number of extents of a given type in the extent pool that are allocated to logical volumes or auxiliary volumes.

**%limit**

Specifies the maximum percentage of allocated real extents that are allowed in this extent pool.

**%threshold**

Specifies the minimum threshold percentage of the real extents available. When the percentage of the currently available real extents is less than this minimum percentage, notifications are sent and the extent status is reported as exceeded.

**Performance request****Invoking the showextpool command to show performance metrics**

```
dsccli>showextpool
-metrics IBM.2107-75FA120/P101
```

**The resulting output**

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

| ID                    | Date                 | real<br>extcap | realext | real<br>allocext | real<br>extconv |
|-----------------------|----------------------|----------------|---------|------------------|-----------------|
| IBM.2107-75FA120/P101 | 10/11/04<br>02:23:47 | 10000          | 10000   | 10000            | 10000           |

| dyreloc<br>source | dyreloc<br>target |
|-------------------|-------------------|
| 10000             | 10000             |

**Report field definitions**

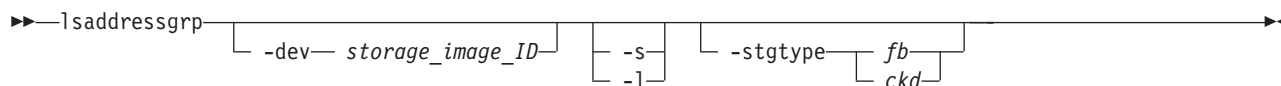
- ID** Specifies the system assigned unique identifier for the extent pool object.
- Date** Identifies the current time stamp for the extent pool performance counters.
- realextcap** Specifies the real extent pool capacity in GB.
- realext** Specifies the number of real extents in the extent pool.
- realallocext** Specifies the number of real allocated extents in the extent pool.
- realextconv** Specifies real extent conversions.
- dyrelocsource** Specifies the number of extents that were sources of a dynamic extent relocation.
- dyreloctarget** Specifies the number of extents that were targets of a dynamic extent relocation.

**Address group specific commands**

This section contains commands that are used to display address group information.

- | Use the **lsaddressgrp** command to display address group information.
  - |
  - | The **lsaddressgrp** command generates a report that displays a list of address groups for a storage unit and the status information for each address group in the list.
  - |
- lsaddressgrp**
- The **lsaddressgrp** command displays a list of address groups for a storage image and the status information for each address group in the list.





## Parameters

**-dev** *storage\_image\_ID*

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number. Displays only the objects for the storage unit specified.

Example: IBM.1750-68FA120

**-s** (Optional). Displays the address group IDs only. You cannot use the **-l** and the **-s** parameters together.

**-l** (Optional). Displays the default output. You cannot use the **-l** and the **-s** parameters together.

**-stgtype** *fb | ckd*

(Optional). Displays only the address groups that are associated with the specified storage type.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following table represents the headers that are displayed on the output report that is associated with the **lsaddressgrp** command using the **-l** parameter. A separate example is not shown for the 1750 as the information is the same for both the 2107 and 1750.

### Invoking the lsaddressgrp command

```
dsccli>lsaddressgrp -dev IBM.2107-75FA120 -l
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

| ID                 | Stgtype | Basevolnum | Vols | LSSs | Confgvols |
|--------------------|---------|------------|------|------|-----------|
| IBM.2107-75FA120/0 | fb      | 0000       | 4096 | 16   | 164096    |
| IBM.2107-75FA120/1 | fb      | 0100       | 4096 | 16   | 164096    |
| IBM.2107-75FA120/2 | ckd     | 0200       | 4096 | 16   | 164096    |
| IBM.2107-75FA120/3 | ckd     | 0300       | 4096 | 16   | 164096    |

**Report field descriptions**

- ID** Specifies the storage image address group unique identifier. The address number is a single hexadecimal character (0 - 9 or uppercase A - F).
- Stgtype** Specifies the type of logical devices that are configured for the specified address group: fb - fixed block and ckd - count key data.
- Basevolnum** Specifies the lowest logical volume number in the address group.
- Vols** Specifies the number of logical volume numbers that are associated with the address group
- LSSs** Specifies the number of logical subsystems (LSSs) that are configured on the address group.
- Confgvols** Specifies the number of logical volumes that are configured on the address group.

**Logical control unit specific commands**

This section contains commands that are used to create, modify, and delete logical control units for zSeries systems and to display logical control unit information.

Use the following commands to create, modify, and delete logical control units and to display logical control unit information:

- **chlcu**
- **lslcu**
- **mklcu**
- **rmlcu**
- **showlcu**

The **chlcu** command modifies a logical control unit.

The **lslcu** command generates a report that displays a list of logical control units for a storage unit and the status information for each logical control unit in the list.

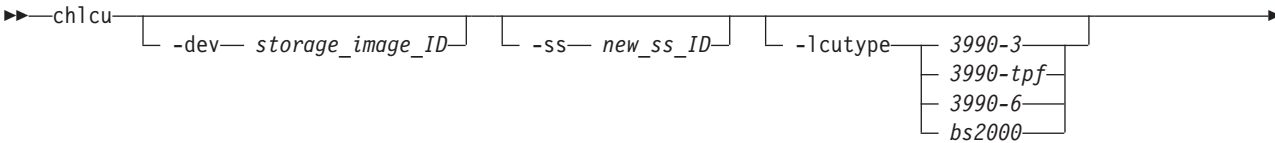
The **mklcu** command creates a logical control unit in a storage unit. A logical control unit is configured to represent a grouping of logical CKD volumes.

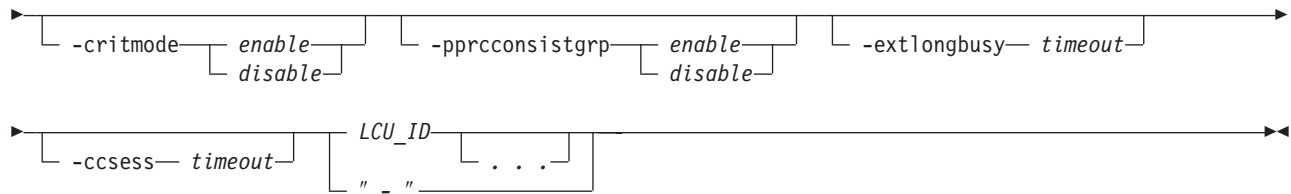
The **rmlcu** command deletes one or more specified logical control units.

The **showlcu** command generates a report that displays the detailed properties for the specified logical control unit.

**chlcu**

The **chlcu** command modifies a logical control unit.





## Parameters

**-dev** *storage\_image\_ID*

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number.

Example: IBM.1750-68FA120

**-ss** *new\_ss\_ID*

(Optional). Specifies your new LCU subsystem ID value (valid range is hexadecimal 0x0001 - 0xFFFF). If this parameter is specified, multiple LCUs are not allowed. The new SSID that you specify replaces the existing SSID value in the initial target LCU ID.

Example: F010

**-lcutype** *3990-3 | 3990-tpf | 3990-6 | bs2000*

(Optional). Changes the target LCUs to the new LCU type:

**3990-3** TYPE\_3990\_MODEL\_3

**3990-tpf**  
TYPE\_3990\_MODEL\_3\_for\_TPF

**3990-6** TYPE\_3990\_MODEL\_6

**BS2000**  
TYPE\_BS\_2000

**-critmode** *enable | disable*

(Restricted). Specifies that the critical heavy mode setting in the target LCUs be enabled or disabled. Critical heavy mode controls the behavior of the remote mirror and copy (formerly PPRC) pairs that have a primary logical volume on this LCU and are in an LCU consistency group. See the **mkpprc** command for additional information.

You must have administrator privileges to specify this option.

**-pprconsistgrp** *enable | disable*

(Optional). Specifies that the remote mirror and copy consistency group state setting be enabled or disabled. Any volume that becomes suspended that is associated with the subsystem LSS passes into an extended Long Busy state unless a created consistency group has been received. Otherwise, the volume does not become long busy.

**-extlongbusy** *timeout*

(Optional). Specifies the time in seconds that an LCU consistency group volume stays long busy after reporting an error that causes a remote mirror and copy (formerly PPRC) suspension if a consistency group has not been created.

**-ccsess** *timeout*

(Optional). Specifies the concurrent copy session timeout in seconds setting.

This value indicates how long (in seconds) any LCU volume in a concurrent copy session stays long busy before the concurrent copy session is suspended.

Example: 500

*LCU\_ID* . . . | -

(Required). Specifies one or more LCUs that are to be modified by this command. An LCU ID is two hexadecimal characters 00 - 1F. You must separate multiple IDs and multiple ID ranges with a space. Accepts a fully qualified LCU ID or a shortened version, if the **-dev** parameter is specified.

To specify a range of LCU IDs, separate the IDs with a hyphen (-).

If you have specified a new subsystem ID value with the **-ss** parameter, only one LCU ID can be specified.

If you use the dash (-), the specified value is read from standard input.

Example: 00-03 08

## Example (1750)

### Invoking the chlcu command

```
dscli>chlcu -dev IBM.1750-68FA120 -critmode enable 00-0F
```

### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

```
LCU 00 successfully modified.
```

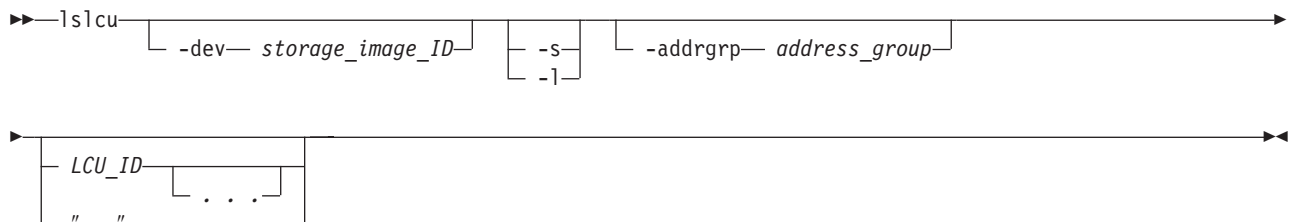
```
LCU 01 successfully modified.
```

```
...
```

```
LCU 0F successfully modified.
```

### lslcu

The **lslcu** command displays a list of logical control units (LCUs) for a storage image and status information for each logical control unit in the list.



## Parameters

**-dev** *storage\_image\_ID*

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number. Displays only the objects for the storage unit that is specified.

Example: IBM.1750-68FA120

**-s** (Optional). Use this parameter to display LCU IDs only. You cannot use the **-l** and the **-s** parameters together.

**-l** (Optional). Use this parameter to display the default output. You cannot use the **-l** and the **-s** parameters together.

**-addrgrp** *address\_group*

(Optional). Specifies an address group. Only the LCUs that belong to the specified address group are displayed. An address group is a single character in the range of 0 - 9 or A - F.

**LCU\_ID** . . . | -

(Optional). Specifies the ID associated with an LCU. An LCU ID is two hexadecimal characters 00 - 1F (1750 only).

To specify a range of LCU IDs, separate the LCU IDs with a hyphen (-).

You must separate multiple LCU IDs or ranges of LCU IDs with a blank space between each ID or range of IDs.

If you use the dash (-), the specified value is read from standard input.

Example: 00-03 08

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following table represents the headers that are displayed on the output report that is associated with the **lslcu** command using the **-l** parameter. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750.

### Invoking the lslcu command

```
dscli>lslcu -dev IBM.2107-75FA120 -l
```

### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM
DS CLI Version: 5.0.0.0 DS:
IBM.2107-75FA120
```

| ID                  | Group | addr-<br>grp | cfg-<br>vols | subsys | con-<br>base-<br>type |
|---------------------|-------|--------------|--------------|--------|-----------------------|
| IBM.2107-75FA120/10 | 0     | 0            | 256          | 8010   | 3990-6                |
| IBM.2107-75FA120/11 | 1     | 0            | 256          | 8011   | 3990-6                |
| IBM.2107-75FA120/12 | 0     | 0            | 256          | 8012   | 3990-6                |
| IBM.2107-75FA120/13 | 1     | 0            | 256          | 8013   | 3990-6                |

### Report field definitions

**ID** Specifies the LCU ID.

This is a unique identifier that is assigned to this logical control unit object. The ID includes the Storage Image ID and the 2-digit LCU ID.

**Group** Specifies the server that is managing the logical control unit group. The server is identified as either 0 or 1.

**Addrgrp**  
Specifies the address group object of which the logical control unit is a member.

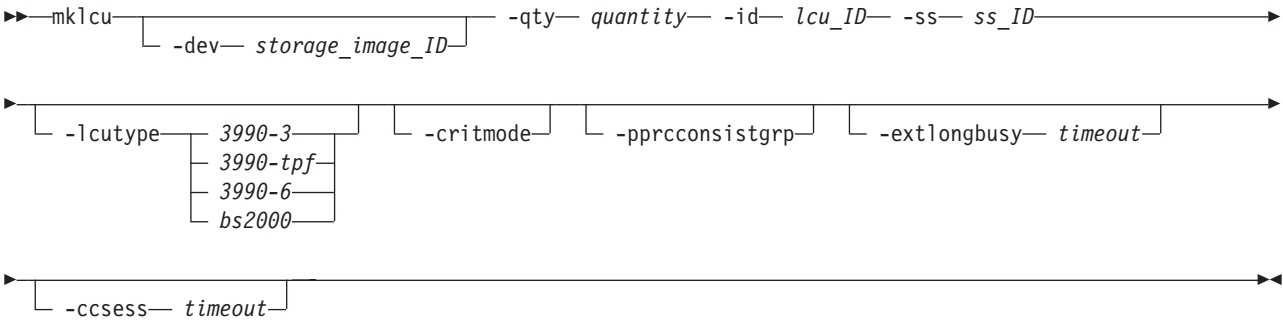
**Confgvols**  
Specifies the number of volumes, or logical devices assigned to the LCU ID. This number includes base CKD volumes and alias CKD volumes.

**Subsys**  
Specifies the value you assigned, or the default SSID value.

**Conbasetype**  
Specifies the LCU type. The allowable values include the following LCU types:

- 3390-3
- 3390-tpf
- 3390-6 (this is the default value if no value is assigned)
- bs2000

**mklcu**  
The **mklcu** command creates a logical control unit (LCU) in a storage image.



## Parameters

### Notes:

1. A logical control unit is configured to represent a grouping of logical CKD volumes.
2. Multiple sequential LCU IDs can be created with a single request, but all logical control units must be of the same type and specify the same options.
3. The DS6000 has a 16 384 volume address space that is partitioned into 64 logical subsystem (LSS) units, where each LSS contains 256 logical volume numbers (1750 only). The 64 LSS units are assigned to one of 4 address groups, where each address group contains 16 LSSs, or 4096 volume addresses. All of the LSSs in one address group must be of the same type (CKD or fixed block).
4. LCUs are typically created in groups of 16, beginning at LSS address X'x0'.

**-dev** *storage\_image\_ID*

(Optional). Specifies the storage image ID, which includes manufacturer, type, and serial number.

Example: IBM.1750-68FA120

**-qty** *quantity*

(Required). Specifies the number of LCU IDs to be created. The valid range is 1 - 64 (1750 only).

This command is rejected if any of the LCU IDs which are based on the initial LCU ID and the quantity, are currently defined or are outside the range of supported LCU IDs. The valid LCU ID range is 00 - 1F (1750 only).

Example: 16

**-id** *lcu\_ID*

(Required). Specifies the LCU ID to be created, or the first LCU ID in a sequence of LCU IDs to be created. A LCU ID is two hexadecimal characters 00 - 1F (1750 only).

Example: 00

**-ss** *ss\_ID*

(Required). Specifies the subsystem ID that you have assigned. A subsystem ID is four hexadecimal characters 0x0001 - 0xFFFF. If multiple LCU IDs are being created, then the SSID value increments for each additional LCU ID that is created.

If 16 LCUs are created, starting with SSID 0x10, then the SSID values are 0x0010 – 0x001F.

Example: 0010

**-lcutype** 3990-3 | 3990-tpf | 3990-6 | bs2000

(Optional). Specifies that one of the following types of LCU be created:

**3990-3** type 3990 model 3

**3990-tpf**  
type 3990 model 3 for tpf

**3990-6** type 3990 model 6

**bs2000**  
type bs 2000

**-critmode**

(Restricted). Specifies that critical heavy mode be enabled. Critical Heavy mode controls the behavior of the remote copy and mirror pairs that have a primary logical volume on this LCU. The default value is disable.

You must have administrator privileges to specify this option. See the **mkpprc** command for additional notes about the use of this parameter.

**Note:** If an attempt is made to create the LCU and enable the critical heavy mode but the user does not have the authority to enable the **-critmode** parameter, two messages are displayed when the command is processed:

- One message states that the LCU has been successfully created
- A second message states "Your user ID does not have the authority to perform this operation"

So, the LCU is created but the critical heavy mode is **not** enabled.

**-pprconsistgrp**

(Optional). Specifies a remote mirror and copy consistency group state setting. Any volume that becomes suspended that is associated with the subsystem LSS passes into an extended Long Busy state unless the consistency group that was created previously has been received. Otherwise, the volume does not become long busy.

**-extlongbusy *timeout***

(Optional). Specifies the time in seconds that an LCU consistency group volume stays long busy after reporting an error that causes a remote mirror and copy suspension if a consistency group has not been created. The default value is 120 seconds.

**-ccsess *timeout***

(Optional). Specifies the **concurrent copy session timeout** parameter as the time in seconds that any LCU volume in a concurrent copy session stays long busy before suspending a concurrent copy session. The valid timeout range is 1 - 9999 seconds. The default value is 300 seconds.

Example: 500

**Example (1750)****Invoking the mklcu command**

```
dscli>dscli>mklcu -dev IBM.1750-68FA120 -qty 16 -id 00 -ss FF00
```

**The resulting output**

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

```
LCU 00 successfully created.
```

```
LCU 01 successfully created.
```

```
...
```

```
LCU 0F successfully created.
```

**rmlcu**

The **rmlcu** command deletes existing logical control units.

```

>> rmlcu -dev storage_image_ID -quiet LCU_ID . . .
 " _ "

```

**Parameters****-dev *storage\_image\_ID***

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for all logical control units.

Example: IBM.1750-68FA120

**-quiet**

(Optional). Turns off the confirmation prompt for this command.

```
LCU_ID . . . | -
```

(Required). An array of one or more LCUs to be removed. This parameter accepts a fully qualified LCU ID or a shortened version, if the **-dev** parameter is specified. A LCU ID is two hexadecimal characters in the range 00 - 1F (1750 only).

To specify a range of LCU IDs, separate the LCU IDs with a hyphen (-).



You must separate multiple LCU IDs or ranges of LCU IDs with a blank space between each ID or range of IDs.

Example: 00-03 08

If you use the dash (-), the specified value is read from standard input.

### Example (1750)

#### Invoking the `rmlcu` command

```
dsccli>rmlcu -dev IBM.1750-68FA120 00-0F
```

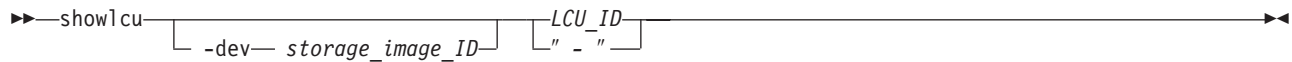
#### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

```
Are you sure you want to delete LCU 00 ? y/n Y
LCU 00 successfully deleted.
Are you sure you want to delete LCU 01 ? y/n Y
LCU 01 successfully deleted.
...
Are you sure you want to delete LCU 0F ? y/n Y
LCU 0F successfully deleted.
```

#### `showlcu`

The `showlcu` command displays the detailed properties of an individual logical control unit (LCU).



### Parameters

**-dev** *storage\_image\_ID*

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the logical control unit.

Example: IBM.1750-68FA120

*LCU\_ID* | -

(Required). Displays the properties for the specified logical control unit. The LCU ID is a 2-digit hexadecimal number in the range of (1750 only) 00 - 1F.

Accepts a fully qualified LCU ID, which consists of the storage image ID or a shortened version without the storage image ID, if the **-dev** parameter is specified.

If you use the dash (-), the specified value is read from standard input.

Example: IBM.1750-68FA120/10

### Example

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the `showlcu` command. A separate example is not shown for the 1750. However, there is one difference between what is displayed on the

output report for a 2107 versus a 1750. The 2107 displays a value for xrcsesstimout (XRC session timeout), which is not supported on the 1750.

### Invoking the showlcu command

```
dsccli>showlcu -dev IBM.2107-75FA120 10
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

| ID                  | Group | Addr-grp | Config-vols | Subsys | Con-base-type |
|---------------------|-------|----------|-------------|--------|---------------|
| IBM.2107-75FA120/10 | 0     | 1        | 256         | 0010   | 3990-6        |

| pprc-consist-grp | xtndlbz-timeout (secs) | ccsess-timeout (secs) | xrc-sess-timeout (secs)      | crit-hvmode |
|------------------|------------------------|-----------------------|------------------------------|-------------|
| Disabled         | 120                    | 300                   | (1750 only)<br>Not supported | Disabled    |

### Report field definitions

**ID** Specifies the unique identifier that is assigned to this logical control unit object. It includes the storage image ID and the 2-digit LCU ID 1750 only (00 - 1F).

**Group** Specifies the server that manages the logical control unit group. The displayed values are 0 or 1.

**Addrgrp** Specifies the address group object that the logical control unit is a member of.

**Configvols** Specifies the number of volumes or the logical devices that are assigned to this LCU ID. This number includes base count key data (ckd) volumes and alias ckd volumes.

**Subsys** Specifies the subsystem ID that you assigned to this logical control unit. The range of values that you selected from is 0001 - FFFF.

**Conbasetype** Specifies the LCU type that you designated for the logical control unit. If you did not designate a type, the default value of 3990-6 is assigned and displayed.

**Pprcconsistgrp** Specifies the assigned PPRC consistency group state setting. If you do not designate enabled, the default value of disabled is assigned.

#### **Xtndlbztimeout (secs)**

Specifies the assigned extended long busy timeout value. If you do not designate a value, the default value of 120 seconds is assigned and displayed.

#### **Ccsessttimeout (secs)**

Specifies the assigned concurrent copy session timeout value. If you do not designate a value, the default value of 300 seconds is assigned and displayed.

#### **Crithvmode**

Specifies whether the critical heavy mode for Remote Mirror and Copy operations is in effect. If you do not designate a value, the default value of Disabled is assigned and displayed.

## **CKD logical volume specific commands**

This section contains commands that are used to create, modify, and delete count key data (CKD) logical volumes for zSeries systems and to display logical volume information.

Use the following commands to create, modify, and delete count key data logical volumes and to display logical volume information:

- **chckdvol**
- **lsckdvol**
- **mkaliasvol**
- **mkckdvol**
- **rmckdvol**
- **showckdvol**

The **chckdvol** command modifies the nickname that you assigned to the count key data (CKD) base volume.

The **lsckdvol** command generates a report that displays a list of count key data (CKD) base and alias volumes in a storage unit and the status information for each volume in the list.

The **mkaliasvol** command creates zSeries CKD alias volumes (generally referred to as parallel access volumes or PAVs) in a storage unit.

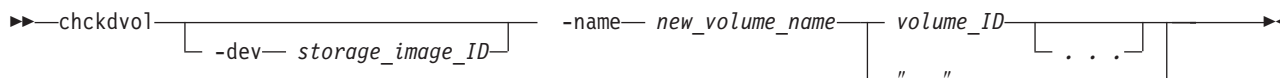
The **mkckdvol** command creates zSeries count key data (CKD) base CKD volumes in a storage image.

The **rmckdvol** command deletes one or more specified count key data (CKD) base or alias volumes from a storage unit.

The **showckdvol** command generates two reports. One report displays the detailed properties of a specified count key data volume. The other report displays the performance metrics for specified count key data volume.

### **chckdvol**

The **chckdvol** command changes the name of a count key data (CKD) base volume.



## Parameters

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified volume\_ID.

**-name** *new volume name*

(Required) User specified nickname for this CKD base volume. This nickname should not exceed 16 characters. It can contain one of the following wild cards:

- (#d) - insert volume\_ID (decimal format)
- (#h) - insert volume\_ID (hexadecimal format)

volume ID . . . | -

(Required) An array of one or more CKD base volume IDs or volume ID ranges to modify.

A volume ID range is defined by two volume IDs that are separated by a dash. Multiple volume IDs or volume ID ranges must be separated with a blank space between each ID.

Example: 0100-010F 0180-018F 0120

The volume ID format is hexadecimal *LLVV*, where *LL* is a logical control unit number 00 - 1F (1750 only), and *VV* is a volume number (00 - FF) that is contained by a logical subsystem object. You must fully qualify the volume ID with manufacturer, type, and serial number if you do not use the **-dev** parameter.

If you use the dash (-), the specified value is read from standard input.

### Example (1750)

## Invoking the chkdvol command

```
dscli>chckdvol -dev IBM.1750-68FA120 -name my volume #d 0100
```

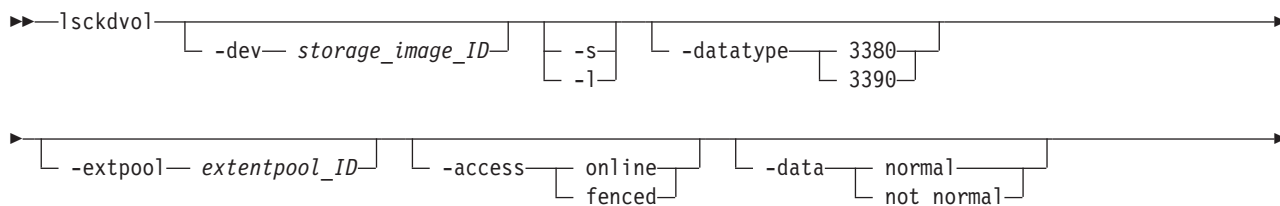
### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120

CKD volume 0100 successfully modified.

## Isckdvol

The **lsckdvol** command displays a list of count key data (CKD) base and alias volumes in a storage image and status information for each volume in the list.





*volume\_ID* . . . | -

(Optional) Displays volumes with the specified IDs. The volume ID format is four hexadecimal characters *LLVV* that represent the following values:

**LL (for a DS8000 model)**

Specifies the logical control unit number, 00 - FE

**LL (for DS6000 model)**

Specifies the logical control unit number, 00 - 1F

**VV (for both the DS8000 and DS6000 model)**

Specifies the volume number, 00 - FF

To specify a range of volume IDs, separate the volume IDs with a dash (-).

You must separate multiple volume IDs or ranges of volume IDs with a blank space between each ID or range of IDs.

Example: 0100-010F 0180-018F 0120

If you use the dash (-), the specified value is read from standard input.

However, you cannot use the dash (-) while you are in the DS CLI interactive command mode.

## Example

For this command and all other DS CLI show commands, the results are shown in table format for clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **lsckdvol** command using the **-l** parameter. A separate example is not shown for the DS6000 model because the information (except for parameters that are not used with the DS6000) is the same for both the DS8000 and DS6000 models.

**Note:** If a column heading applies to the DS8000 only, a null (-) value is displayed when the report is generated for a DS6000 model.

The following example is based on the output results for a volume with 3340 cylinders.

## Invoking the lsckdvol

```
dscli>lsckdvol
-dev IBM.2107-1300861 -l 1410
```

## The resulting output

Date/Time: April 12, 2005 6:06:31 PM JST IBM DS CLI Version: 5.0.3.40  
DS: IBM.2107-1300861

| Name                   | ID   | acc<br>state | data<br>state | config<br>state | device<br>MTM | volser | data<br>type |
|------------------------|------|--------------|---------------|-----------------|---------------|--------|--------------|
| My_<br>volume<br>_1410 | 1410 | Online       | Normal        | Normal          | 3390-9        | A03976 | 3390         |

| voltype  | orgbvols | extpool | sam      | cap (cyl) | cap<br>(2^30B) | cap<br>(10^9B) |
|----------|----------|---------|----------|-----------|----------------|----------------|
| CKD base | -        | P2      | standard | 3340      | 2.6            | 2.8            |

## Report field definitions

**Name** Identifies the nickname that you assigned to the designated volume object.

**ID** Identifies the unique identifier that is assigned to the designated volume object

### **Accstate (access state)**

One of the following designations can be displayed:

#### **Online**

Specifies that the logical volume is accessible to a host.

#### **Fenced**

Specifies that the logical volume is in the volume fenced state and is not accessible to the host.

#### **- (null)**

Specifies that the logical volume is designated as a CKD alias volume.

### **Datastate**

One of the following designations can be displayed:

#### **Normal**

Specifies that none of the other data states apply. The access state is Online.

#### **Pinned**

Specifies that none of the other data states apply and the logical volume has one or more pinned nonretryable tracks. The access state is Online.

#### **Read only**

Specifies that the logical volume is read only because one or more extents on the logical volume are on a rank in the read only data state. The access state is Online.

#### **Inaccessible**

Specifies that one or more extents that are associated with the logical volume are on a rank that is in the inaccessible data state. The access state is Fenced.

#### **Indeterminate data loss**

Specifies that the following data states do not apply and that one of the following conditions has occurred:

Data states that do not apply:

- Rank failed
- Rank repairing
- Rank repaired
- Global inaccessible
- Global lost data

Conditions - one of the following occurred:

- Committed write data was lost before it was destaged and the track identifiers that are associated with the data are unknown.
- Data was lost that indicated extents on the logical volume were active FlashCopy targets.

The access state is fenced.

**Rank failed**

Specifies that one or more extents that are associated with the logical volume are on a rank that is in the failed data state. The access state is Fenced.

**Rank repairing**

Specifies that one or more extents that are associated with the logical volume are on ranks that are in the repairing data state. The access state is Fenced.

**Rank repaired**

Specifies that one or more extents that are associated with the logical volume are on ranks that were in the repairing state, but are not in the repairing state now. The access state is Fenced.

**Global inaccessible**

Specifies that the global metadata that is associated with the logical volume configuration is inaccessible. Some of the data that is associated with the logical volume might be inaccurate. The access state is Fenced.

**Global lost**

Specifies that global metadata that is associated with the logical volume configuration has been lost. As a result, some of the data that is associated with the logical volume might be inaccurate. The access state is fenced.

**NVS data inaccessible**

Specifies that active NVS data is inaccessible for one or more logical volumes of an LSS group. The logical volumes in the LSS group cannot be made accessible. The access state is Fenced.

**- (null)**

Specifies that the logical volume is designated as a CKD alias.

**Configstate**

One of the following configuration states are displayed:

**Normal**

Indicates that there are no logical volume configuration operations in progress.

**Configuring**

Indicates that the logical volume is in the process of being configured for the first time.

**Reconfiguring**

Indicates that the logical volume is in the process of allocating or deallocating extents due to a modification of the requested capacity attribute after initial creation.

**Migrating**

Indicates that the logical volume is in the process of performing dynamic volume relocation to a specified extent pool.

**Deconfiguring**

Indicates that the logical volume is in the process of being deleted.

**Configuration error**

Indicates that the initial configuration did not complete successfully. This state reflects an internal error condition and not an error in the request to create the volume.



**Corrective action:** Use the **rmfbvol** command to delete each volume that is listed with the configuration state of Configuration error.

**Reconfiguration error**

Indicates that the reconfiguration request did not complete successfully.

**Migration error**

Indicates that the dynamic volume relocation operation was ended during processing.

**Deconfiguration error**

Indicates that a request to delete a volume did not complete successfully. This state reflects an internal error condition and not an error in the request to remove the volume. To correct this state, you must reissue the **rmfbvol** command for the designated volume.

**deviceMTM**

One of the following is displayed:

- 3380-2
- 3380-3
- 3390-3
- 3390-9

Device MTM is determined by the CKD base volume data type and volume capacity (in cylinders).

**Volser** Specifies the base CKD volume serial number written by the user at track address 0x0000, record 3.

**Datatype**

Identifies the volume data type setting.

**Voltype**

Specifies that the logical volume is one of the following:

- CKD base
- CKD alias

**Orgbvols (original base vol)**

One of the following is specified:

- Identifies the original base CKD volume ID to which this CKD alias volume is assigned.
- For a CKD Alias type volume, the base and alias volume IDs are of a common LCU ID.
- (-) null is displayed for a CKD base volume type.

**Extpool**

Identifies the extent pool ID. Volume extents are allocated from this extent pool ID.

**Cap (cyl)**

Specifies the quantity of volume CKD cylinders that are available for host system access.

**Cap (2^30B)**

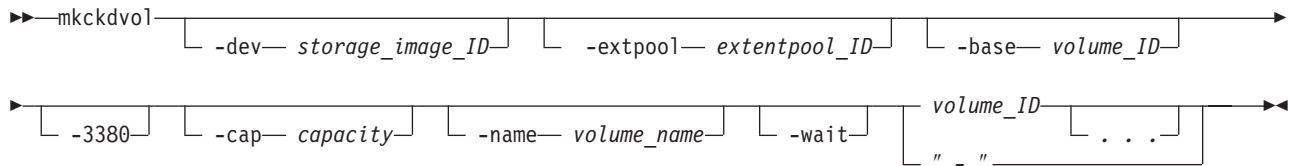
Specifies the size of volume that is available for host system access in 2^30B (binary GB) unit.

**Cap (10^9B)**

Specifies the size of volume that is available for host system access in 10^9B (decimal GB) unit.

## mkckdvol

The **mkckdvol** command creates zSeries count key data (CKD) base or CKD alias volumes in a storage image.



### Parameters

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number.

**-extpool** *extentpool\_ID*

(Optional) Creates the base or alias volumes from data extents that are contained in this extent pool. The extent pool storage type defines the volume storage type. An extent pool ID is a four-digit decimal number with no leading zeroes, prefixed with the letter *P*.

**Note:** This parameter is not required and ignored if the **-base** parameter is specified.

**-base** *volume\_ID*

(Optional) Specifies an existing base CKD volume ID. The volume ID format is four hexadecimal characters *LLVV*, where *LL* is a logical control unit number 00 - 1F (1750 only), and *VV* is a volume number (00 - FF).

Use the **-base** parameter to create one or more CKD alias volumes that are assigned to the specified base CKD volume ID. The LCU ID component for all volume IDs must be identical.

**Note:** It is recommended that you use the **-mkaliasvol** command to create alias volumes.

**-3380**

(Optional) Specifies the 3380 volume type setting. Otherwise, the 3390 volume type is created. The **-3380** parameter is ignored when the **-base** parameter is specified.

**Note:** You must ensure that the volume data type is compatible with the host systems that access this volume.

**-cap** *capacity*

(Optional) Specifies the quantity of CKD cylinders that are allocated to this volume. The **-cap** parameter is ignored when the **-base** parameter is specified.

For a 3380 specification, the **-cap** parameter value is 2226 (1.59 GB) or 3339 (2.37 GB).

For 3390 volumes (default type), the **-cap** parameter can be a value in the range of 1 to 65 520 (849KB to 55.68 GB).

**Note:** This parameter is not required, and it is ignored if the **-base** parameter is specified.

**-name** *volume\_name*

(Optional) Specifies your nickname for the CKD base volumes that are created by this command. Your volume name cannot exceed 16 characters. It can contain one of the following wild cards:

- (#d) insert volume ID (decimal)
- (#h) insert volume ID (hexadecimal)

**Note:** The **-name** parameter is ignored when the **-base** parameter is specified.

**-wait**

(Optional) Specifies that the command response be delayed until the volume configuration processes complete.

*volume\_ID* . . . | -

(Required) Specifies an array of one or more CKD base or alias volume IDs or volume ID ranges to be created. The volume IDs must share a common logical control unit ID.

**Note:** Volumes are automatically assigned to the FICON/ESCON – ALL volume group ID 10.

The volume ID format is hexadecimal *LLVV* where *LL* is a logical control unit number 00 - 1F (1750 only), and *VV* is a volume number (00 - FF).

A volume ID range is defined by two volume IDs that are separated by a dash.

You must separate multiple volume IDs or ranges of volume IDs with a blank space between each ID or range of IDs.

**Note:** Multiple volumes can be created with a single request, but all volumes must have the same capacity, extent pool, and data type.

Example: 0100-010F 0180-018F 0120

If you use the dash (-), the specified value is read from standard input. You cannot use the dash (-) if you are in the DS CLI interactive mode.

## Example (1750)

### Invoking the mkckdvol command

```
dscli>mkckdvol -dev IBM.1750-68FA120
-extpool P1 -name my_volume_#d -cap 3339 0100 0101 0102 0103
```

### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS IBM.1750-68FA120
```

```
CKD volume 0100 successfully created.
CKD volume 0101 successfully created.
CKD volume 0102 successfully created.
CKD volume 0103 successfully created.
```

## rmckdvol

The **rmckdvol** command deletes count key data (CKD) base or alias volumes from a storage image.



## Parameters

A specific use of this command is made when you are confronted with a volume or volumes that are in a configuration state of "configuration error." To correct this configuration state, issue the **rmckdvol** command for each affected volume. You can specify a volume range according to the command specifications when it is appropriate.

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for all logical volumes.

**-quiet**

(Optional) Turns off the confirmation prompt for this command.

*volume\_ID* . . . | -

(Required) An array of one or more CKD base or CKD alias volume IDs or volume ID ranges to be removed. Accepts a fully qualified volume ID, which includes the storage image ID or a shortened version without the storage image ID if the **-dev** parameter is specified. The shortened volume ID format is hexadecimal *LLVV* where *LL* is a logical control unit (LCU) number 00 - 1F (1750 only), and *VV* is a volume number (00 - FF) that is contained by a logical control unit (logical subsystem).

**Note:** A CKD base volume cannot be removed if an alias volume is associated with it.

A volume ID range is defined by two volume IDs that are separated by a dash.

You must separate multiple volume IDs or ranges of volume IDs with a blank space between each ID or range of IDs.

(1750) Example: 0100-010F 0180-1FFF 0120

If you use the dash (-), the specified value is read from standard input.

## Example (1750)

### Invoking the rmckdvol command

```
dscli>rmckdvol -dev IBM.1750-68FA120 0000 0001
```

### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

```
Are you sure you want to delete Volume 0000? y/n Y
```

```
Volume 0000 successfully deleted.
```

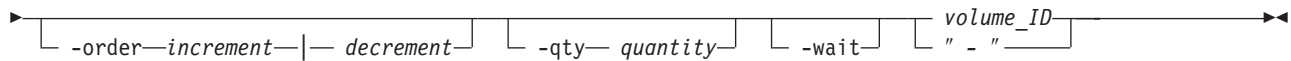
```
Are you sure you want to delete Volume 0001? y/n Y
```

```
Volume 0001 successfully deleted.
```

### mkaliasvol

The **mkaliasvol** command creates zSeries CKD alias volumes (generally referred to as parallel access volumes or PAVs) in a storage image.

```
➤➤ mkaliasvol |-----|
 | -dev— storage_image_ID—| | -base— volume_ID (volume_ID_range)—|
```



## Parameters

**Note:** Volumes are automatically assigned to the FICON/ESCON – ALL volume group ID 10.

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number.

**-base** *volume\_ID (volume\_ID\_range)*

(Required) Specifies an existing base CKD volume ID or a volume ID range.

**Note:** You cannot use multiple volume IDs separated by commas and multiple ID ranges in combination. This combination is rejected.

Use the **-base** parameter to create one or more CKD alias volumes that are assigned to the specified base CKD volume ID. The LCU ID component for all volume IDs must be identical.

The alias volume IDs are assigned consecutively in the order specified by the **-order** parameter. The following examples show the processing affects of the **-order** parameter:

```
dscli>mkaliasvol -base 0000 -order increment -qty 2 0080 creates two alias
volumes 0080 and 0081 for base volume 0000.
```

```
dscli>mkaliasvol -base 0000-003F -order increment -qty 2 0080
creates two alias volumes for each base volume as follows:
0080,0081 for base volume 0000
0082,0083 for base volume 0001
...
00FE,00FF for base volume 003F
```

**-order** *increment | decrement*

(Optional) Specifies the order in which alias volume IDs are assigned. For example:

```
dscli>mkaliasvol -base 0000-003F -order decrement -qty 2 00FF
creates two alias volumes for each base volume as follows:
00FF,00FE for base volume 0000
00FD,00FC for base volume 0001
...
0081,0080 for base volume 003F
```

**Note:** If the **-order** parameter is not specified the default value is decrement.

**-qty** *quantity*

(Optional) Specifies the number of alias volumes that will be assigned to each specified CKD base volume.

**-wait**

(Optional) Delays the command response until the volume configuration processes complete.

*volume\_ID -*

(Required) Identifies the starting alias volume ID in a sequence of volume IDs to be created

The volume ID format is hexadecimal *LLVV* where *LL* is a logical control unit number 00 - 1F (1750 only), and *VV* is a volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input.

## Example (1750)

### Invoking the mkaliasvol command

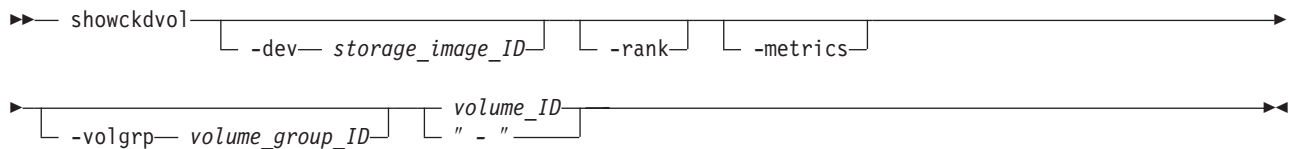
```
dscli> mkaliasvol -dev IBM.1750-68FA120 -base 0100-010F -order
decrement -qty 2 01FF
```

### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version:
5.0.0.0 DS: IBM.1750-68FA120
CKD Volume 01FF successfully created.
CKD Volume 01FE successfully created.
...
CKD Volume 01E1 successfully created.
CKD Volume 01E0 successfully created.
```

### showckdvol

The **showckdvol** command displays detailed properties of an individual count key data volume. This command can also be used to display the performance metrics for an individual volume ID.



### Parameters

**Note:** All performance counts are an accumulation from the most recent counter wrap or counter reset. A reset of the volume performance counters occurs in association with the following events:

- The storage unit is turned on.
- There has been a server failure, and the server failover or failback sequence has been initiated.

#### **-dev storage\_image\_ID**

(Optional) Specifies the storage image ID, which consists of the manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified volume ID.

#### **-rank**

(Optional) Specifies that a rank extents table be displayed. This table displays the set of ranks that the logical volume has extents configured on and the number of extents for that logical volume.

**Note:** This parameter cannot be used with the **-metrics** or **-volgrp** parameters.

#### **-metrics**

(Optional) Displays the volume ID and performance metrics for the specified volume.

#### Notes:

1. All performance counts are an accumulation since the most recent counter wrap or counter reset. Volume performance counters are

reset on a power-up sequence. Volume performance counters are reset by a server failover and failback sequence.

2. Do not use this parameter with the **-rank** or **-volgrp** parameters.

**-volgrp** *volume\_group\_ID*

(Required if you do not specify the *volume\_ID* parameter.) Specifies that the CKD volumes that are associated with the designated volume group ID be displayed. There is only one volume group for CKD volumes and it contains all volumes.

**Notes:**

- The **-volgrp** parameter can only be used when you are doing a query for performance metrics.
- Do not use the **-volgrp** parameter with the *volume\_ID* parameter.
- Do not use the **-volgrp** parameter with the **-rank** or **-metrics** parameters.

*volume\_ID* -

(Optional) Specifies that you want the system to display detail information about the designated volume. The volume ID format is four hexadecimal characters *LLVV* that represent the following values:

**LL (for a DS8000 model)**

Specifies the logical control unit number, 00 - FE

**LL (for DS6000 model)**

Specifies the logical control unit number, 00 - 1F

**VV (for both the DS8000 and DS6000 model)**

Specifies the volume number, 00 - FF

If you use the dash (-), the specified value is read from standard input. However, you cannot use the dash (-) while you are in the DS CLI interactive command mode.

## Example

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output reports that are associated with the **showckdvol** command using the **-rank** parameter. When the rank parameter is specified, a rank extents table is also displayed. It appears at the end of the regular report.

### Invoking the showckdvol to show volume properties

**Note:** The following example is based on the use of the **showckdvol** command for a 3390 volume with 3339 cylinders.

```
dscli>showckdvol -dev
IBM.2107-1300861 -rank 1410
```

### The resulting output

```
Date/Time: April 13, 2005 3:44:27 PM JST IBM DS CLI Version: 5.0.3.40 DS:
IBM.2107-1300861
```

| Name                   | ID   | acc state | data state | config state | device MTM | volser | data type |
|------------------------|------|-----------|------------|--------------|------------|--------|-----------|
| My_<br>volume_<br>1410 | 1410 | Online    | Normal     | Normal       | 3390-3     | A03967 | 3390      |

| voltype     | orgb-vols | addrgrp | extpool | exts | cap (cyl) | cap (2^30B) | cap (10^9B) | Ranks |
|-------------|-----------|---------|---------|------|-----------|-------------|-------------|-------|
| CKD<br>Base | –         | 1       | P2      | 3    | 3339      | 2.6         | 2.8         | 3     |

| Rank | Extents |
|------|---------|
| R0   | 1       |
| R2   | 2       |

## Report field definitions ( *-metrics* parameter not specified)

### Name

Specifies the nickname that you assigned for this volume object.

**ID** Specifies the unique identifier that is assigned to this volume object.

### Accstate

One of the following designations can be displayed:

#### Online

Specifies that the logical volume is accessible to a host.

#### Fenced

Specifies that the logical volume is in the volume fenced state and is not accessible to the host.

#### - (null)

Specifies that the logical volume is designated as a CKD alias volume.

### Datastate

One of the following designations can be displayed:

#### Normal

Specifies that none of the other data states apply. The access state is Online.

#### Pinned

Specifies that none of the other data states apply and the logical volume has one or more pinned non-retryable tracks. The access state is Online.

#### Read only

Specifies that the logical volume is read-only because one or more extents on the logical volume are on a rank in the read-only data state. The access state is Online.

#### Inaccessible

Specifies that one or more extents that are associated with the logical volume are on a rank that is in the inaccessible data state. The access state is Fenced.

#### Indeterminate data loss

Specifies that the following data states do not apply and that one of the following conditions has occurred:



Data states that do not apply:

- Rank failed
- Rank repairing
- Rank repaired
- Global inaccessible
- Global lost data

Conditions: One of the following occurred:

- Committed write data was lost before it was destaged and the track identifiers that are associated with the data are unknown.
- Data was lost that indicated extents on the logical volume were active FlashCopy targets.

The access state is Fenced.

#### **Rank failed**

Specifies that one or more extents that are associated with the logical volume are on a rank that is in the failed data state. The access state is Fenced.

#### **Rank repairing**

Specifies that one or more extents that are associated with the logical volume are on ranks that are in the repairing data state. The access state is Fenced.

#### **Rank repaired**

Specifies that one or more extents that are associated with the logical volume are on ranks that were in the repairing state, but are not in the repairing state now. The access state is Fenced.

#### **Global inaccessible**

Specifies that the global metadata that is associated with the logical volume configuration is inaccessible. Some of the data that is associated with the logical volume might be inaccurate. The access state is Fenced.

#### **Global lost data**

Specifies that global metadata that is associated with the logical volume configuration has been lost. As a result, some of the data that is associated with the logical volume might be inaccurate. The access state is Fenced.

#### **NVS data inaccessible**

Specifies that active NVS data is inaccessible for one or more logical volumes of an LSS group. The logical volumes in the LSS group cannot be made accessible. The access state is fenced.

#### **– (null)**

Specifies that the logical volume is designated as a CKD alias.

### **Configstate**

One of the following designations can be displayed:

#### **Normal**

Indicates that there are no logical volume configuration operations in progress.

#### **Configuring**

Indicates that the logical volume is in the process of being configured for the first time.

### **Reconfiguring**

Indicates that the logical volume is in the process of allocating or deallocating extents due to a modification of the requested capacity attribute after initial creation.

### **Migrating**

Indicates that the logical volume is in the process of performing dynamic volume relocation to a specified extent pool.

### **Deconfiguring**

Indicates that the logical volume is in the process of being deleted.

### **Configuration error**

Indicates that the initial configuration did not complete successfully. This state reflects an internal error condition and not an error in the request to create the volume.

**Corrective action:** Use the **rmfbvol** command to delete each volume that is listed with the configuration state of "configuration error".

### **Reconfiguration error**

Indicates that the reconfiguration request did not complete successfully.

### **Migration error**

Indicates that the dynamic volume relocation operation was ended during processing.

### **Deconfiguration error**

Indicates that a request to delete a volume did not complete successfully. This state reflects an internal error condition and not an error in the request to remove the volume. To correct this state, you must reissue the **rmfbvol** command for the designated volume.

### **deviceMTM**

One of the following will be displayed:

- 3380-2
- 3380-3
- 3390-3
- 3390-9

### **Volser**

Specifies the volume serial number. A volume serial number is six bytes of data, displayed as six characters.

### **Datatype**

Specifies the volume data type setting (3380 or 3390).

### **Voltype**

Specifies that the logical volume is one of the following:

- CKD base
- CKD alias

### **Orgbvols(original base vol)**

One of the following will be specified:

- Identifies the original base CKD volume ID to which this CKD alias volume is assigned.
- For a CKD Alias type volume, the base and alias volume IDs share a common LCU ID.
- - (null) is displayed for a CKD base volume type.

**Addrgrp**

Specifies the address group that contains this volume object. An address group ID is one hexadecimal character (0 - F).

**Extpool**

Specifies the extent pool ID.

**Exts**

Specifies the number of extents used by the designated volume ID.

**Cap (cyl)**

Specifies the quantity of volume cylinders that are available for host system access.

**Cap (2^30B)**

Specifies the size of volume that is available for host system access in (2^30B binary GB) units.

**Cap (10^9B)**

Specifies the size of volume that is available for host system access in (10^9B decimal GB) units.

**Ranks**

Specifies the number of ranks the volume resides on.

**Rank (Rank Extent table)**

Specifies the rank ID.

**Extents (Rank Extents table)**

Specifies the number of extents for the volume on the rank.

**Example**

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output reports that are associated with the **showckdvol** command using the **-metrics** parameter.

**Invoking the showckdvol to show performance metrics**

```
dscli>showckdvol -metrics
IBM.2107-75FA120/0101
```

**The resulting output**

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI
Version: 5.0.0.0 DS: IBM.2107-75FA120
```

| ID                                | Date                     | norm<br>rdrqts | norm<br>rdhits | norm<br>write<br>req | norm<br>write<br>hits | seq<br>read<br>reqs | seq<br>read<br>hits | seq<br>write<br>req |
|-----------------------------------|--------------------------|----------------|----------------|----------------------|-----------------------|---------------------|---------------------|---------------------|
| IBM.<br>2107-<br>75FA120<br>/0101 | 10/11<br>/04<br>02:23:49 | 10000          | 10000          | 10000                | 10000                 | 10000               | 10000               | 10000               |

| seqwrite-hits | cachfwr-reqs | cachfwr-hits | cachfw-reqs | cachfw-hits | inbcach-load | bypass-cach | seq DASD trans |
|---------------|--------------|--------------|-------------|-------------|--------------|-------------|----------------|
| 10000         | 10000        | 10000        | 10000       | 10000       | 10000        | 10000       | 10000          |

| DASD-trans | cache-trans | NVS-spadel | norm write ops | seqwrite-ops | rec cache mis | qwrite-prots | CKDir-trkac |
|------------|-------------|------------|----------------|--------------|---------------|--------------|-------------|
| 10000      | 10000       | 10000      | 10000          | 10000        | 10000         | 10000        | 10000       |

| CKD irtrk hits | cachsp-delay | timelow-ifact | phread | phwrite | phwrite | phbyte-read | phbyte-writ |
|----------------|--------------|---------------|--------|---------|---------|-------------|-------------|
| 10000          | 10000        | 10000         | 10000  | 10000   | 10000   | 10000       | 10000       |

| recmo-reads | sfile trk reads | contam-wrts | PPRC-trks | NVS-spallo | timeph-read | timeph-write | byte-read |
|-------------|-----------------|-------------|-----------|------------|-------------|--------------|-----------|
| 10000       | 10000           | 10000       | 10000     | 10000      | 10000       | 10000        | 10000     |

| bytewrit | timeread | timewrite |
|----------|----------|-----------|
| 10000    | 10000    | 10000     |

### Report field definitions ( *-metrics* parameter specified)

**ID** Specifies the unique identifier that is assigned to this volume object.

#### Date

Specifies the current time stamp for the volume performance counters.

#### normrdrqts

Specifies the number of normal read operations that are issued by a host to a volume.

#### normrdhits

Specifies the number of normal read operations where data did not move to or from a storage device.

#### normwritereq

Specifies Write Normal I/O Requests

#### normwritehits

Specifies DASD Fast Write I/O Request Hits

#### seqreadreqs

Specifies Search/Read Sequential I/O Requests

#### seqreadhits

Specifies Search/Read Sequential I/O Request Hits

#### seqwritereq

Specifies Write Sequential I/O Requests

#### seqwritehits

Specifies DASD Fast Write Sequential I/O Request Hits

**cachfwrreqs**  
Specifies Search/Read Cache Fast Write I/O Requests

**cachfwrhits**  
Specifies Search/Read Cache Fast Write I/O Request Hits

**cachfwreqs**  
Specifies Cache Fast Write I/O Requests

**cachfwhits**  
Specifies Cache Fast Write I/O Requests Hits

**inbcachload**  
Specifies Inhibit Cache Loading I/O Requests that operate with DASD

**bypasscach**  
Specifies Bypass Cache I/O Requests

**seqDASDtrans**  
Specifies Sequential DASD to Cache Transfer Operations

**DASDtrans**  
Specifies DASD to Cache Transfer Operation Count

**cachetrans**  
Specifies Cache to DASD Transfer Operation Count

**NVSspadel**  
Specifies DASD Fast Write Operations Delayed Due to nonvolatile storage Space Constraints

**normwriteops**  
Specifies Normal 'DASD Fast Write' Write Operation Counts

**seqwriteops**  
Specifies Sequential Access 'DASD Fast Write' Write Operation Counts

**reccachemis**  
Specifies Number of record cache Read Misses

**qwriteprots**  
Specifies Quick Write Promotes

**CKDirtrkac**  
Specifies Irregular Track Accesses

**CKDirtrkhits**  
Specifies Irregular Track Accesses Hits

**cachspdelay**  
Specifies Operations Delayed Due To Cache Space Constraints

**timelowifact**  
Specifies Milliseconds of lower interface I/O activity for the indicated device.

**phread**  
Specifies Physical Storage Read Operations

**phwrite**  
Specifies Physical Storage Write Operations

**phbyteread**  
Specifies Physical Storage Bytes Read in 128 KB increments.

**phbytewrit**  
Specifies Physical Storage Bytes Written in 128 KB increments.

**recmoreads**

Specifies Record Mode Read Operations

**sfiletrkreads**

Specifies the Number of tracks read from the Concurrent Copy or XRC Sidefile.

**contamwrts**

Specifies the Number of Contaminating writes for a Concurrent Copy or XRC volume

**PPRCtrks**

Specifies the Number of tracks or portion of tracks that were transferred to the secondary device of a PPRC pair.

**NVSspallo**

Specifies the NVS Space Allocations

**timephread**

Specifies the physical storage read response time in 16 ms increments.

**timephwrite**

Specifies the physical storage write response time in 16 ms increments.

**byteread**

Specifies the number of bytes that are read in 128 KB increments

**bytewrit**

Specifies the number of bytes that are written in 128 KB increments.

**timeread**

Specifies the accumulated response time for all read operations.

**timewrite**

Specifies the accumulated response time for all write operations.

## Logical subsystem specific commands

This section contains commands that are used to modify logical subsystems for Open Systems and to display logical subsystem information.

Use the following commands to modify logical subsystems and to display logical subsystem information:

- **chlss**
- **lslss**
- **showlss**

The **chlss** command modifies one or more logical subsystems.

The **lslss** command generates a report that displays a list of logical subsystems (LSSs) for a storage unit and the status information for each logical subsystem in the list.

The **showlss** command generates a report that displays the detailed properties of a specified LSS.

**chlss**

The **chlss** command modifies a logical subsystem.

```

>> chlss -dev storage_image_ID -pprcconsistgrp enable
 disable

```



## Parameters

### **-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for all logical subsystems (LSSs); otherwise, it is optional.

### **-pprconsistgrp** *enable | disable*

(Optional) Enables a volume that is associated with a logical subsystem to become suspended and enter an extended long busy state if it has not received a notification that a consistency group has been created. Otherwise, the volumes associated with the LSS do not go to a long-busy state.

### **-extlongbusy** *timeout*

(Optional) Specifies the time in seconds that an LCU consistency group volume stays long busy after reporting an error that causes a remote mirror and copy suspension if a consistency group has not been created.

### *LSS\_ID ... | -*

(Required) Specifies one or more LSSs to be modified by this command. An LSS ID is two hexadecimal characters 00 - 1F (1750 only).

To specify a range of LSS IDs, separate the IDs with a hyphen.

You must separate multiple LSS IDs or ranges of LSS IDs with a blank space between each ID or range of IDs.

If you use the dash (-), the specified value is read from standard input.

Example: 00-03 08

## Example (1750)

### Invoking the chlss command

```
dscli>chlss -dev IBM.1750-68FA120 06 0F
```

### The resulting output

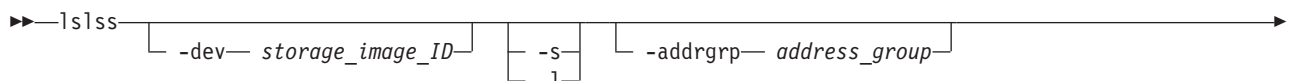
```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

```
LSS 06 successfully modified.
```

```
LSS 0F successfully modified.
```

## lslls

The **lslls** command displays a list of logical subsystems (LSSs) for a storage image and status information for each logical subsystem in the list.



## Parameters

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number.

**-s** (Optional) Displays LSS IDs. You cannot use the **-l** and the **-s** parameters together.

**-l** (Optional) Displays the default output. You cannot use the **-l** and the **-s** parameters together.

**-addrgrp** *address\_group*

(Optional) Displays only LSSs that belong to the specified address group. An address group is a single hexadecimal character (0 - F).

**LSS\_ID . . . | -**

(Optional) Specifies the logical subsystem IDs. An LSS ID is two hexadecimal characters 00 - 1F (1750 only).

To specify a range of logical subsystem IDs, separate the logical subsystem IDs with a hyphen.

You must separate multiple logical subsystem IDs or ranges of logical subsystem IDs with a blank space between each ID or range of IDs.

Example: 00-03 08

If you use the dash (-), the specified value is read from standard input.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following table represents the headers that are displayed on the output report that is associated with the **lsyss** command using the **-l** parameter. A separate example is not shown for the 1750 because the information is the same for both machine types. The only difference is the machine type designation, 2107 versus 1750.

### Invoking the lsyss command

```
dscli>lsyss -dev IBM.1750-75FA120 -l
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

| ID                  | Group | Addrgrp | Stgtype | Confgvols | Subsys |
|---------------------|-------|---------|---------|-----------|--------|
| IBM.2107-75FA120/10 | 0     | 1       | fb      | 256       | FF10   |
| IBM.2107-75FA120/11 | 1     | 1       | fb      | 256       | FF11   |
| IBM.2107-75FA120/12 | 0     | 1       | fb      | 256       | FF12   |



## Report field definitions

**ID** Specifies the unique identifier that is assigned to this logical subsystem object. The identifier includes the storage image ID and a 2-digit hexadecimal number for the LSS ID. The LSS ID can be in the range of 00 - 1F (1750 only).

**Group** Specifies the server that is managing the logical subsystem group. The server is identified as either 0 or 1.

**Addrgrp**

Specifies the address group object of which the logical subsystem is a member.

**Stgtype**

Specifies the type of storage volumes that are contained by this logical subsystem. The displayed value is either fb (fixed block) or ckd (count key data).

**Configvols**

Specifies the number of volumes currently assigned to this logical subsystem.

**Subsys**

Specifies the user assigned, or default SSID value.

## showlss

The **showlss** command displays detailed properties of a logical subsystem (LSS).

```
➤— showlss — [-dev— storage_image_ID] [LSS_ID] —➤
```

## Parameters

**-dev storage\_image\_ID**

(Optional) Specifies the storage image ID, which consists of manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for the logical subsystem; otherwise, it is optional.

**LSS\_ID | -**

(Required) Displays the properties for the specified logical subsystem. This parameter accepts a fully qualified LSS ID, which consists of the storage image ID, or a shortened version without the storage image ID if the **-dev** parameter is specified. The shortened version is two hexadecimal digits in the range 00 - 1F (1750 only).

The following is an example of a fully qualified LSS ID: IBM.2107-75FA120/10

The following is an example of a shortened version of the LSS ID when the **dev** parameter is specified:

```
dscli>showlss -dev IBM.2107-75FA120 10
```

If you use the dash (-), the specified value is read from standard input.

## Example

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **showlss** command. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750.

**Invoking the showlss command to show default information**

dsccli>showlss IBM.2107-75FA120/10

**The resulting output**

DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120  
Sun Aug 11 02:23:49 PST 2004 IBM

| ID                  | Group | Addrgrp | Stgtype | Confgvols |
|---------------------|-------|---------|---------|-----------|
| IBM.2107-75FA120/10 | 0     | 1       | fb      | 256       |

| Pprconsistgrp | Xtnldbztimeout (secs) | Subsys |
|---------------|-----------------------|--------|
| Disabled      | 120                   | FF10   |

**Report field definitions**

- ID** Specifies the unique identifier that is assigned to this logical subsystem. It includes the storage image ID and the 2 digit LSS ID 00 - 1F (1750 only).
- Group** Specifies the server that manages the logical subsystem. The displayed values are 0 or 1.
- Addrgrp** Specifies the address group object that the logical subsystem is a member of.
- Confgvols** Specifies the number of volumes that are assigned to this logical subsystem.
- Stgtype** Specifies the type of storage volumes contained by this logical subsystem. The value displayed is fb (fixed block) or ckd (count key data)
- Pprconsistgrp** Specifies the assigned PPRC consistency group state setting. If you do not designate enabled, the default value of disabled is assigned.
- Xtnldbztimeout (secs)** Specifies the assigned extended long busy timeout value. If you do not designate a value, the default value of 120 seconds is assigned and displayed.
- Subsys** Specifies the user assigned, or default SSID value.

**Fixed block logical volume specific commands**

This section contains commands that are used to create, modify, and delete fixed block logical volumes for Open Systems and to display logical volume information.

Use the following commands to create, modify, and delete fixed block logical volumes and to display logical volume information:

- **chfbvol**
- **lsfbvol**
- **mkfbvol**
- **rmfbvol**
- **showfbvol**

The **chfbvol** command modifies the name or data type of a fixed block volume.

The **lsfbvol** command generates a report that displays a list of fixed block volumes in a storage unit and the status information for each volume in the list.

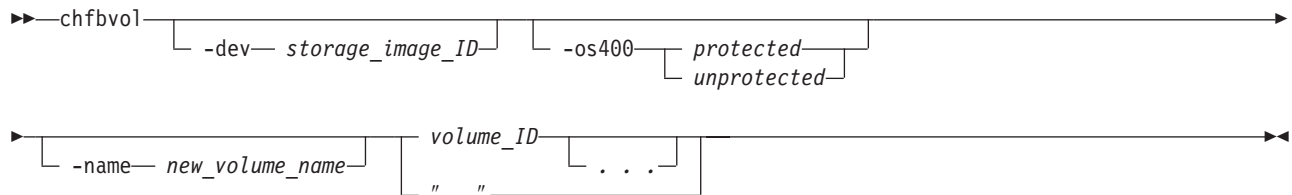
The **mkfbvol** command creates open systems fixed block volumes in a storage unit.

The **rmfbvol** command deletes one or more specified fixed block volumes from a storage unit.

The **showfbvol** command generates two types of reports. The first report displays the detailed properties for a specified fixed block volume. The second report displays the performance metrics for a specified fixed block volume.

### chfbvol

The **chfbvol** command changes the name or data type of a fixed block volume.



### Parameters

#### -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which consists of manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified volume ID.

#### -os400 protected | unprotected

(Optional) Specifies options for the OS 400 volume data types. If the current volume data type is os400-protected (FB 520P) or os400-unprotected (FB 520U) then this data type can be modified to either os400-unprotected (FB 520U) or os400-protected (FB520P) respectively. If the current volume data type is 512, then this setting cannot be modified.

#### Notes:

1. If the volume is unassigned to any iSeries or nonconfigured, you can use this parameter to change the designated protection value.
2. If the volume is assigned and is a part of the i5/OS configuration, you cannot use this parameter to change the protection value. The only way to change the protection value on a volume that is part of the i5/OS configuration is to perform the following steps, using extreme caution:

- a. Remove the volume from the i5/OS application (this must be done first)
- b. Remove the volume from DS system
- c. Create a new volume and assign the correct protection value.

**-name** *new\_volume\_name*

(Optional) Specifies your nickname for this volume. A nickname cannot exceed 16 characters.

**volume\_ID** . . . | -

(Required) Specifies one or more volume IDs to be modified. The volume ID is a 32-bit number that can be represented as 4 hexadecimal digits in the form of *XYZZ* where *X* is the address group (0 - 1), *XY* together is the logical subsystem number 00 - 1E (for 1750) , and *ZZ* is the volume number (00 - FF). You must fully qualify the volume ID with manufacturer, machine type, and serial number if you do not use the **-dev** parameter.

To specify a range of volume IDs, separate the volume IDs with a hyphen.

You must separate multiple volume IDs or ranges of volume IDs with a blank space between each ID or range of IDs.

Example: 0100-010F 0180-018F 0120

If you use the dash (-), the specified value is read from standard input.

However, you cannot use this feature if you are using the DS CLI interactive command mode.

## Example (1750)

### Invoking the chfbvol command

```
dscli>chfbvol -dev IBM.1750-68FA120 -os400 protected 0100 0101
```

### The resulting output

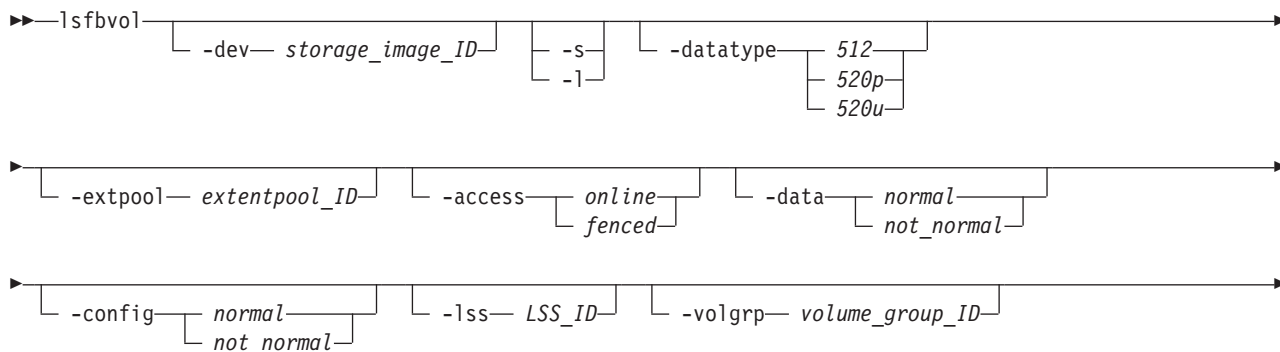
```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

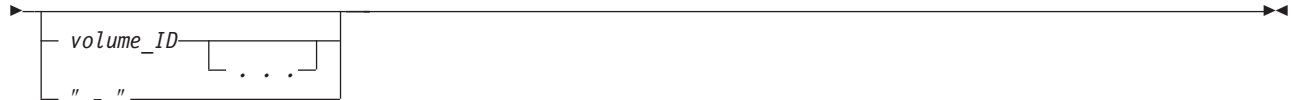
```
FB volume 0100 successfully modified.
```

```
FB volume 0101 successfully modified.
```

### lsfbvol

The **lsfbvol** command displays a list of fixed block volumes in a storage image and status information for each volume in the list.





## Parameters

**Note:** For a storage unit that is heavily configured, it is recommended that you specify the **-lss** or the **-volgrp** parameter as part of your command.

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number.

**-s** (Optional) Displays the volume IDs. You cannot use the **-l** and the **-s** parameters together.

**-l** (Optional) Displays default output plus additional attributes that are identified as long output. You cannot use the **-l** and the **-s** parameters together.

**-datatype** *512 | 520p | 520u*

(Optional) Displays volumes of the specified volume data type. Standard 2107/1750 volume (512), System i protected (520p), System i unprotected (520u).

**-extpool** *extentpool\_ID*

(Optional) Displays volumes that are sourced from the specified extent pool. An extent pool ID is a four-digit decimal number with no leading zeroes, prefixed with the letter P.

**-access** *online | fenced*

(Optional) Displays volumes with the specified access state.

**-data** *normal | not\_normal*

(Optional) Displays volumes with the specified data state.

**-config** *normal | not\_normal*

(Optional) Displays volumes with the specified configuration.

**-lss** *LSS\_ID*

(Optional) Displays volumes with IDs that contain the specified logical subsystem ID. Each logical subsystem can contain up to 256 volumes. A logical subsystem ID is two hexadecimal characters 00 - 1F (for 1750).

**-volgrp** *volume\_group\_ID*

(Optional) Displays volumes that are assigned to the specified volume group ID. A volume group ID is a four-digit decimal number, with no leading zeros, prefixed by the letter V. For example, V123.

*volume\_ID . . . | -*

(Optional) Displays volumes with the specified IDs. The volume ID is a 32 bit number that can be represented as 4 hexadecimal digits in the form of XYZZ where X is the address group (0 - 1), XY together is the logical subsystem number 00 - 1E, and ZZ is the volume number (00 - FF).

To specify a range of volume IDs, separate the volume IDs with a hyphen.

You must separate multiple volume IDs or ranges of volume IDs with a blank space between each ID or range of IDs.

If you use the dash (-), the specified value is read from standard input.

Example: 0100-010F 0180-018F 0120

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **lsfbvol** command using the **-l** parameter. A separate example is not shown for the 1750 because the information is the same for both machine types. The only difference is the machine type designation, 2107 versus 1750.

### Note:

### Invoking the lsfbvol command

```
dscli>lsfbvol
-dev IBM.2107-75FA120 -l -volgrp V2
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

| Name                   | ID   | accstate | datastate | config state | device MTM | data type |
|------------------------|------|----------|-----------|--------------|------------|-----------|
| My_<br>volume_<br>0001 | 0100 | Online   | Normal    | Normal       | 2107-900   | FB 512    |
| My_<br>volume_<br>0002 | 0102 | Online   | Normal    | Normal       | 2107-A07   | FB 520P   |
| My_<br>_volume<br>0003 | 0103 | Online   | Normal    | Normal       | 2107-900   | FB 512    |

| extpool | sam      | captype | cap (2^30B) | cap (10^9B) | cap (blocks) | Volgrp |
|---------|----------|---------|-------------|-------------|--------------|--------|
| P21     | standard | DS      | 64.0        | -           | 134217728    | V2     |
| P31     | standard | iSeries | 128.0       | 68.7        | 268435456    | V2     |
| P21     | standard | ESS     | -           | 35.0        | 68359424     | -      |

## Report field definitions

**Name** Identifies the nickname that you assigned for the specified volume object.

**ID** Identifies the unique identifier that is assigned to this volume object.

### Accstate

One of the following access states are displayed: Online or Fenced.

#### Online

The logical volume is accessible to a host.

#### Fenced

The logical volume is in the volume fenced state and is not accessible to the host.

### Datastate

One of the following data states are displayed:

### **Normal**

Specifies that none of the other data states apply. The access state is Online.

### **Read only**

Indicates that the logical volume is read only because one or more extents on the logical volume are on a rank in the read only data state. The access state is Online.

### **Inaccessible**

Indicates that one or more extents that are associated with the logical volume are on a rank that is in the inaccessible data state. The access state is fenced.

### **Indeterminate data loss**

Specifies that the following data states do not apply and that one of the following conditions has occurred:

Data states that do not apply:

- Rank failed
- Rank repairing
- Rank repaired
- Global inaccessible
- Global lost data

Conditions - one of the following occurred:

- Committed write data was lost before it was destaged and the track identifiers that are associated with the data are unknown.
- Data has been lost that indicates that extents on the logical volume were active FlashCopy targets.

The access state is fenced.

### **Rank failed**

Indicates that one or more extents that are associated with the logical volume are on a rank that is in the Failed data state. The access state is Fenced. This data state transitions to the Rank repairing state if the rank transitions to the Rank repairing state through use of the repair array function.

### **Rank Repairing**

Indicates that one or more extents that are associated with the logical volume are on ranks in the repairing data state. The access state is fenced.

### **Rank Repaired**

Indicates that one or more extents that are associated with the logical volume are on ranks that were in the repairing state, but are not in the repairing state now. The access state is fenced.

### **Global inaccessible**

Specifies that the global metadata that is associated with the logical volume configuration is inaccessible. Some of the data associated with the logical volume might be inaccurate. The access state is fenced.

### **Global lost data**

Specifies that global metadata that is associated with the logical volume configuration has been lost. As a result, some of the data associated with the logical volume might be inaccurate. The access state is fenced.

### **NVS data inaccessible**

Specifies that active NVS data is inaccessible for one or more logical volumes of an LSS group. The logical volumes in the LSS group cannot be made accessible. The access state is fenced.

### **Configstate**

One of the following configuration states are displayed:

#### **Normal**

Indicates that there are no logical volume configuration operations in progress.

#### **Configuring**

Indicates that the logical volume is in the process of being configured for the first time.

#### **Reconfiguring**

Indicates that the logical volume is in the process of allocating or deallocating extents due to a modification of the requested capacity attribute after initial creation.

#### **Migrating**

Indicates that the logical volume is in the process of performing dynamic volume relocation to a specified extent pool.

#### **Deconfiguring**

Indicates that the logical volume is in the process of being deleted.

#### **Configuration error**

Indicates that the initial configuration did not complete successfully. This state reflects an internal error condition and not an error in the request to create the volume.

**Corrective action:** Use the **rmfbvol** command to delete each volume listed with the configuration state of "configuration error".

#### **Reconfiguration error**

Indicates that the reconfiguration request did not complete successfully.

#### **Migration error**

Indicates that the dynamic volume relocation operation was ended during processing.

#### **Deconfiguration error**

Indicates that a request to delete a volume did not complete successfully. This state reflects an internal error condition and not an error in the request to remove the volume. To correct this state, you must reissue the **rmfbvol** command for the designated volume.

### **deviceMTM**

Indicates the volume device type and model. The volume MTM (machine type, model) is determined by the fixed block volume data type and the volume capacity (in GB). The machine type is either 2107 or 1750; however, the MTM can be any one of the following depending on your system:

#### **2107-900**

Indicates a standard 2107 volume.

#### **1750-500**

Indicates a standard 1750 volume.



xxxx-A0x

Indicates that the xxxx is a 2107 or 1750. The A0 indicates a System i protected volume (for example, 2107-A01 or 1750-A07).

xxxx-A8x

Indicates that the xxxx is 2107 or 1750. The A8 indicates a System i unprotected volume (for example, 2107-A81 or 1750-A87).

#### **Datatype**

Indicates the volume data type setting. One of the following binary (B) values will be displayed:

- FB 512
- FB 520P
- FB 520U

#### **Extpool**

Identifies the extent pool ID. Volume extents are allocated from this extent pool ID.

#### **Capttype**

Indicates the capacity unit type that is used at volume creation. One of the following values is displayed:

##### **ESS**

The capacity unit is 10<sup>9</sup>B.

##### **DS**

The capacity unit is 2<sup>30</sup>B.

##### **DS/ESS**

The capacity unit is 2<sup>30</sup>B or 10<sup>9</sup>B.

##### **Blocks**

The capacity unit is 512B.

##### **iSeries**

The capacity unit was not specified at volume creation. This fixed block volume was created only for iSeries.

#### **Cap (2<sup>30</sup>B)**

Specifies the size of the volume that is available for host system access in 2<sup>30</sup>B (binary GB) units.

**Note:** "-" (null) is displayed if the capacity unit type of the volume is ESS (capttype=ESS)

#### **Cap (10<sup>9</sup>B)**

Specifies the size of the volume that is available for host system access in 10<sup>9</sup>B (decimal GB) units.

**Note:** "-" (null) is displayed if the capacity unit type of the volume is DS (capttype=DS)

#### **Cap (blocks)**

Indicates the quantity of volume logical blocks that are available for host system access.

#### **Volgrp**

Specifies the volume groups (excluding default volume groups) that a volume belongs to.

| Multiple volume groups that are associated with the volume are separated  
 | by a comma.  
 |  
 | A null (-) is displayed if there are no volume groups that are associated  
 | with the volume.

### mkfbvol

The **mkfbvol** command creates open systems fixed block (FB) volumes in a storage image.



### Parameters

#### Notes:

1. You can create multiple volumes with one command; however, all volumes must have the same capacity, extent pool, and data type.
2. If host attachment volume groups have not yet been created, create temporary volume groups and assign new fixed block volumes to the temporary volume groups according to the volume type and capacity characteristics.

| **-dev** *storage\_image\_ID*  
 | (Optional) Specifies the storage image ID, which includes a value for the  
 | manufacturer, machine type, and serial number.  
 |  
 | **-extpool** *extentpool\_ID*  
 | (Required) Creates the base or alias volumes from data extents that are  
 | contained in this extent pool. The extent pool storage type defines the volume  
 | storage type. An extent pool ID is a four-digit decimal number with no leading  
 | zeros, prefixed with the letter *P*.  
 |  
 | **-os400** A01 | A81 | A02 | A82 | A04 | A84 | A05 | A85 | A06 | A86 | A07 |  
 | A87  
 | (Optional) The OS 400 volume options.  
 | This parameter is required if capacity is not specified.

The storage sizes and the data types for this volume:

- A01 - 8.6 GB, protected
- A81 - 8.6 GB, unprotected
- A02 - 17.5 GB, protected
- A82 - 17.5 GB, unprotected
- A04 - 70.5 GB, protected
- A84 - 70.5 GB, unprotected
- A05 - 35.1 GB, protected
- A85 - 35.1 GB, unprotected
- A06 - 141.12 GB, protected
- A86 - 141.12 GB, unprotected
- A07 - 282.25 GB, protected
- A87 - 282.25 GB, unprotected

GB is  $10^9$  bytes.

**Note:** You must ensure that the volume data type is compatible with the host systems that can access this volume.

**-type** *ess | ds | blocks*

(Optional) Specifies the unit type of capacity that is specified by the **-cap** parameter.

**ess:** Specifies that the unit is  $10^9$  bytes.

**ds:** Specifies that the unit is  $2^{30}$  bytes.

**blocks:** Specifies that the unit is 512 blocks.

**Notes:**

1. If the **-type** parameter is not specified, the lun is created as type **ds**.
2. The **-type** parameter is ignored when the **-os400** parameter is specified.

**-cap** *capacity*

(Optional) Specifies the storage size that is allocated to this volume object.

**Note:** This parameter is required if the **-os400** parameter is not specified.

If the **-type** parameter is omitted or the **-type ds** parameter is specified:

- 1GB = 1 073 741 824 ( $2^{30}$  bytes)
- Supported storage sizes range from 1 to 2048.

If the **-type ess** parameter is specified:

- capacity = X.Y or X
  - where X is whole gigabytes, with 1 GB=1 000 000 000 ( $10^9$  bytes).
  - where Y represents a fraction of 1 GB. Y is limited to a single digit (0-9) to the right of the decimal.
- Supported storage sizes range from 0.1 - 982.2 (0.1 increment).

If the **-type blocks** parameter is specified, *capacity* is the number of 512 blocks. Supported storage sizes are from 1 to 4294967296 ( $4 \times 2^{30}$  bytes).

**-name** *volume\_name*

(Optional) Your nickname for this volume. The nickname can be 16 characters long, and it can contain one of the following wildcard characters:

- (#d) decimal volume ID
- s
- (#h) hexadecimal volume ID

**-volgrp** *volume\_group\_ID*

(Optional) Specifies to which volume group the volumes are assigned. A volume group ID is a four-digit decimal number with no leading zeros, prefixed with the letter V.

**-wait**

(Optional) Delays the command response until the volume configuration processes complete.

**Note:** If you specify this parameter, you must wait until your original command processes completely before you can issue a new command.

*volume\_ID* . . . | -

(Required) An array of one or more fixed block volume IDs to be created. The volumes must share a common logical subsystem ID.

The volume ID is a 32-bit number that can be represented as four hexadecimal digits in the form of XYZZ, where X is the address group (0 - 1), XY is the logical subsystem number 00 - 1E (for 1750) , and ZZ is the volume number (00 - FF).

To specify a range of volume IDs, separate the volume IDs with a dash (-).

You must separate multiple volume IDs or ranges of volume IDs with a blank space between each ID or range of IDs.

Example: 0100-010F 0180-018F 0120

If you use the dash (-), the specified value is read from standard input. However, you cannot use the dash (-) while you are in the DS CLI interactive command mode.

## Example (1750)

### Invoking the mkfbvol command

```
dscli>mkfbvol -dev IBM.1750-68FA120
-extpool P1 -name my_vol_#d -type ess
-cap 8.6 0100 0101 0102 0103
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Device: IBM.1750-68FA120

```
FB volume 0100 successfully created.
FB volume 0101 successfully created.
FB volume 0102 successfully created.
FB volume 0103 successfully created.
```

### rmfbvol

The **rmfbvol** command deletes fixed block volumes from a storage image.

```

>>rmfbvol- -dev- storage_image_ID- -quiet- -safe- volume_ID- . . .
" _ "

```

## Parameters

**Note:** You can use this command when there are volumes that are in the configuration error state. To correct this configuration state, issue the **rmfbvol** command for each affected volume. You can specify a volume range according to the command specifications when it is appropriate.

### **-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified volume ID for all logical volumes and you do not specify a value for the *dev*id variable in your profile file.

### **-quiet**

(Optional) Turns off the confirmation prompt for this command.

### **-safe**

(Optional) Specifies that the system perform a check to see if the specified volumes are assigned to any user-defined volume group. If any volumes are still assigned to a user-defined volume group, the **rmfbvol** command fails without deleting any volumes. When this occurs, messages are provided that list the volumes that are still assigned to a user-defined volume group.

**Note:** If there is any reason that the system cannot perform the check, the **rmfbvol** command fails and no volumes are deleted.

### *volume\_ID* . . . | -

(Required) Specifies an array of one or more fixed block volume IDs to be removed. This parameter also accepts a fully qualified volume ID, which includes the storage image ID, or a shortened version without the storage image ID if the **-dev** parameter is specified.

#### **Example of -dev parameter use**

If you specify the **-dev** parameter, you can use the shortened version of the *Volume\_ID* parameter as follows:

```
dscli>rmfbvol -dev IBM.1750-13ABR4A 0005-00FF
```

If you do not specify the **-dev** parameter and you specify the *volume\_ID* parameter, you must use the fully qualified version of the volume ID as follows:

```
dscli>rmfbvol IBM.1750-13ABR4A/0005-00FF
```

The volume ID is a 32 bit number that can be represented as 4 hexadecimal digits in the form of XYZZ where X is the address group (0 - 1), XY together is the logical subsystem number 00 - 1E (for 1750) , and ZZ is the volume number (00 - FF).

To specify a range of volume IDs, separate the volume IDs with a hyphen.

You must separate multiple volume IDs or ranges of volume IDs with a blank space between each ID or range of IDs.

If you use the dash (-), the specified value is read from standard input.

## Example (1750)

### Invoking the rmfbvol command

```
dscli>rmfbvol -dev IBM.1750-68FA120 0100 0101
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DSCLI Version: 5.0.0.0 DS: IBM.1750-68FA120

Are you sure you want to delete 0100? y/n Y  
Volume 0100 successfully deleted.  
Are you sure you want to delete 0101? y/n Y  
Volume 0101 successfully deleted.

**The following is an example of the output that results when you specify that you want a range of volume IDs to be removed.**

### Invoking the rmfbvol command

```
dscli>rmfbvol -dev IBM.1750-13ABR4A 0005-00FF
```

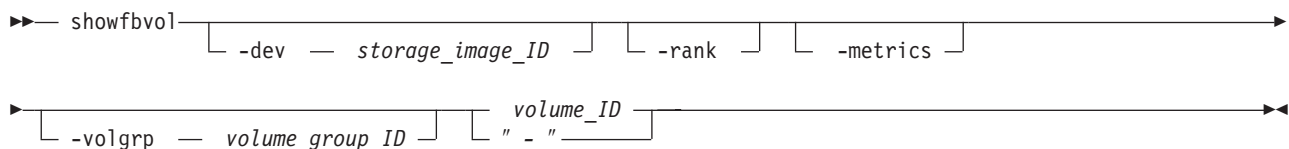
Date/Time: September 13, 2005 9:38:52 PM MST IBM DS CLI Version: 5.0.0.0  
DS: IBM.1750-13ABR4A

CMUC00027W rmfbvol: Are you sure you want to delete FB volume 0005-00FF?  
[y/n]:y

CMUC00028I rmfbvol: FB volume 0005 successfully deleted.  
CMUC00028I rmfbvol: FB volume 0006 successfully deleted.  
CMUC00028I rmfbvol: FB volume 0007 successfully deleted.  
CMUC00028I rmfbvol: FB volume 0008 successfully deleted.  
CMUC00028I rmfbvol: FB volume 0009 successfully deleted.  
CMUC00028I rmfbvol: FB volume 000A successfully deleted.  
CMUC00028I rmfbvol: FB volume 000B successfully deleted.  
CMUC00028I rmfbvol: FB volume 000C successfully deleted.  
CMUC00028I rmfbvol: FB volume 000D successfully deleted.  
CMUC00028I rmfbvol: FB volume 000E successfully deleted.  
CMUC00028I rmfbvol: FB volume 000F successfully deleted.  
CMUC00028I rmfbvol: FB volume 0010 successfully deleted.  
CMUC00028I rmfbvol: FB volume 0011 successfully deleted.  
CMUC00028I rmfbvol: FB volume 0012 successfully deleted.  
CMUC00028I rmfbvol: FB volume 0013 successfully deleted.  
CMUC00028I rmfbvol: FB volume 0014 successfully deleted.  
CMUC00028I rmfbvol: FB volume 0015 successfully deleted.  
CMUC00028I rmfbvol: FB volume 0016 successfully deleted.  
CMUC00028I rmfbvol: FB volume 0017 successfully deleted.  
CMUC00028I rmfbvol: FB volume 0018 successfully deleted.  
CMUC00028I rmfbvol: FB volume 0019 successfully deleted.  
CMUC00028I rmfbvol: FB volume 001A successfully deleted.  
CMUC00028I rmfbvol: FB volume 001B successfully deleted.  
CMUC00028I rmfbvol: FB volume 001C successfully deleted.  
CMUC00028I rmfbvol: FB volume 001D successfully deleted.  
CMUC00028I rmfbvol: FB volume 001E successfully deleted.  
CMUC00028I rmfbvol: FB volume 001F successfully deleted.  
CMUC00028I rmfbvol: FB volume 0020 successfully deleted.  
CMUC00028I rmfbvol: FB volume 0021 successfully deleted.  
CMUC00028I rmfbvol: FB volume 0022 successfully deleted.  
CMUC00028I rmfbvol: FB volume 0023 successfully deleted.  
CMUC00028I rmfbvol: FB volume 0024 successfully deleted.

### showfbvol

The **showfbvol** command displays detailed properties for an individual volume. This command can also be used to display the performance metrics of a fixed block volume.



## Parameters

### **-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which consists of the manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the logical volume.

### **-rank**

(Optional) Specifies that a rank extents table be displayed. This table displays the set of ranks that the logical volume has extents configured on and the number of extents for that logical volume.

**Note:** This parameter cannot be used with the **-metrics** or **-volgrp** parameters.

### **-metrics**

(Optional) Displays volume ID and performance metrics for the specified volume.

#### Notes:

1. All performance counts are an accumulation since the most recent counter wrap or counter reset. Volume performance counters are reset on a power-up sequence. Volume performance counters are reset by a server failover and failback sequence.
2. Do not use this parameter with the **-rank** or **-volgrp** parameters.

### **-volgrp** *volume\_group\_ID*

(Required if you do not specify the *volume\_ID* parameter.) Specifies that the fixed block volumes that are associated with the designated volume group ID be displayed.

#### Notes:

1. You can only use the **-volgrp** parameter when you are doing a query for performance metrics.
2. Do not use the **-volgrp** parameter with the *volume\_ID* parameter.
3. Do not use the **-volgrp** parameter with the **-rank** or **-metrics** parameters.

### *volume\_ID* | -

(Required if you do not specify the **-volgrp** parameter.) Displays information for the specified volume. This parameter accepts a fully qualified volume ID, which consists of the *storage\_image\_ID* or a shortened version without the storage image ID, if you specify the **-dev** parameter. The volume ID is a 32 bit number that can be represented as 4 hexadecimal digits in the form of XYZZ where X is the address group (0 - 1), XY together is the logical subsystem number 00 - 1E, and ZZ is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input. However, you cannot use the dash (-) while you are in the DS CLI interactive command mode.

**Note:** Do not use the *volume\_ID* parameter with the **-volgrp** parameter.

## Example

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output reports that are associated with the **showfbvol** command using the **-rank** parameter. When the rank parameter is specified, a rank extents table is also displayed. It appears at the end of the regular report.

A separate example is not shown for the 1750 because the information is the same for both. The only difference is the machine type designation, 2107 versus 1750.

### Invoking the showfbvol to show volume properties

**Note:** The example output is based on using the **showfbvol** command for a 1.0 (Binary) GB volume.

```
dscli>showfbvol
-dev IBM.2107-1300861 -rank 6000
```

### The resulting output

Date/Time: April 13, 2005 2:38:14 PM JST IBM DS CLI Version: 5.0.3.40 DS: IBM.2107-1300861

| Name                   | ID   | acc state | data state | config state | device MTM | data type | addrgrp |
|------------------------|------|-----------|------------|--------------|------------|-----------|---------|
| My_<br>volume<br>_6000 | 6000 | Online    | Normal     | Normal       | 2107-900   | FB 512    | 6       |

| Rank | Extents |
|------|---------|
| R0   | 1       |
| R2   | 2       |

### Report field definitions ( *-metrics* parameter not specified)

#### Name

Specifies the nickname that you assigned for this volume object.

**ID** Specifies the unique identifier that is assigned to this volume object.

#### Accstate

One of the following access states are displayed: Online or Fenced.

##### Online

The logical volume is accessible to a host.

##### Fenced

The logical volume is in the volume fenced state and is not accessible to the host.

#### Datastate

One of the following data states are displayed:

##### Normal

None of the other data states apply. The access state is Online.

##### Pinned

Specifies that none of the other data states apply and the logical volume has one or more pinned non-retryable tracks. The access state is Online.



### **Read only**

Indicates that the logical volume can be read but not written to because one or more extents on the logical volume are on a rank in the read only data state. The access state is Online.

### **Inaccessible**

Indicates that one or more extents that are associated with the logical volume are on a rank that is in the inaccessible data state. The access state is Fenced.

### **Indeterminate data loss**

Specifies that the following data states do not apply and that one of the following conditions has occurred:

Data states that do not apply:

- Rank failed
- Rank repairing
- Rank repaired
- Global inaccessible
- Global lost data

Conditions - one of the following conditions has occurred:

- Committed write data was lost before it was destaged and the track identifiers that are associated with the data are unknown.
- Data was lost that indicated extents on the logical volume were active FlashCopy targets.

The access state is Fenced.

### **Rank failed**

Indicates that one or more extents that are associated with the logical volume are on a rank that is in the Failed data state. The access state is Fenced. This data state changes to Rank repairing if the rank changes to the Rank repairing state through use of the repair array function.

### **Rank Repairing**

Indicates that one or more extents that are associated with the logical volume are on ranks in the repairing data state. The access state is Fenced.

### **Rank Repaired**

Indicates that one or more extents that are associated with the logical volume are on ranks that were in the repairing state, but are not in the repairing state now. The access state is Fenced.

### **Global inaccessible**

Specifies that the global metadata that is associated with the logical volume configuration is inaccessible. Some of the data that is associated with the logical volume might be inaccurate. The access state is Fenced.

### **Global lost**

Specifies that global metadata that is associated with the logical volume configuration has been lost. As a result, some of the data that is associated with the logical volume might be inaccurate. The access state is Fenced.

### **NVS data inaccessible**

Specifies that active nonvolatile storage (NVS) data is inaccessible for one or more logical volumes of an LSS group. The logical volumes in the LSS group cannot be made accessible. The access state is Fenced.

## Configstate

One of the following configuration states are displayed:

### Normal

Indicates that there are no logical volume configuration operations in progress.

### Configuring

Indicates that the logical volume is in the process of being configured for the first time.

### Reconfiguring

Indicates that the logical volume is in the process of allocating or deallocating extents due to a modification of the requested capacity attribute after initial creation.

### Migrating

Indicates that the logical volume is in the process of performing dynamic volume relocation to a specified extent pool.

### Deconfiguring

Indicates that the logical volume is in the process of being deleted.

### Configuration error

Indicates that the initial configuration did not complete successfully. This state reflects an internal error condition and not an error in the request to create the volume.

**Corrective action:** Use the **rmfbvol** command to delete each volume listed with the configuration state of "configuration error".

### Reconfiguration error

Indicates that the reconfiguration request did not complete successfully.

### Migration error

Indicates that the dynamic volume relocation operation was ended during processing.

### Deconfiguration error

Indicates that a request to delete a volume did not complete successfully. This state reflects an internal error condition and not an error in the request to remove the volume. To correct this state, you must reissue the **rmfbvol** command for the designated volume.

## deviceMTM

Indicates the volume device type and the machine type. The volume MTM is determined by the fixed block volume data type and the volume capacity (in GB). The machine type is either 2107 or 1750; however, the MTM can be any one of the following depending on your system:

### 2107-900

This indicates a standard 2107 volume.

### 1750-500

This indicates a standard 1750 volume.

### xxxx-A0x

The *xxxx* is 2107 or 1750; the A0 indicates a System i protected volume (for example, 2107-A01 or 1750-A07).

### xxxx-A8x

The *xxxx* is 2107 or 1750; the A8 indicates a System i unprotected volume (for example, 2107-A81 or 1750-A87).

**Datatype**

Indicates the volume data type setting. One of the following values is displayed:

- FB 512
- FB 520P
- FB 520U

**Addrgrp**

Specifies the address group that contains the designated volume object. An address group ID is one hexadecimal character ( 0 - F ).

**Extpool**

Specifies the extent pool ID. Volume extents are allocated from this extent pool ID.

**Exts**

Specifies the number of extents used by the designated volume ID.

**Capttype**

Indicates capacity unit type used at volume creation. One of the following values is displayed:

**ESS**

The capacity unit is  $10^9$ B.

**DS**

The capacity unit is  $2^{30}$ B.

**DS/ESS**

The capacity unit is  $2^{30}$ B or  $10^9$ B.

**Blocks**

The capacity unit 512B.

**iSeries**

The capacity unit was not specified at volume creation. This fixed block volume was created for iSeries.

**Cap (  $2^{30}$ B )**

Specifies the size of volume that is available for host system access in  $2^{30}$ B (binary GB) unit.

**Note:** "-" (null) is displayed if the capacity unit type of the volume is ESS (capttype=ESS)

**Cap (  $10^9$ B )**

Specifies the size of volume that is available for host system access in  $10^9$ B (decimal GB) unit.

**Note:** "-" (null) is displayed if the capacity unit type of the volume is DS (capttype=DS)

**Cap blocks**

Indicates the quantity of volume logical blocks that are available for host system access.

**Volgrp**

Specifies the volume groups (excluding default volume groups) that a volume belongs to.

Multiple volume groups that are associated with the volume are separated by a comma.

A null (-) is displayed if there are no volume groups that are associated with the volume.

### Ranks

Specifies the number of ranks that the volume resides on.

### Rank (Rank Extent table)

Specifies the rank ID.

### Extents (Rank Extents table)

Specifies the number of extents for the volume on the rank.

## Example

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output reports that are associated with the **showfbvol** command using the **-metrics** parameter.

### Invoking the showfbvol to show performance metrics

```
dscli>showfbvol -metrics IBM.2107-75FA120/0101
```

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI  
Version: 5.0.0.0 DS: IBM.2107-75FA120

| ID                                | Date                     | norm<br>rdrqts | norm<br>rdhits | norm<br>write<br>req | norm<br>write<br>hits | seq<br>read<br>reqs | seq<br>read<br>hits | seq<br>write<br>req |
|-----------------------------------|--------------------------|----------------|----------------|----------------------|-----------------------|---------------------|---------------------|---------------------|
| IBM.<br>2107-<br>75FA120<br>/0101 | 10/11<br>/04<br>02:23:49 | 10000          | 10000          | 10000                | 10000                 | 10000               | 10000               | 10000               |

| seqwrite-<br>hits | cachfwr-<br>reqs | cachfwr-<br>hits | cachfwr-<br>reqs | cachfwr-<br>hits | inbcach-<br>load | bypass-<br>cach | seq<br>DASD<br>trans |
|-------------------|------------------|------------------|------------------|------------------|------------------|-----------------|----------------------|
| 10000             | 10000            | 10000            | 10000            | 10000            | 10000            | 10000           | 10000                |

| DASD-<br>trans | cache-<br>trans | NVS-<br>spadel | norm<br>write<br>ops | seqwrite-<br>ops | rec<br>cache<br>mis | qwrite-<br>prots | CKDir-<br>trkac |
|----------------|-----------------|----------------|----------------------|------------------|---------------------|------------------|-----------------|
| 10000          | 10000           | 10000          | 10000                | 10000            | 10000               | 10000            | 10000           |

| CKD<br>irtrk<br>hits | cachsp-<br>delay | timelow-<br>ifact | phread | phwrite | phwrite | phbyte-<br>read | phbyte-<br>writ |
|----------------------|------------------|-------------------|--------|---------|---------|-----------------|-----------------|
| 10000                | 10000            | 10000             | 10000  | 10000   | 10000   | 10000           | 10000           |

| recmo-reads | sfile trk reads | contam-wrts | PPRC-trks | NVS-spallo | time-phread | timeph-write | byte-read |
|-------------|-----------------|-------------|-----------|------------|-------------|--------------|-----------|
| 10000       | 10000           | 10000       | 10000     | 10000      | 10000       | 10000        | 10000     |

| bytewrit | timeread | timewrite |
|----------|----------|-----------|
| 10000    | 10000    | 10000     |

## Report field definitions ( *-metrics* parameter specified)

**ID** Specifies the unique identifier that is assigned to this volume object.

### Date

Specifies the current time stamp for the volume performance counters.

### normrdqrts

Specifies Search/Read Normal I/O Requests.

### normrdhits

Specifies Search/Read Normal I/O Requests instances.

### normwritereq

Specifies Write Normal I/O Requests.

### normwritehits

Specifies DASD Fast Write I/O Request instances.

### seqreadreqs

Specifies Search/Read Sequential I/O Requests.

### seqreadhits

Specifies Search/Read Sequential I/O Request instances.

### seqwritereq

Specifies Write Sequential I/O Requests.

### seqwritehits

Specifies DASD Fast Write Sequential I/O Request instances.

### cachfwrreqs

Specifies Search/Read Cache Fast Write I/O Requests.

### cachfwrhits

Specifies Search/Read Cache Fast Write I/O Request instances.

### cachfwreqs

Specifies Cache Fast Write I/O Requests.

### cachfwhits

Specifies Cache Fast Write I/O Requests instances.

### inbcachload

Specifies Inhibit Cache Loading I/O Requests that operate with DASD.

### bypasscach

Specifies Bypass Cache I/O Requests.

### seqDASDtrans

Specifies Sequential DASD to Cache Transfer Operations.

### DASDtrans

Specifies DASD to Cache Transfer Operation Count.

**cachetrans**  
Specifies Cache to DASD Transfer Operation Count.

**NVSspadel**  
Specifies DASD Fast Write Operations Delayed Due to nonvolatile storage Space Constraints.

**normwriteops**  
Specifies Normal 'DASD Fast Write' Write Operation Counts.

**seqwriteops**  
Specifies Sequential Access 'DASD Fast Write' Write Operation Counts.

**reccachemis**  
Specifies Number of record cache Read Misses.

**qwriteprots**  
Specifies Quick Write Promotes.

**CKDirtrkac**  
Specifies Irregular Track Accesses.

**CKDirtrkhits**  
Specifies Irregular Track Accesses instances.

**cachspdelay**  
Specifies Operations Delayed Due To Cache Space Constraints.

**timelowifact**  
Specifies Milliseconds of lower interface I/O activity for the indicated device.

**phread**  
Specifies Physical Storage Read Operations.

**phwrite**  
Specifies Physical Storage Write Operations.

**phbyteread**  
Specifies Physical Storage Bytes Read in 128 KB increments.

**phbytewrit**  
Specifies Physical Storage Bytes Written in 128 KB increments.

**recmoreads**  
Specifies Record Mode Read Operations.

**sfiletrkreads**  
Specifies the Number of tracks read from the Concurrent Copy or XRC Sidefile.

**contamwrts**  
Specifies the Number of Contaminating writes for a Concurrent Copy or XRC volume.

**PPRCtrks**  
Specifies the Number of tracks or portion of tracks that were transferred to the secondary device of a PPRC pair.

**NVSspallo**  
Specifies the NVS Space Allocations.

**timephread**  
Specifies the Physical Storage Read Response Time in 16 ms increments.

**timephwrite**  
Specifies the Physical Storage Write Response Time in 16 ms increments.

**byteread**

Specifies the number of Bytes read in 128 KB increments.

**bytewrit**

Specifies the number of Bytes written in 128 KB increments.

**timeread**

Specifies the accumulated response time for all read operations.

**timewrite**

Specifies the accumulated response time for all write operations.

## Volume group specific commands

This section contains commands that are used to create, modify, and delete volume groups and to display volume group information.

Use the following commands to create, modify, and delete volume groups and to display volume group information:

- **chvolgrp**
- **lsvolgrp**
- **mkvolgrp**
- **rmvolgrp**
- **showvolgrp**

The **chvolgrp** command modifies a volume group name and volume members.

The **lsvolgrp** command generates a report that displays a list of volume groups in a storage unit and the status information for each volume group in the list.

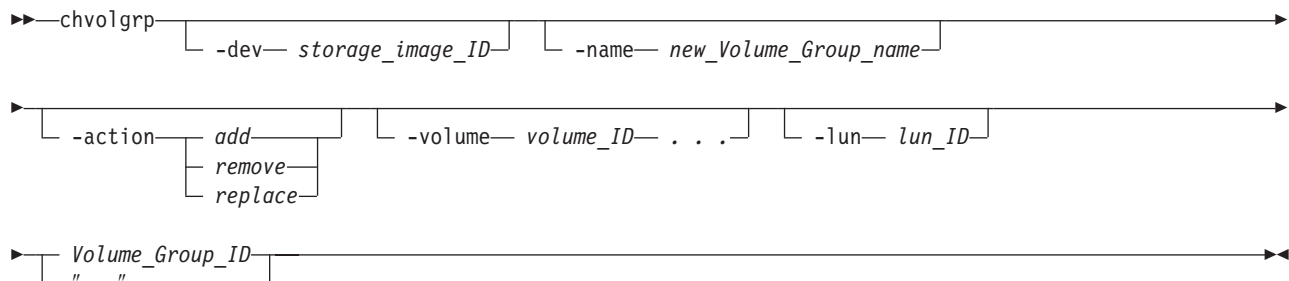
The **mkvolgrp** command creates a volume group in a storage unit.

The **rmvolgrp** command deletes the specified volume group or volume groups from a storage unit.

The **showvolgrp** command generates a report that displays the detailed properties of a volume group.

**chvolgrp**

The **chvolgrp** command modifies a volume group name and volume members.

**Parameters**

**Note:** If you are using an HP-UX operating systems, the number of volumes in the volume group must not exceed 7 volumes. This restriction only applies

when the **hostconnect** attribute for the **-addrdiscovery** parameter is set to **reportlun** and the associated volume group is of type **mapscsi256**.

**-dev** *storage\_image\_ID*

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the volume group ID.

Example: IBM.1750-68FA120

**-name** *new\_Volume\_Group\_name*

(Optional). Specifies a new name for the volume group. The name is limited to 16 characters. The name must be unique across volume groups that are contained by a storage unit.

**-action** *add | remove | replace*

(Optional, unless the **-volume** parameter is specified). Specify one of the following values with this parameter:

**add** Specifies that the volumes be added to the volume group.

**remove**  
Specifies that the volumes be removed from the volume group.

**replace**  
Specifies that the existing volumes be replaced by the specified volumes.

**Note:** The **chvolgrp** command fails if you have specified the **-volume** parameter and not included the **-action** parameter.

**-volume** *volume\_ID . . .*

(Optional unless you are specifying the **-action** or the **-lun** parameter, then the **-volume** parameter is required.) Specifies an array of one or more volume IDs or volume ID ranges to be included in the volume group when the **-action** parameter is specified.

The volume ID is a 32 bit number that can be represented as 4 hexadecimal digits in the form of XYZZ where X is the address group (0 - 1), XY together is the logical subsystem number 00 - 1E (for 1750) , and ZZ is the volume number (00 - FF).

To specify a range of volume IDs, separate the volume IDs with a dash (-).

You must separate multiple volume IDs or ranges of volume IDs with a comma between each ID or range of IDs.

**Notes:**

1. For SCSI MAP 256, the array or ranges cannot exceed 256 volume ID entries. Otherwise, up to 64 384 entries are allowed.
2. The **chvolgrp** command fails if you specify the **-volume** parameter and do not specify the **-action** parameter.

Example: 0100-010F,0180-018F,0120

**-lun** *lun\_ID*

(Optional - SCSI MAP 256 only). Specifies the LUN ID in hexadecimal value (00 - FF), which is mapped to the specified volume ID when the **-action add** or **-action replace** parameter is specified. If multiple volume IDs are specified by the **-volume** parameter, the LUN ID is consecutively assigned in incremental order. If the specified LUN ID is not valid, the command is rejected.



**Note:** This parameter is only valid when the target volume group type is SCSI MAP 256. Otherwise, this command fails.

If the **-action add** parameter is specified and the specified LUN ID is already mapped to the other volume in the specified volume group, the command fails.

If the **-action add** parameter is specified without the **-lun** parameter, an unused LUN ID is assigned to the volume ID. In this case, the unused LUN ID is selected from a smaller number.

The following example shows how this works:

A volume group of "SCSI Map 256" type has Volume 0000 and 0001. Their LUNs are the members of the following volume group:

(showvolgrp displays the current mapping.)

0000 : 10

0001 : 11

Because the range of LUN IDs is 00-FF, the unused LUN IDs are 00,01,...,0F,12,13,...,FF.

If you add volume 0002 and 0003 to this volume group without the **-lun** parameter, the mapping results in the following because 00 and 01 are "smaller" unused LUN IDs:

0002 : 00

0003 : 01

0000 : 10

0001 : 11

If the **-action replace** parameter is specified without specifying the **-lun** parameter, **lun\_ID=00** is assumed.

**Volume\_Group\_ID** | -

(Required). Specifies the ID of the volume group being changed. The volume group ID is made up of the storage image ID followed by the volume group ID. This parameter also accepts a fully qualified volume group ID including the storage image ID or a shortened version. The shortened version is a four-digit decimal number with no leading zeroes, prefixed with the letter V.

If you use the dash (-), the specified value is read from standard input.

Example: IBM.1750-68FA1243/V1231

## Example (1750)

### Invoking the chvolgrp command

```
dscli>chvolgrp -volume 0000-000F IBM.1750-68FA120/V2341
```

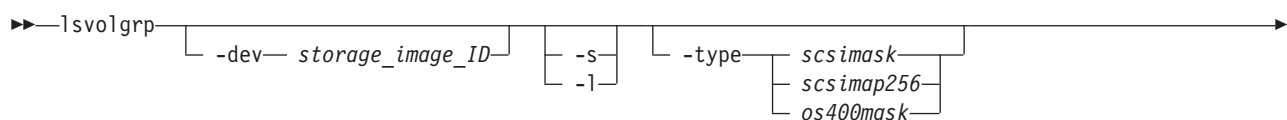
### The resulting output

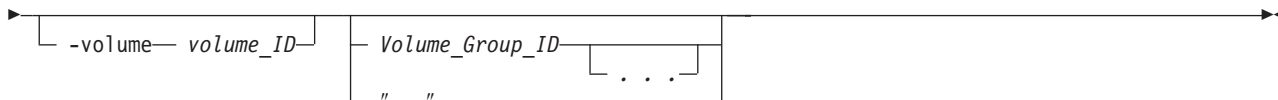
```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

```
Volume group V2341 successfully modified.
```

## lsvolgrp

The **lsvolgrp** command displays a list of volume groups in a storage image and status information for each volume group in the list.





## Parameters

**-dev** *storage\_image\_ID*

(Optional). Specifies the storage image ID, which includes manufacturer, machine type, and serial number. Displays only the objects for the storage unit that is specified. This parameter is required if you do not specify a fully qualified volume group ID and you do not specify a value for the *dev* variable in your profile file.

Example: IBM.1750-68FA120

**-s** (Optional). Displays volume group IDs only. You cannot use the **-l** and the **-s** parameters together.

**-l** (Optional). Displays the default output plus users. You cannot use the **-l** and the **-s** parameters together.

**-type** | *scsimask* | *scsimap256* | *os400mask*

(Optional). Displays only volume groups that are configured as the specified volume group type.

**-volume** *volume\_ID*

(Optional). Displays volume groups that contain the specified volume ID. The volume ID is a 32 bit number that can be represented as 4 hexadecimal digits in the form of *XYZZ* where *X* is the address group (0 - 1), *XY* together is the logical subsystem number 00 - 1E (for 1750) , and *ZZ* is the volume number (00 - FF).

*Volume\_Group\_ID . . .* | **-**

(Optional). Displays volume groups with the specified IDs. A volume group ID is a four-digit decimal number with no leading zeroes, prefixed with the letter *V*.

This parameter accepts a fully qualified volume group ID or a shortened version, if the **-dev** parameter is specified.

To specify a range of volume group IDs, separate the volume group IDs with a hyphen. You must separate multiple volume group IDs or ranges of volume group IDs with a blank space between each ID or range of IDs.

If you use the dash (-), the specified value is read from standard input.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following table represents the headers that are displayed on the output report that is associated with the **lsvolgrp** command using the **-l** parameter. A separate example is not shown for the 1750 because the information is the same for both the 2107 and 1750.

### Invoking the lsvolgrp command

```
dscli>lsvolgrp -dev IBM.2107-75FA120 -l
```

## The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Device: IBM.2107-75FA120

| Name                 | ID   | Type             |
|----------------------|------|------------------|
| Host_xxx<br>_volumes | 1011 | OS400<br>Mask    |
| Host_yyy<br>_volumes | 1111 | OS400<br>Map 256 |
| Host_zzz<br>_volumes | 1211 | SCSI<br>Mask     |

## Report field definitions

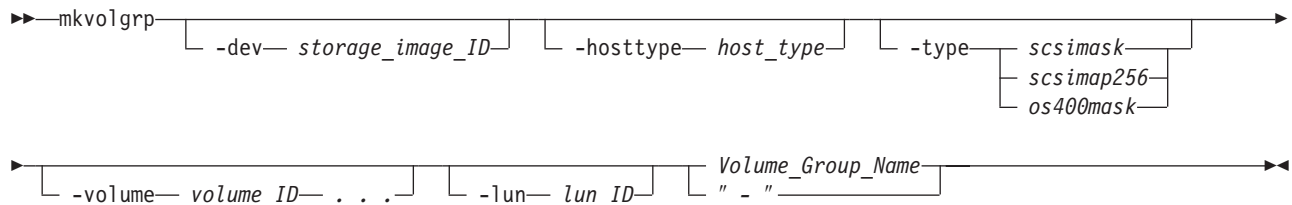
**Name** Specifies the name you assigned for this volume group ID.

**ID** Specifies the storage unit ID followed by the volume group ID. The volume group identifier is a four-digit decimal number, with no leading zeros, prefixed by the letter V.

**Type** Specifies the type of the volume group.

## mkvolgrp

The **mkvolgrp** command creates a volume group in a storage image.



## Parameters

### Notes:

1. It is highly recommended that you use the **-hosttype** parameter when you issue this command.
2. When you create DS6000 volume groups for (RedHat) Linux using the **mkvolgrp** command, the **-type** parameter must be set to **scsimap256**.
3. When you create DS6000 volume groups for AIX5L, the **-type** parameter must be set to **scsimap**.

If you are using an HP-UX operating system, the number of volumes in the volume group must not exceed 7 volumes. This restriction only applies when the **hostconnect** attribute for the **-addrdiscovery** parameter is set to **reportlun** and the associated volume group is of type **scsimap256**.

### **-dev** storage\_image\_ID

(Optional). Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified volume group name.

Example: IBM.1750-68FA120

**-hosttype** *host\_type*

(Optional) Use this parameter as an alternative method for specifying the type of Volume Group.

**Note:** You cannot use this parameter with the **-type** parameter.

**-type** | *scsimask* | *scsimap256* | *os400mask* |

(Optional). Specifies the type of the volume group.

**scsimask (default)**

Creates a SCSI mask volume group. This option is available if the host adapter supports four-byte LUN addresses.

**scsimap256**

Creates a SCSI-MAP 256 volume group.

**os400mask**

Creates an OS400 mask volume group. The IBM iSeries host system typically uses fixed block volumes of 520-byte logical block size. This option is available only if the host adapter supports four-byte LUN addresses.

**Note:** This volume group is also referred to as SCSI520-MASK. When an error message is displayed for the OS400 MASK, SCSI520-MASK is referenced instead.

**Note:** You cannot use this parameter with the **-type** parameter.

**-volume** *volume\_ID* | . . .

(Optional). Specifies the array of volume IDs to include in the volume group. For the **-type** *scsimap256* parameter, the array cannot exceed 256 volume ID entries. Otherwise, up to 64 384 entries are allowed.

The volume ID is a 32-bit number that can be represented as 4 hexadecimal digits in the form of XYZZ where X is the address group (0 - 1), XY together is the logical subsystem number 00 - 1E (for 1750) , and ZZ is the volume number (00 - FF).

To specify a range of volume IDs, separate the volume IDs with a dash (-).

You must separate multiple volume IDs or ranges of volume IDs with a comma between each ID or range of IDs.

Example: 0100-010F,0180-018F,0120

**-lun** *lun\_ID*

(Optional) Specifies the LUN ID in hexadecimal value (00 - FF) which is mapped to the specified volume ID for a SCSI-MAP256 type volume group. If multiple volume IDs are specified by the **-volume** parameter, LUN IDs are assigned consecutively in incremental order.

**Note:** This parameter is only valid for a SCSI-MAP 256 type volume group. If this parameter is specified for any other type of volume group, the command fails.

*Volume\_Group\_Name* | -

(Required). Specifies the volume group name, not to exceed 16 characters. Ensure that the name is unique within the scope of the storage image. Accepts a fully qualified volume group name or a shortened version, if the **-dev** parameter is specified.

If you use the dash (-), the specified value is read from standard input.

## Example (1750)

### Invoking the mkvolgrp command

```
dscli>mkvolgrp -dev IBM.1750-68FA120
-volume 0000-000F host_xyz_volumes
```

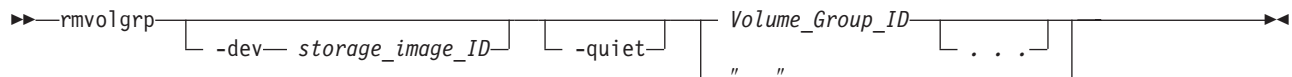
### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

Volume group V0 successfully created.

### rmvolgrp

The **rmvolgrp** command deletes existing volume groups from a storage image.



### Parameters

#### **-dev** *storage\_image\_ID*

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified volume group ID and you do not specify a value for the *dev* variable in your profile file.

Example: IBM.1750-68FA120

#### **-quiet**

(Optional). Specifies that confirmation prompt for this command be turned off.

#### *Volume\_Group\_ID* . . . | -

(Required). Specifies an array of one or more volume groups IDs to be deleted. All volume groups specified must belong to the same storage unit. This parameter also accepts a fully qualified volume group ID, which consists of the storage image ID, or a shortened version without the storage image ID if the **-dev** parameter is specified. The shortened version is a four-digit decimal number with no leading zeroes, prefixed with the letter V.

To specify a range of volume group IDs, separate the volume group IDs with a dash (-).

You must separate multiple volume group IDs or ranges of volume group IDs with a blank space between each ID or range of IDs.

If you use the dash (-), the specified value is read from standard input.

#### Example of **-dev** parameter use

If you specify the **-dev** parameter, you can use the shortened version of the **Volume\_Group\_ID** parameter as follows:

```
dscli>rmvolgrp -dev IBM.1750-68FA120 V11
```

If you do not specify the **-dev** parameter and you specify the **Volume\_Group\_ID** parameter, you must use the fully qualified version of the volume group ID as follows:

```
dscli>rmvolgrp IBM.1750-68FA120/V11
```

## Example (1750)

### Invoking the **rmvolgrp** command

```
dsccli>rmvolgrp IBM.1750-68FA1243/V123
```

### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-68FA120
```

```
Are you sure you want to delete Volume Group IBM.1750-75FA1243/V123? y/n
```

```
Y
```

```
Volume group IBM.1750-75FA1243/V123 successfully deleted.
```

### **showvolgrp**

The **showvolgrp** command displays detailed properties of a volume group.

```
►►—showvolgrp—┐└─dev─ storage_image_ID─┐└─lunmap─┐└─ Volume_Group_ID─┐└─►►
```

### Parameters

#### **-dev** *storage\_image\_ID*

(Optional). Specifies the storage image ID, which consists of manufacturer, machine type, and serial number.

**Note:** This parameter is required if you do not specify a fully qualified volume group ID and you do not specify a value for the *dev* variable in your profile file.

Example: IBM.1750-68FA120

#### **-lunmap**

(Optional). Specifies that a LUN mapping table be displayed that shows the volume ID and LUN ID relationship. This parameter is valid for all scsi and os400 type volume groups.

#### *Volume\_Group\_ID* | -

(Required). Specifies that the properties be displayed for the specified volume group. This parameter accepts a fully qualified volume group ID, which consists of the storage image ID, or a shortened version without the storage image ID if the **-dev** parameter is specified. The shortened version is a four-digit decimal number with no leading zeros, prefixed with the letter *V*.

#### Examples of **-dev** parameter use

If you specify the **-dev** parameter, you can use the shortened version of the **Volume\_Group\_ID** parameter as follows:

```
dsccli>showvolgrp -dev IBM.1750-68FA120 V11
```

where *V11* represents value for the volume group ID.

If you do not specify the **-dev** parameter, and you specify the **Volume\_Group\_ID** parameter, you must specify the fully qualified version of the **Volume\_Group\_ID** parameter as follows:

```
dsccli>showvolgrp IBM.1750-68FA120/V11
```

If you use the dash (-), the specified value is read from standard input.

## Example

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output reports that are associated with the **showvolgrp** command. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the machine type designation, 2107 versus 1750.

**Note:** The volume group type determines the format of the LUN ID that is reported. The following examples demonstrate these differences.

### Invoking the showvolgrp command where the volume group type is SCSI MAP 256

```
dsccli>showvolgrp -lunmap IBM.2107-1300861/V2
```

#### The resulting output

Date/Time: May 17, 2006 8:33:58 AM GMT IBM DS CLI Version: 5.0.0.0  
DS: IBM.2107-1300861

| Name                           | ID | Type                | Vols                                             |
|--------------------------------|----|---------------------|--------------------------------------------------|
| My_host_<br>system_<br>volumes | V2 | SCSI-<br>MAP<br>256 | 1000 1001<br>1002 1003<br>1004 1005<br>1006 1007 |

=====LUN Mapping=====

| Vol  | LUN |
|------|-----|
| 1000 | 00  |
| 1001 | 01  |
| 1002 | 02  |
| 1003 | 03  |
| 1004 | 04  |
| 1005 | 05  |
| 1006 | 06  |
| 1007 | 07  |

### Invoking the showvolgrp command where the volume group type is SCSI Mask

```
dsccli>showvolgrp -lunmap IBM.2107-1300861/V18
```

#### The resulting output

Date/Time: May 17, 2006 8:38:08 AM GMT IBM DS CLI Version: 5.0.0.0  
DS: IBM.2107-1300861

| Name  | ID  | Type          | Vols                                             |
|-------|-----|---------------|--------------------------------------------------|
| myVG1 | V18 | SCSI-<br>Mask | 1000 1001<br>1002 1003<br>1004 1005<br>1006 1007 |

=====LUN Mapping=====

| Vol  | LUN      |
|------|----------|
| 1000 | 40104000 |
| 1001 | 40104001 |
| 1002 | 40104002 |
| 1003 | 40104003 |
| 1004 | 40104004 |
| 1005 | 40104005 |
| 1006 | 40104006 |
| 1007 | 40104007 |

### Report field definitions

**Name** Specifies the name that you assigned for the designated volume group ID.

**ID** Specifies the volume group ID. The volume group identifier is a four-digit decimal number having no leading zeros, and prefixed by a V.

**Type** Specifies the configured volume group type. Any one of the following volume group types can be queried: SCSI all | SCSI Mask | SCSI MAP 256 | os400 all | os400 Mask

**Note:** **os400 all** and **os400 Mask** are sometimes referred to as **SCSI520 all** and **SCSI520 Mask**.

**Vols** Identifies the complement of accessible volume numbers within the designated volume group.

**Vol (part of LUN mapping table)**  
Specifies the volume ID.

**LUNS (part of LUN mapping table)**  
Specifies the LUN ID that is mapped to the designated volume ID. As noted in the examples, the LUN IDs can be different based on volume group type.

## Advanced operation commands

This section contains commands that are used to further administer and tune storage.

Use the following command to administer and tune storage:

**clearvol**

The clearvol command clears Copy Services relationships for a base logical volume.

**clearvol**

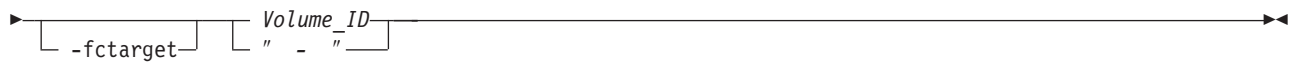
The **clearvol** command clears Copy Services relationships for a base logical volume.

```

>> clearvol -dev storage_image_ID -pprcsource -pprctarget -fcsource

```





## Parameters

### **-dev** *storage\_image\_ID*

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the volume ID.

Example: IBM.1750-68FA120

### **-pprcsource**

(Optional). This parameter is used with a base logical volume. It removes any remote mirror and copy relationships on the logical volume where the specified logical volume operates as a remote mirror and copy source.

### **-pprctarget**

(Optional). This parameter is used with a base logical volume. It removes any remote mirror and copy relationships on the logical volume where the specified logical volume operates as a remote mirror and copy target.

### **-fcsource**

(Optional). This parameter is used with a base logical volume. It removes any FlashCopy relationships on the logical volume where the specified logical volume operates as a FlashCopy source.

### **-fctarget**

(Optional). This parameter is used with a base logical volume. It removes any FlashCopy relationships on the logical volume where the specified logical volume operates as a FlashCopy target.

### *Volume\_ID* | -

(Required). Specifies the volume ID where Copy Services relationships are to be cleared. This parameter accepts a fully qualified volume ID, which includes the storage image ID or a shortened version, if the **-dev** parameter is specified. The volume ID is a 32 bit number that can be represented as 4 hexadecimal digits in the form of XYZZ where X is the address group (0 - 1), XY together is the logical subsystem number 00 - 1E (for 1750) , and ZZ is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input.

Example: IBM.1750-68FA120/0001

## Example (1750)

### Invoking the clearvol command

```
dscli>clearvol -dev IBM.1750-68FA120 0001
```

### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

```
Volume 0001 successfully cleared.
```

## Copy Services commands

This section contains Copy Services commands.

You can use the following Copy Services commands to manage Copy Services tasks.

## FlashCopy commands

This section contains commands that are used to configure FlashCopy relationships and to display FlashCopy information.

Use the following commands to configure FlashCopy relationships and to display FlashCopy information:

- **commitflash**
- **resyncflash**
- **lsflash**
- **mkflash**
- **reverseflash**
- **revertflash**
- **rmflash**
- **unfreezeflash**
- **setflashrevertible**

The **commitflash** command completes a partially formed Global Mirror consistency group. It is used as part of the recovery from a disaster.

The **resyncflash** command creates a point-in-time copy of an existing FlashCopy pair that was established with the **-record** and **-persist** parameters. The **resyncflash** command only copies the parts of the volume that have changed since the last point in time copy.

The **lsflash** command generates a report that displays a list of FlashCopy relationships and the status information for each FlashCopy relationship in the list.

The **mkflash** command initiates a point-in-time copy from source volumes to target volumes.

The **reverseflash** command reverses the FlashCopy relationship.

The **revertflash** command restores the former Global Mirror consistency group from one that is currently forming. It is used as part of the recovery from a disaster.

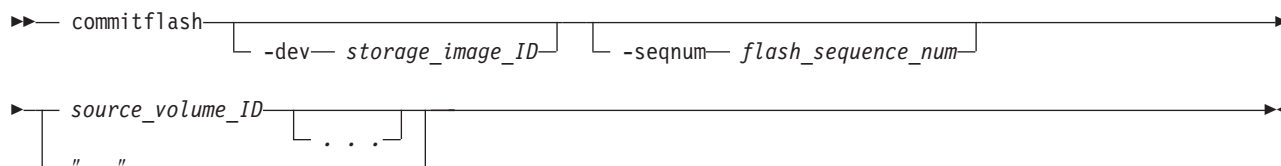
The **rmflash** command removes a relationship between FlashCopy volume pairs.

The **unfreezeflash** command resets a FlashCopy consistency group that was previously established with the **-freeze** parameter when the **mkflash** or **resyncflash** commands were issued.

The **setflashrevertible** command modifies a FlashCopy volume pair that is part of a Global Mirror relationship to revertible. The revertible feature allows data to be committed to the target to form a new consistency group, or restored back to the last consistency group.

### **commitflash**

The **commitflash** command is used as part of the recovery from a disaster scenario to complete a partially formed Global Mirror consistency group.



## Parameters

The following transactions must be completed before you can issue the **commitflash** command:

1. Issue the **mkflash** command with the **-record** and **-persist** parameters specified to establish the FlashCopy volume pair relationship.
2. Issue the **setflashrevertible** command on the FlashCopy volume pair.

### **-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for all the source volumes and you do not specify a value for the *dev* variable in your profile file.

Example: IBM.1750-68FA120

### **-seqnum** *flash\_sequence\_number*

(Optional) When a FlashCopy sequence number is specified, the commit operation is performed only on those relationships that are associated with the specified number.

This parameter is not supported for machine type 2105.

Example: 0010

### *source\_volume\_ID* . . . | -

(Required) Specifies the source volumes for which FlashCopy relationships are to be committed. The chosen FlashCopy pair is the one established or modified with the **-record** parameter. This parameter accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if either the **-dev** parameter is specified or you specify a value for the *dev* variable in your profile file. You must separate multiple source volume IDs with spaces.

The volume ID is a 32-bit number that can be represented as 4 hexadecimal digits in the form of XYZZ where X is the address group (0 - 1), XY together is the logical subsystem number 00 - 1E (for 1750) , and ZZ is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input.

Example of a fully qualified volume ID: IBM.1750-68FA120/0001

Example of a shortened version: 0001

Example of multiple IDs: 0001 0003 0008

## Example (1750)

### Invoking the commitflash command

```
dscli>commitflash IBM.1750-68FA120/0100
```

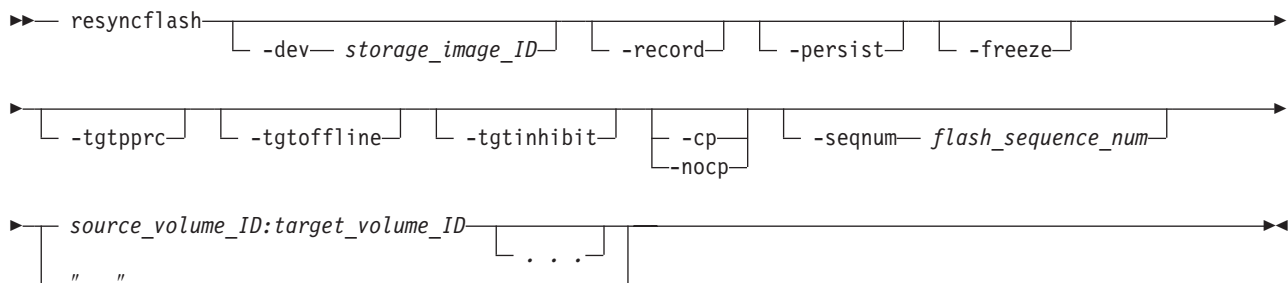
### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120

FlashCopy volume pair IBM.1750-75FA120/0100:IBM.1750-68FA120/0200  
successfully committed.

## resyncflash

The **resyncflash** command is a point-in-time copy of an existing FlashCopy pair that was established with the **-record** and **-persist** parameters. The **resyncflash** command only copies the parts of the volume that have changed since the last point-in-time copy. When a pair is established with the **-record** and **-persist** parameters, the pair initially synchronizes and a record of all host write operations to the source is maintained in the source volumes. When the **resyncflash** command is issued on the FlashCopy pair, the new data that is written to the source is copied to the target. The parameters that are specified in this command replace the parameters in the existing relationship. In order to keep the initial **-record** and **-persist** parameters, the **-record** and **-persist** parameters must be specified in the **resyncflash** command.



## Parameters

### **-dev storage\_image\_ID**

(Optional) Specifies the storage image ID, which includes values for the manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source and target volumes and you do not specify a value for the *devid* variable in your profile file.

Example: IBM.1750-68FA120

### **-record**

(Optional) Records the changed tracks on both volumes within a FlashCopy pair. Use this parameter if you intend to use the **resyncflash** command again with this pair. The **-persist** parameter is automatically selected when the **-record** parameter is selected.

**Note:** You cannot reissue the **resyncflash** command if you leave this parameter out of your command string.

### **-persist**

(Optional) Retains the FlashCopy relationship after the background copy completes. The FlashCopy relationship between the source and the target volumes remains indefinitely until it is broken by a **rmflash** command. This parameter is automatically selected when the **-record** parameter is selected. Select this parameter along with the **-record** parameter if you are using this volume pair with the commands **resyncflash**, **reverseflash**, or **setflashrevertible**.

**Note:** You cannot reissue the **resyncflash** command if you leave this parameter out of your command string.

**-freeze**

(Optional) Triggers the *queue full* condition for the source volume. All writes to the source volume are queued by the host and are written after the *queue full* condition is reset.

During the *queue full* condition, the source volume reports *long busy* status.

The *queue full* condition is reset by an *extended long busy timeout*. The timeout condition affects all FlashCopy source volumes that are contained within a respective logical subsystem and that are established or modified with the **-freeze** parameter.

**-tgtpprc**

(Optional) Allows the FlashCopy target volume to be a Remote Mirror and Copy source volume.

**-tgtoffline**

(Optional) Causes the **mkflash** command to be rejected if the target volume is online for host system access. This parameter only applies to CKD volumes.

**-tgtinhibit**

(Optional) Prevents host system write operations to the target while the FlashCopy relationship exists.

**-seqnum** *flash\_sequence\_num*

(Optional) Associates the FlashCopy relationships that are established with the specified sequence number. This sequence number can be used as an identifier for a relationship or group of relationships. Only the relationships that are modified successfully by the **resyncflash** command receive the specified sequence number, leaving the relationships that failed with the previous relationship (if the relationships were previously specified).

This parameter is not supported for machine type 2105.

Example: 0010

**source\_volume\_ID:target\_volume\_ID . . . | -**

(Required) Increments a FlashCopy relationship for the source and target volume pairs with the specified IDs. This parameter accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the **-dev** parameter is specified or you specify a value for the *dev* variable in your profile file. You must separate multiple FlashCopy pair IDs with spaces.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The volume ID is a 32-bit number that can be represented as 4 hexadecimal digits in the form of XYZZ, where X is the address group (0 - 1), XY together is the logical subsystem number 00 - 1E (for 1750), and ZZ is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input. You cannot use the dash (-) while you are in the DS CLI interactive command mode.

Example of a fully qualified FlashCopy pair ID: IBM.1750-75FA120/  
0001:IBM.1750-68FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

### Example (1750)

#### Invoking the resyncflash command

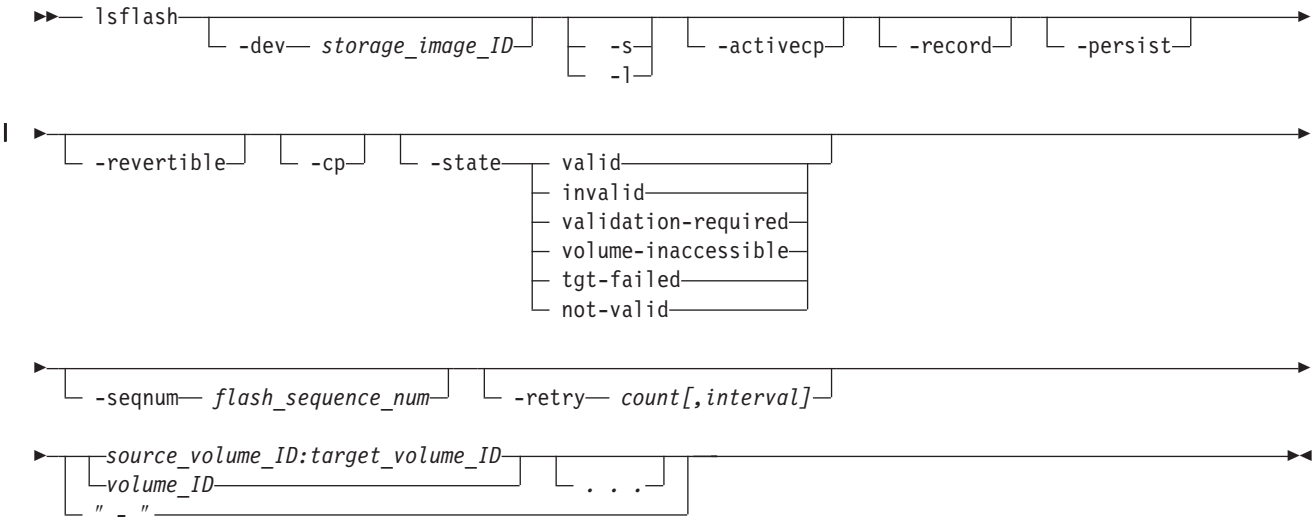
```
dsccli>resyncflash IBM.1750-68FA120/0100:IBM.1750-68FA120/0200
```

#### The resulting output

```
|
| Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
| DS: IBM.1750-68FA120
|
| Remote FlashCopy volume pair IBM.1750-68FA120/0100:IBM.1750-68FA120/0200
| successfully resynchronized.
```

### lsflash

The **lsflash** command displays a list of FlashCopy relationships and status information for each FlashCopy relationship in the list.



### Parameters

- dev storage\_image\_ID (Optional) Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source and target volumes and you do not specify a value for the *dev*id variable in your profile file.
- s (Optional) Displays FlashCopy pair IDs. You cannot use the -s and the -l parameters together.
- l (Optional) Displays the default output plus additional attributes that are identified as long output. You cannot use the -l and the -s parameters together.
- activecp (Optional) Displays the FlashCopy relationships where their background copy process is active.

**Note:** The background copy process might be inactive for a while before it starts.

**-record**

(Optional) Displays the FlashCopy relationships that were established with the **-record** parameter.

**-persist**

(Optional) Displays the FlashCopy relationships that were established with the **-persist** parameter.

**-revertible**

(Optional) Displays the FlashCopy relationships that were established with the **-revertible** parameter.

**-cp**

(Optional) Displays the FlashCopy relationships that were established with the **-cp** parameter.

**-state valid | invalid | validation-required | volume-inaccessible | tgt-failed | not-valid**

(Optional) Displays the FlashCopy relationships that are identified by the specific state.

**Note:** When you specify **not-valid**, all FlashCopy relationships that do not meet the requirements for the **valid** state are displayed.

**-seqnum** *flash\_sequence\_number*

(Optional) Displays the FlashCopy relationships that are associated with the specified sequence number. The default is 0000.

**Note:** This parameter is not supported for machine type 2105.

**-retry** *count[,interval]*

(Optional) Specifies how you want the system to handle a validation-required state.

The system currently handles a validation-required state as follows:

- If there are one or more FlashCopy relationships, an immediate retry is initiated. In most cases, the reasons for the validation-required state are cleared by the time that the retry is processed and normal processing continues.
- If the validation-required state still exists after the first retry, the system initiates 5 wait and retry cycles with a delay of 5 seconds between each cycle. At any time during these cycles, if the reasons for the validation-required state are cleared, normal processing continues.

You can change how the system handles a validation-required state as follows:

- Set the number of retries (count) to 0. When you set the number of retries to 0, it prevents the system from attempting any retries.
- Set the number of retries to 1. The system performs an immediate retry if there are one or more FlashCopy relationships in the validation-required state. The 5-second delay is not initiated.
- Set the number of retries to *N*, with *N* greater than 1. The system performs an immediate retry if there are one or more FlashCopy relationships in the validation-required state, followed by at least 1 wait and retry loop. The default for *N* is 6. You can change the length of the 5-second default wait delay using the optional interval value.

*source\_volume\_ID:target\_volume\_ID* | *volume\_ID* . . . | -

(Required) Displays the FlashCopy relationships for the source and target volume pairs with the specified IDs, or displays the FlashCopy relationships for a single volume ID if the volume ID is specified.

This parameter accepts fully qualified volume IDs, which includes the storage image IDs, or a shortened version without storage image IDs, if the **-dev** parameter is specified or you can specify a value for the *devid* variable in your profile file.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The volume ID is a 32-bit number that can be represented as 4 hexadecimal digits in the form of XYZZ, where X is the address group (0 - 1), XY is the logical subsystem number 00 - 1E (for DS6000) , and ZZ is the volume number (00 - FF).

You must separate multiple IDs with spaces. You can specify FlashCopy pair IDs and a range of FlashCopy pair IDs, or you can specify volume IDs and a range of volume IDs. You cannot specify a combination of FlashCopy pair IDs and volumes IDs.

If you use the dash (-), the specified value is read from standard input. You cannot use the dash (-) while you are in the DS CLI interactive command mode.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **lsflash** command using the **-l** parameter.

### Invoking the lsflash command

```
dscli>lsflash -dev IBM.2107-75FA120 -l 0100:0200 0101:0201 0102:0202 0103:0203
```

### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0  
DS: IBM.2107-75FA120

| ID        | SrcLSS | SequenceNum | Time-out (secs) | Active Copy | Recording | Persistent | Revertible |
|-----------|--------|-------------|-----------------|-------------|-----------|------------|------------|
| 0100:0200 | 01     | 10          | 120             | Disabled    | Disabled  | Disabled   | Disabled   |
| 0101:0201 | 01     | 10          | 120             | Disabled    | Disabled  | Disabled   | Disabled   |
| 0102:0202 | 01     | 11          | 120             | Disabled    | Disabled  | Disabled   | Disabled   |
| 0103:0203 | 01     | 11          | 120             | Disabled    | Disabled  | Disabled   | Disabled   |

## Report field definitions

**ID** Specifies the FlashCopy pair ID. This ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship.



**SrcLSS**

Specifies the Consistency Group LSS ID that is associated with the source volume of this FlashCopy relationship.

**SequenceNum**

Specifies the sequence number that is associated with the FlashCopy relationship.

**Note:** This item is not supported on the 2105.

**Timeout (secs)**

Specifies the consistency group Long Busy Timeout setting for the LSS ID that is associated with the source volume of this FlashCopy relationship. You can specify a value in the range of 1 - 600 000. The default value is 120 seconds.

**ActiveCopy**

Specifies whether the background copy process is active for this FlashCopy relationship.

**Recording**

Specifies whether this FlashCopy relationship was established with the record changes option.

**Persistent**

Specifies whether this FlashCopy relationship was established with the persistent option.

**Revertible**

Specifies whether this FlashCopy relationship was established with the revertible option.

**SourceWriteEnabled**

Specifies whether this FlashCopy relationship was established with the allow source writes option.

**TargetWriteEnabled**

Specifies whether this FlashCopy relationship was established with the allow target writes option.

**BackgroundCopy**

Specifies whether this FlashCopy relationship was established with the run background copy option.

**OutOfSyncTracks**

Specifies the number of tracks that are not synchronized for this FlashCopy relationship. The maximum value that can be displayed is dependent on the source volume size.

**DateCreated**

Specifies the date and the time that the FlashCopy relationship was established.

**DateSynced**

Specifies the date and time that FlashCopy relationship was synchronized, or specifies null (-) if the relationship is not synchronized.

**State**

Specifies the state of the FlashCopy relationships. One of the following values is displayed for each FlashCopy relationship:

**Note:** When a query indicates any state other than valid, the only information that is displayed on the report is the FlashCopy pair ID and the state condition. The rest of the information columns are displayed with a null (-) value.

**Valid** Indicates that the FlashCopy relationship is in a normal state, and that it has been queried successfully.

#### Validation Required

Indicates that the FlashCopy relationship cannot be queried. Generally, the reason that the query is blocked is only temporary. If you issue a new query within several seconds, the problem no longer exists.

#### Tgt Failed

Indicates that the FlashCopy relationship is in an error state. The point-in-time copy is lost, and the FlashCopy relationship must be withdrawn. You must issue the **rmflash** command to remove the FlashCopy relationship.

#### Volume Inaccessible

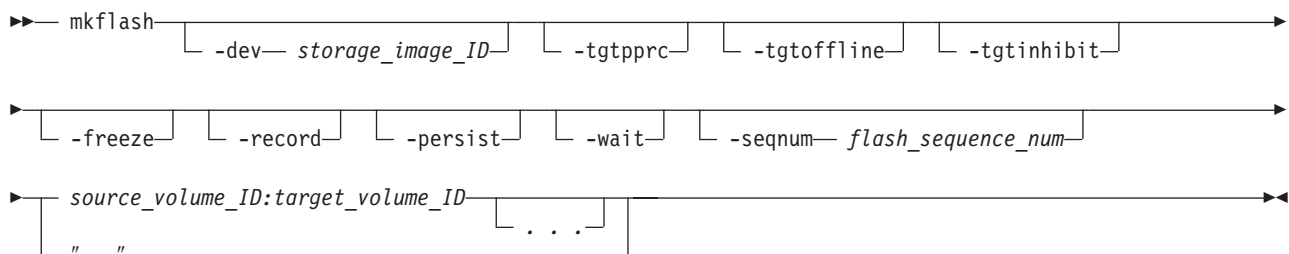
Indicates that the volume cannot be accessed and that the query has failed. When this state is displayed, it generally means that the volume is in a fenced condition.

#### Invalid

Indicates that a general internal error occurred when the query was processed.

### mkflash

The **mkflash** command initiates a point-in-time copy from source volumes to target volumes.



### Parameters

#### -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which consists of a manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source and target volumes and you do not specify a value for the *dev* variable in your profile file.

Example: IBM.1750-68FA120

#### -tgtpprc

(Optional) Allows the FlashCopy target volume to be a remote mirror and copy source volume.

**-tgtoffline**

(Optional) Causes the **mkflash** command to be rejected if the target volume is online for host system access. This parameter applies only to count key data volumes.

**-tgtinhibit**

(Optional) Prevents host system write operations to the target while the FlashCopy relationship exists.

**-freeze**

(Optional) Triggers the *queue full* condition for the source volume. All writes to the source volume are queued by the host and are written after the *queue full* condition is reset.

During the *queue full* condition, the source volume reports *long busy* status.

The *queue full* condition is reset by an *extended long busy timeout* condition. The timeout condition affects all FlashCopy source volumes that are contained within a respective logical subsystem and that are established or modified with the **-freeze** parameter.

**Note:** Use the **chlss** and the **chlcu** commands to modify the extended long busy timeout setting.

**-record**

(Optional) Records the changed tracks on both volumes within a FlashCopy pair. Select this parameter when you establish an initial FlashCopy volume pair that you intend to use with the **resyncflash** command. The **-persist** parameter is automatically selected when this parameter is selected.

**-persist**

(Optional) Retains the FlashCopy relationship after the background copy completes. The FlashCopy relationship between the source and the target volumes remains indefinitely until you issue a **rmflash** command. This parameter is automatically selected when the **-record** parameter is selected. Select this parameter along with the **-record** parameter if you will be using this volume pair with the **resyncflash**, **reverseflash**, or **setflashrevertible** commands.

**-nocp**

(Optional) Inhibits background copy. Data is copied from the source volume to the target volume only if a track on the source volume is modified. The FlashCopy volume pair relationship remains indefinitely until it is broken by a **rmflash** command, or until all tracks on the source volume are modified.

When **-tgtse** is specified and neither the **-cp** nor the **-nocp** parameters are specified, the no background copy behavior is the default.

You cannot use the **-nocp** parameter with the **-cp** parameter in the same command.

**-seqnum** *flash\_sequence\_num*

(Optional) Associates the FlashCopy relations that are established with the specified sequence number. This sequence number can be used as an identifier for a relation or group of relations.

This parameter is not supported for machine type 2105.

Example: 0010

*source\_volume\_ID:target\_volume\_ID . . . | -*

(Required) Establishes a FlashCopy relationship for the source and target

volume pairs with the specified IDs. This command accepts fully qualified volume IDs, which consist of storage image IDs or a shortened version without storage image IDs, if the **-dev** parameter is specified. You can also specify a value for the *dev* variable in your profile file. You must separate multiple FlashCopy pair IDs with spaces.

A FlashCopy pair ID consists of two volume IDs: one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

**Note:** During processing you might receive an error message indicating that relationships have been exceeded or that an initial volume format is in progress. This means that the FlashCopy relationship cannot be established because the maximum number of relationships have already been established. Or, the volume was recently created and is still being initialized to support FlashCopy processing. You can issue a **mkflash** command to establish the FlashCopy relationship after the initial volume format process is complete.

The volume ID is a 32-bit number that can be represented as 4 hexadecimal digits in the form of *XYZZ*, where *X* is the address group (0 - 1), *XY* together is the logical subsystem number 00 - 1E (for 1750) , and *ZZ* is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input.

Example of a fully qualified FlashCopy pair ID: IBM.1750-68FA120/0001:IBM.1750-68FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

## Example (1750)

### Invoking the mkflash command

```
dsccli>mkflash IBM.1750-68FA120/0100:IBM.1750-75FA120/0200
```

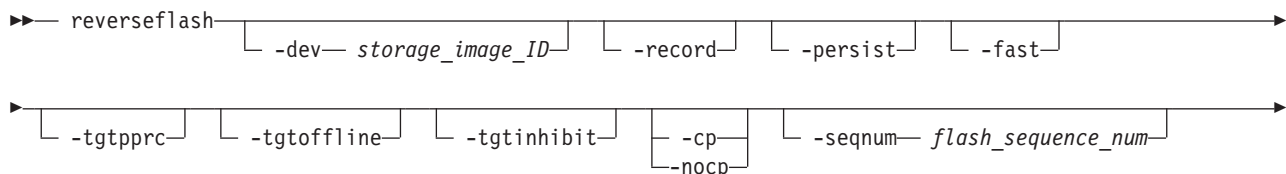
### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

FlashCopy pair IBM.1750-75FA120/0100:IBM.1750-75FA120/0200 successfully created.

### reverseflash

The **reverseflash** command reverses the FlashCopy relationship.





## Parameters

The direction of a FlashCopy relationship can be reversed, where the volume that was previously defined as the target becomes the source for the volume that was previously defined as the source (and is now the target). The data that has changed is copied to the volume that was previously defined as the source. For example, suppose you create a FlashCopy relationship between source volume A and target volume B. Data loss occurs on source volume A. To keep applications running, you can reverse the FlashCopy relationship so that volume B is copied to volume A.

The source volume and the target volume that are specified by this command are the current source and target volumes that, as a result of this command process, become reversed. The specified target volume becomes the source and the specified source volume becomes the target. The target parameters specified by this command apply to the new target (the source volume that becomes the target volume when this command is processed).

After the reversal takes place, ensure that you designate this new relationship when you issue any future commands. Failure to designate this reversed relationship could produce unexpected results. For example, you reverse the relationship of source volume 1600 and target volume 1800. Using the **reverseflash** command, your source volume becomes 1800 and your target volume become 1600. All queries and future processing on this relationship must show volume 1800 as your source and volume 1600 as your target.

The following list defines the parameters that are associated with the **reverseflash** command:

### **-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source and target volumes and you do not specify a value for the *devid* variable in your profile file.

Example: IBM.1750-75FA120

### **-record**

(Optional) Records the changed tracks on both volumes within a FlashCopy pair. Use this parameter when you establish an initial FlashCopy volume pair that you intend to use with the **resyncflash** command. The **-persist** parameter is automatically designated when the **-record** parameter is selected.

### **-persist**

(Optional) Retains the FlashCopy relationship after the background copy completes. The FlashCopy relationship between the source and the target volumes remains indefinitely until it is broken by a **rmflash** command. This parameter is automatically designated when the **-record** parameter is specified. Select the **-persist** parameter along with the **-record** parameter if you are using this volume pair with the **resyncflash**, **reverseflash**, or **setflashrevertible** commands.

### **-fast**

(Optional) Specify this parameter when the **reverseflash** command will be issued before the background copy completes.

**Note:** To use the fast reverse function, the relationship must be set to Target write inhibit. The fast reverse processing function is intended for use as part of Global Mirror recovery process.

At the end of this operation (processing the **reverseflash** command with the **-fast** parameter), the original FlashCopy target volume is unusable. Normally, after this command completes the background copy, the new FlashCopy target is used as FlashCopy source to restore the original FlashCopy target.

**-tgtpprc**

(Optional) Allows the FlashCopy target volume to be a Remote Mirror and Copy source volume.

**-tgtoffline**

(Optional) Causes the **reverseflash** command to be rejected if the target volume is online for host system access. This parameter only applies to CKD volumes.

**-tgtinhibit**

(Optional) Prevents host system write operations to the target while the FlashCopy relationship exists.

**-seqnum** *flash\_sequence\_num*

(Optional) Associates the FlashCopy relations that are reversed with the specified sequence number. Only the relations that are successfully modified by the command receive the specified sequence number, leaving the ones that failed with the previous number (if previously specified). The sequence number is a four-digit hexadecimal number (0000 - FFFF). The default is 0000.

Example: 0010

This parameter is not supported for machine type 2105.

*source\_volume\_ID:target\_volume\_ID . . . | -*

(Required) Reverses a FlashCopy relationship for the source and target volume pairs with the specified IDs. This parameter accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the **-dev** parameter is specified or you specify a value for the *dev* variable in your profile file. You must separate multiple FlashCopy pair IDs with spaces.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The volume ID is a 32 bit number that can be represented as 4 hexadecimal digits in the form of XYZZ where X is the address group (0 - 1), XY together is the logical subsystem number 00 - 1E (for 1750) , and ZZ is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input.

Example of a fully qualified FlashCopy pair ID: IBM.1750-68FA120/  
0001:IBM.1750-68FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

## Example (1750)

### Invoking the reverseflash command

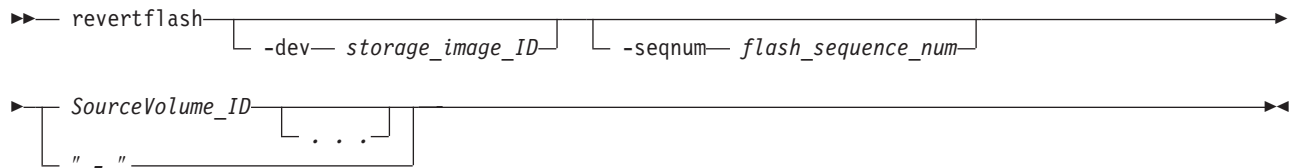
```
dscli>reverseflash IBM.1750-68FA120/0100:IBM.1750-68FA120/0200
```

### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120 FlashCopy volume pair
IBM.1750-68FA120/0100:IBM.1750-68FA120/0200 successfully reversed.
```

### revertflash

The **revertflash** command is used as part of the recovery from a disaster scenario to rollback a Global Mirror consistency group that is in the process of forming. The former Global Mirror consistency group is restored.



### Parameters

#### **-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source volume and you do not specify a value for the *dev* variable in your profile file.

Example: IBM.1750-685FA120

#### **-seqnum** *flash\_sequence\_num*

(Optional) Specifies the FlashCopy sequence number. When this number is specified, the **revertflash** operation is performed only on those relations associated with the specified number.

This parameter is not supported for machine type 2105.

Example: 0010

#### *SourceVolumeID* . . . | -

(Required) Specifies the source volume ID for which the FlashCopy relationship is to be reverted. The chosen FlashCopy pair is the one established or modified with the **-record** parameter. This parameter accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the **-dev** parameter is specified or you specify a value for the *dev* variable in your profile file. You must separate multiple source volume IDs with spaces.

The volume ID is a 32-bit number that can be represented as 4 hexadecimal digits in the form of *XYZZ* where *X* is the address group (0 - 1), *XY* together is the logical subsystem number 00 - 1E (for 1750), and *ZZ* is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input.

Example of a fully qualified volume ID: IBM.1750-68FA120/0001

Example of a shortened version: 0001

Example of multiple IDs: 0001 0003 0008

## Example (1750)

### Invoking the revertflash command

```
dscli>revertflash -dev
IBM.1750-68FA120 0100
```

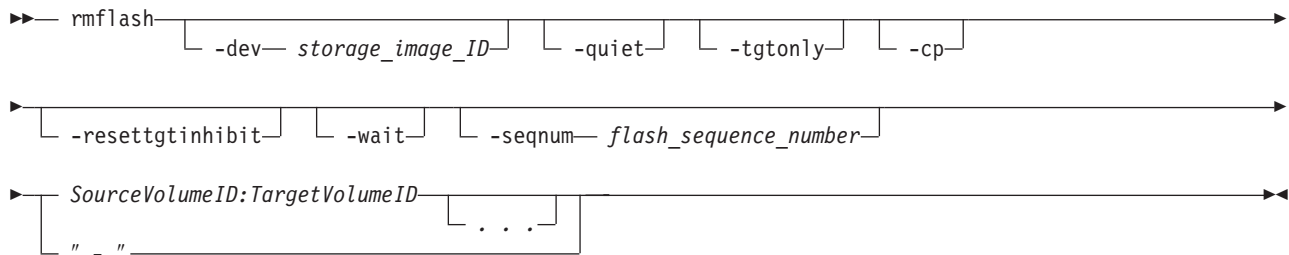
### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

FlashCopy pair 0100:0200 successfully reverted.

## rmflash

The **rmflash** command removes a relationship between FlashCopy volume pairs.



## Parameters

### Notes:

1. Invoking this command with the **-cp** parameter on a FlashCopy relationship that was previously marked with the **-persist** parameter will not remove the relationship. Instead, the source data is copied to the target.
2. Invoking this command with the **-resettgtinhibit** parameter does not withdraw the relationship, but resets the **-tgtinhibit** parameter if it was previously set.
3. All settings apply to all specified FlashCopy pairs.
4. Do not use the **-wait** parameter on persistent relations.
5. The **-seqnum** parameter is not supported for a 2105 machine type.

### **-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source and target volumes and you do not specify a value for the *dev*id variable in your profile file.

Example: IBM.1750-68FA120

### **-quiet**

(Optional) Specifies that the confirmation prompt for this command be turned off.

### **-tgtonly**

(Optional) Specifies the target volume of the FlashCopy pair to remove the relationship. In addition, the *Copy Indicator* for the target volume is reset.



**Note:** If you use the **-tgtonly** parameter on CKD volumes, any data set level relationships created by a S/390 host are removed from the specified target volume.

**-cp**

(Optional) Specifies that the FlashCopy relationship be changed from *No Copy* to *Copy* and that the remaining source volume tracks be copied to the target volume. The relationship is removed when all the data is copied unless the relationship is persistent. When this parameter is specified, the copy takes place for all volume pairs where the source volume ID is identical to the source volume that is specified in the command.

**-resettgtinhibit**

(Optional) Specifies that the flag that does not allow host system write operations to the target ID while the FlashCopy relationship exists be reset, in case it was previously set.

**Note:** Specifying this parameter in itself does not cause the FlashCopy relationship to be withdrawn.

**-wait**

(Optional) Specifies that the command response be delayed until the background copy process completes.

**Notes:**

1. Only pairs of source and target volume IDs are allowed when you use the **-wait** parameter.
2. The **-cp** parameter must be used with the **-wait** parameter.
3. Do not use the **-wait** parameter on relationships that are marked **-persist**, an error occurs when this is done.

**-seqnum** *flash\_sequence\_num*

(Optional) Specifies the FlashCopy sequence number. When this number is specified, the **rmflash** operation is performed only on those relationships associated with the specified number.

Example: 0010

**Note:** This parameter is not supported for a 2105 machine type.

**SourceVolumeID:TargetVolumeID . . . | -**

(Required) Specifies the source and target volume pairs for which the FlashCopy relationships are removed. This parameter accepts a fully qualified volume ID, which includes storage image IDs, or a shortened version without storage image IDs if the **-dev** parameter is specified or you specify a value for the *dev* variable in your profile file. You must separate multiple FlashCopy pair IDs with spaces.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

When the **-tgtonly** parameter is specified, you must enter volume IDs. Volume pair IDs are not valid with the **-tgtonly** parameter.

If you use the dash (-), the specified value is read from standard input.  
However, you cannot use this feature if you are using the DS CLI interactive command mode.

Example of a shortened version: 0001:0004

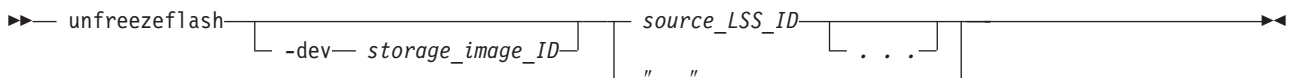
### Example (1750)

```
dsccli>rmflash
IBM.1750-68FA12/00100:1750-68FA12/0200
```

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120

```
FlashCopy pair IBM.1750-68FA120/0100:IBM.1750-68FA120/0200 successfully removed.
```

The **unfreezeflash** command resets a FlashCopy consistency group that was previously established with the **-freeze** parameter when the **mkflash** or **resyncflash** commands were issued.



```
-dev storage_image_ID
```

source\_LSS\_ID . . . | -

(Required) Specifies that the FlashCopy consistency group be reset for the designated source LSS IDs. The parameter also accepts fully qualified LSS IDs, which includes the storage image ID, or a shortened version without the storage image ID if the **-dev** parameter is specified or you specify a value for the *dev* variable in your profile file.

The fully qualified LSS ID format is storage\_image\_ID/XX, where XX is a hexadecimal number in the range 00 - 1F (1750 only).

If you use the dash (-), the specified value is read from standard input.

| Example of a fully qualified LSS ID: IBM.1750-68FA120/00  
 | Example of a shortened version: 00  
 | Example of multiple IDs: 10 20 30

## Example (1750)

### Invoking the unfreezeflash command

```
dsccli>unfreezeflash IBM.1750-68FA120/01
```

### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0

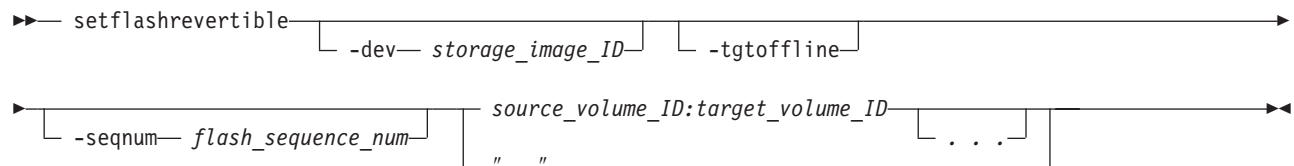
DS: IBM.1750-68FA120
```

```
FlashCopy consistency group for logical subsystem IBM.1750-75FA120 01

successfully reset.
```

### setflashrevertible

The **setflashrevertible** command modifies a FlashCopy volume pair that is part of a FlashCopy relationship to *revertible*. The revertible feature allows data to be committed to the target to form a new consistency group or to revert to the last consistency group. This command must be run before the FlashCopy pair can be committed or reverted.



## Parameters

**Note:** The **-nocp**, **-record**, **-persist**, and **-tgtinhibit** (target inhibit) parameters are included automatically when this command processes.

### -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source volume and you do not specify a value for the *dev* variable in your profile file.

Example: IBM.1750-68FA120

### -tgtoffline

(Optional) Causes an establish FlashCopy volume pair command to be rejected if the target volume is online for host system access. This parameter applies only to CKD volumes.

### -seqnum flash\_sequence\_num

(Optional) Associates the FlashCopy relationships that are changed with the specified sequence number. Only the relationships that are successfully modified by the command are assigned the specified sequence number, leaving the ones that fail with the previous number (if previously specified).

This parameter is not supported for machine type 2105.

Example: 0010

*source\_volume\_ID:target\_volume\_ID . . . | -*

(Required) Modifies FlashCopy relationships for the source and target volume pairs with the IDs specified. This parameter accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs, if the **-dev** parameter is specified. Or, you can specify a value for the *dev* variable that resides in your profile file. You must separate multiple FlashCopy pair IDs with spaces.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The volume ID is a 32 bit number that can be represented as 4 hexadecimal digits in the form of *XYZZ*, where *X* is the address group (0 - 1), *XY* together is the logical subsystem number 00 - 1E (for 1750) , and *ZZ* is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input. You cannot use the dash (-) while you are in the DS CLI interactive command mode.

Example of a fully qualified FlashCopy pair ID: IBM.1750-68FA120/0001:IBM.1750-68FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

## Example (1750)

### Invoking the **setflashrevertible** command

```
dscli>setflashrevertible
IBM.1750-68FA120/0100:IBM.1750-68FA120/0200
```

### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

FlashCopy volume pair IBM.1750-68FA120/0100:IBM.1750-68FA120/0200 successfully made revertible.

## Remote FlashCopy commands

This section contains commands that are used to configure Remote FlashCopy relationships and to display Remote FlashCopy information. Remote FlashCopy commands are used to process what was formerly known as inband FlashCopy transactions. These types of transactions cannot be handled through the GUI.

Use the following commands to configure Remote FlashCopy relationships and to display Remote FlashCopy information. Also, see the *Processing Remote FlashCopy (inband) transactions* scenario for more details.

- **commitremoteflash**
- **resyncremoteflash**
- **lsremoteflash**
- **mkremoteflash**
- **revertremoteflash**

- **rmremoteflash**
- **setremoteflashrevertible**

The **commitremoteflash** command sends data to a target volume to form a consistency between the remote source and target FlashCopy pair.

The **resyncremoteflash** command increments an existing remote FlashCopy pair that has been established with the **-record** and **-persist** parameters.

The **lsremoteflash** command generates a report that displays a list of FlashCopy relationships and the status information for each FlashCopy relationship in the list.

The **mkremoteflash** command initiates a remote point-in-time copy from source volumes to target volumes through a remote mirror and copy relationship.

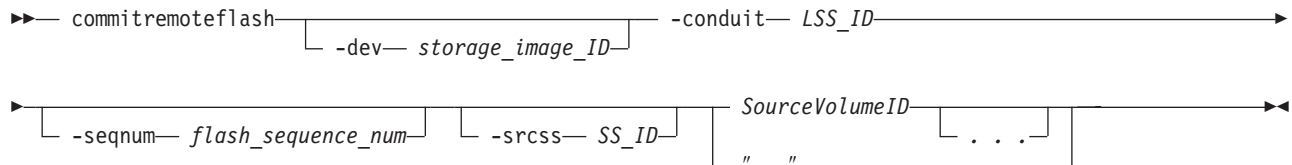
The **revertremoteflash** command restores data on the source volume to its most recent consistency formation.

The **rmremoteflash** command removes a relationship between remote FlashCopy volume pairs.

The **setremoteflashrevertible** command modifies the specified remote FlashCopy volume pair that is part of a Global Mirror relationship to a revertible state. This command must be run before the FlashCopy pair can be committed or reverted.

### commitremoteflash

The **commitremoteflash** command sends data to a target volume to form a consistency between the remote source and target FlashCopy pair.



### Parameters

#### Notes:

1. Establish the pair by issuing either the **mkflash** or **mkremoteflash** command with the **-record** and **-persist** parameters.
2. Issue either the **setflashrevertible** or **setremoteflashrevertible** command against the pair.

Only after you have taken these two steps can you issue the **commitremoteflash** command.

#### **-dev storage\_image\_ID**

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for all the source volumes and you do not specify a value for the *dev* variable in your profile file.

Example: IBM.1750-68FA120

**-conduit** *LSS\_ID*

(Required) Specifies the source logical subsystem (LSS) of an existing remote mirror and copy relationship that is to be used as a means for communicating with the remote storage image. The source volume IDs that are specified in the **SourceVolumeID** parameter must serve as secondary volumes in a remote mirror and copy relationship in which one of the conduit LSS volumes serves as a primary volume.

When this parameter is used, you must specify a fully qualified LSS ID. The fully qualified LSS ID format is *storage\_image\_ID/XX*, where *XX* is a hexadecimal number in the range 00 - 1F (1750 only).

Example: IBM.1750-68FA120/00

**-seqnum** *flash\_sequence\_number*

(Optional) Specifies that the commit operation is performed only on those source volumes that are associated with the specified sequence number.

This parameter is not supported for machine type 2105.

Example: 0010

**-srcss** *SS\_ID*

(Optional) Specifies the subsystem ID of the source logical subsystem at the remote site. When this parameter is used, all source volumes must be within the same logical subsystem.

This parameter is required only for IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: FF10

**SourceVolumeID** . . . | -

(Required) Commits remote FlashCopy relationships for the source volumes with the specified IDs. The chosen pair is the one with the enabled **-record** parameter. You must separate multiple source volume IDs with spaces.

This parameter accepts fully qualified volume IDs, which includes the storage image ID, or a shortened version without the storage image ID if either the **-dev** parameter is specified, or you can specify a value for the *dev* variable in your profile file.

The volume ID is a 32 bit number that can be represented as 4 hexadecimal digits in the form of *XYZZ* where *X* is the address group (0 - 1), *XY* together is the logical subsystem number 00 - 1E (for 1750) , and *ZZ* is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input.

Example of a fully qualified volume ID: IBM.1750-68FA120/0001

Example of a shortened version: 0001

Example of IDs: 0001 0003 0008

## Example (1750)

### Invoking the **commitremoteflash** command

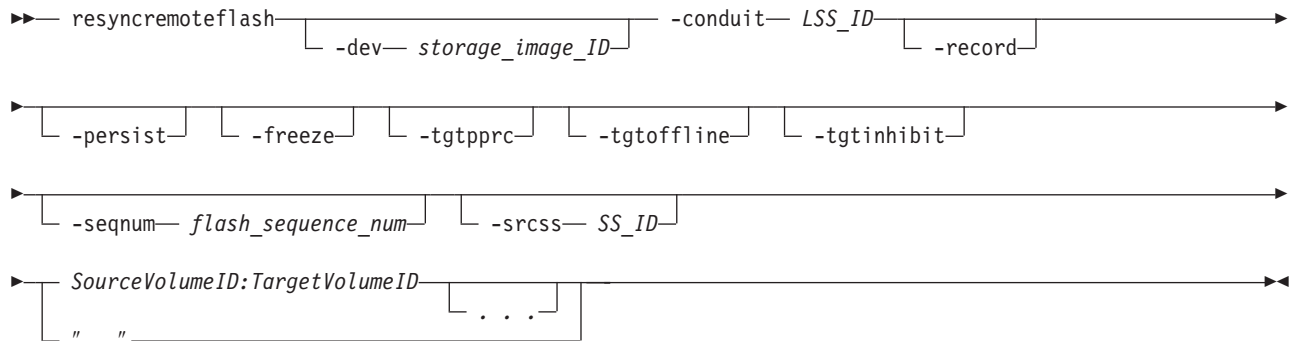
```
dsccli>commitremoteflash -conduit IBM.1750-68FA150/10 IBM.1750-68FA120/0100
```

### The resulting output

FlashCopy pair IBM.1750-68FA120/0100:IBM.1750-68FA120/0200 successfully committed.

## resyncremoteflash

The **resyncremoteflash** command (formerly called the **incremoteflash** command and associated with the incremental FlashCopy process) increments an existing remote FlashCopy pair that has been established with the **-record** and **-persist** parameters.



## Parameters

**Note:** When a pair is established with the **-record** and **-persist** parameters, the pair initially synchronizes and then a record of all data that is written from the host to the source is maintained in the source volumes. When the **resyncremoteflash** command is issued on the pair, the new data that is written to the source is copied to the target. The specified parameters in this command replace the parameters in the existing relationship. In order to keep the initial **-record** and **-persist** parameter values, the **-record** and **-persist** parameters must be specified using the **resyncremoteflash** command.

### -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source and target volumes or you do not specify a value for the *dev* variable in your profile file.

Example: IBM.1750-68FA120

### -conduit LSS\_ID

(Required) Specifies the source logical subsystem (LSS) of an existing remote mirror and copy relationship that is to be used as a means for communicating with the remote storage image. The source volume IDs that are specified in the **SourceVolumeID:TargetVolumeID** parameter, must serve as secondary volumes in a remote mirror and copy relationship in which one of the conduit LSS volumes serves as a primary volume.

When you use this parameter, you must specify a fully qualified LSS ID. The fully qualified LSS ID format is *storage\_image\_ID/XX*, where XX is a hexadecimal number in the range 00 - 1F (1750 only).

Example: IBM.1750-68FA120/00



**-record**

(Optional) Specifies that the changed tracks on both volumes within a FlashCopy pair be recorded. Select this parameter if you intend to use the **resyncremoteflash** command again with this pair. The **-persist** parameter is automatically set in the code when the **-record** parameter is specified.

**-persist**

(Optional) Specifies that the FlashCopy relationship be retained after the background copy completes. The FlashCopy relationship between the source and the target volumes remains indefinitely until you issue a **rmremoteflash** command. This parameter is automatically set in the code when the **-record** parameter is specified.

Specify this parameter along with the **-record** parameter if you intend to use this volume pair with the **resyncremoteflash**, **reverseremoteflash**, or **setremoteflashrevertible** commands.

**-freeze**

(Optional) Specifies the Freeze Consistency Group condition. This option causes the source volume to be busy (Queue Full status on Open Systems) to all host I/O operations until a FlashCopy Consistency Group Created command is received. All writes to the source volume are queued by the host and are written after the Consistency Group Created command is complete.

During the busy condition, the source volume reports Queue Full for fixed block volumes and busy status for CKD volumes.

The busy condition can also be reset by an *extended long busy timeout* (default 120 seconds). The timeout condition affects all FlashCopy source volumes that are contained within a respective logical subsystem and that are established or modified with the **-freeze** parameter.

**Note:** This parameter is used in conjunction with other processing steps for purposes such as backups, testing, or recovery solutions. The use of this parameter ensures that volumes on the target LSSs are consistent with the source LSSs volumes.

**-tgtpprc**

(Optional) Allows the FlashCopy target volume to be a remote mirror and copy source volume.

**-tgtoffline**

(Optional) Causes the **resyncremoteflash** command to be rejected if the target volume is online for host system access.

**Note:** This parameter applies only to count key data volumes.

**-tgtinhibit**

(Optional) Prevents host system write operations to the target while the FlashCopy relationship exists.

**-seqnum** *flash\_sequence\_num*

(Optional) Associates the FlashCopy relationships that are established with the specified sequence number. You can use this sequence number as an identifier for a relationship or group of relationships. Only the relationships that are modified successfully by the **resyncremoteflash** command are assigned the specified sequence number, leaving the ones that fail with the previous one (if they were previously specified).

This parameter is not supported for machine type 2105.



Example: 0010

**-srcss *SS\_ID***

(Optional) Specifies the subsystem ID of the source logical subsystem at the remote site. The subsystem ID is a four-digit hexadecimal number in the range (0001 - FFFF). When this parameter is used, all source volumes must be designated within the same logical subsystem.

This parameter is required for IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: FF10

***SourceVolumeID:TargetVolumeID . . . | -***

(Required) Specifies that a remote FlashCopy relationship for the source and target volume pairs be incremented with the designated IDs. This parameter accepts fully qualified volume IDs, which includes storage image IDs or a shortened version without storage image IDs, if the **-dev** parameter is specified,

A FlashCopy pair ID consists of two volume IDs: one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The volume ID is a 32-bit number that can be represented as 4 hexadecimal digits in the form of *XYZZ*, where *X* is the address group (0 - 1), *XY* together is the logical subsystem number 00 - 1E (for 1750) , and *ZZ* is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input. You cannot use the dash (-) while you are in the DS CLI interactive command mode.

Example of a fully qualified FlashCopy pair ID: IBM.1750-68FA120/  
0001:IBM.1750-68FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

## Example (1750)

### Invoking the **resyncremoteflash** command

```
dscli>resyncremoteflash
-conduit IBM.1750-68FA150/10 IBM.1750-68FA120/0100:IBM.1750-68FA120/0200
```

### The resulting output

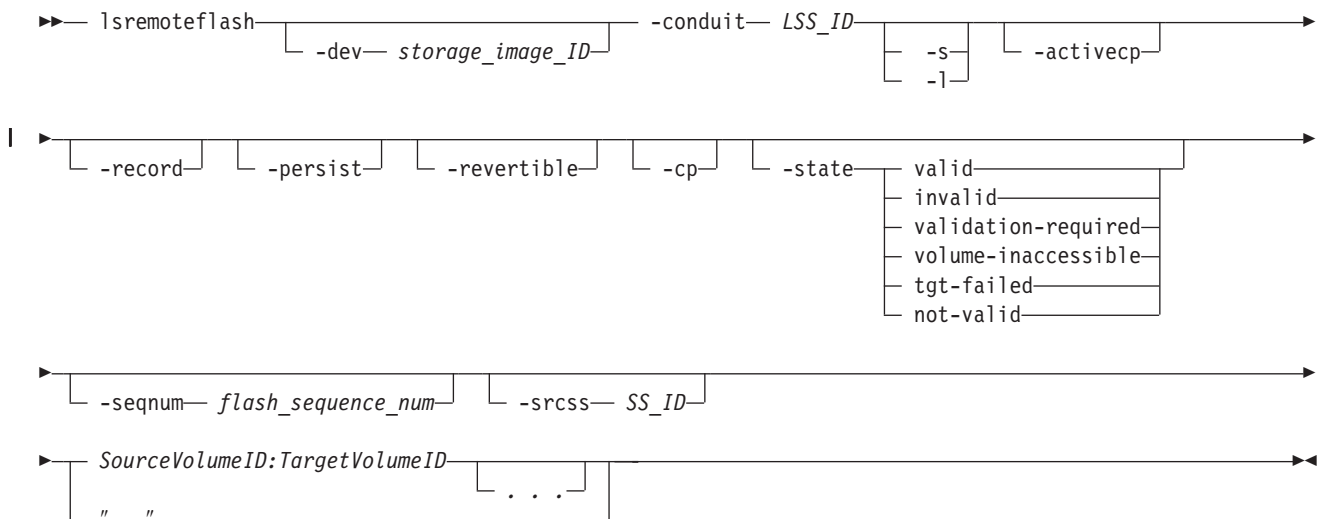
```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

```
Remote FlashCopy volume pair 0100:0200 successfully resynchronized.
Use the lsremoteflash command to determine copy completion.
```

**Note:** This message is returned before the copy completes.

### **lsremoteflash**

The **lsremoteflash** command displays a list of FlashCopy relationships and status information for each FlashCopy relationship in the list.



## Parameters

**Note:** All settings apply to all FlashCopy pairs that are specified.

### **-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which consists of manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source and target volumes or you do not specify a value for the *dev* variable in your profile file.

### **-conduit** *LSS\_ID*

(Required) Specifies the source logical subsystem (LSS) of an existing Remote Mirror and Copy relationship that is used as a means for communicating with the remote storage image.

The source volume IDs that are specified in the *SourceVolumeID:TargetVolumeID* parameter must serve as secondary volumes in a Remote Mirror and Copy relationship in which one of the conduit LSS volumes serves as a primary volume.

This parameter accepts a fully qualified LSS ID, which includes the storage image ID. The fully qualified LSS ID format is *storage\_image\_ID/XX*, where *XX* is a hexadecimal number in the range 00 - 1F (1750 only).

**-s** (Optional) Specifies that FlashCopy pair IDs be displayed. You cannot use the **-l** and the **-s** parameters together.

**-l** (Optional) Specifies that the default detailed output plus Out-of-Sync Tracks and Date Created information be displayed. You cannot use the **-l** and the **-s** parameters together.

### **-activecp**

(Optional) Specifies that FlashCopy relationships where their background copy process is active be displayed.

### **-record**

(Optional) Specifies that the FlashCopy relationships that were established with the **-record** parameter be displayed.

### **-persist**

(Optional) Specifies that the FlashCopy relationships that were established with the **-persist** parameter be displayed.

**-revertible**

(Optional) Specifies that the FlashCopy relationships that were established with the **-revertible** parameter be displayed.

**-cp**

(Optional) Specifies that the FlashCopy relationships that were established with the run background copy (**-cp**) parameter be displayed.

**-state valid | invalid | validation-required | volume-inaccessible | tgt-failed | not-valid**

(Optional) Displays the FlashCopy relationships that are identified by the specific state.

**Note:** When you specify **not-valid**, all FlashCopy relationships that do not meet the requirements for the **valid** state are displayed.

**-seqnum** *flash\_sequence\_number*

(Optional) Specifies that the FlashCopy relationships that are associated with the specified sequence number be displayed.

This parameter is not supported for machine type 2105.

**-srcss** *SS\_ID*

(Optional) Specifies the subsystem ID of the source logical subsystem at the remote site. The ID is in the format 0x0001 - 0xFFFF.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1. When you specify *SS\_IDs*, the source volumes are restricted to one LSS.

Example: FF10

**SourceVolumeID:TargetVolumeID . . . | -**

(Required) Specifies that the FlashCopy relationships for the source and target volume pairs with the specified IDs be displayed.

This parameter accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the **-dev** parameter is specified.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

You must separate multiple IDs with spaces. You can specify FlashCopy pair IDs and a range of FlashCopy pair IDs, or you can specify volume IDs and a range of volume IDs. You cannot specify a combination of FlashCopy pair IDs and volumes IDs.

The volume ID is a 32-bit number that can be represented as 4 hexadecimal digits in the form of XYZZ, where X is the address group (0 - 1), XY together is the logical subsystem number 00 - 1E (for 1750) , and ZZ is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input. You cannot use the dash (-) while you are in the DS CLI interactive command mode.

Example of a fully qualified volume ID pair: IBM.1750-75FA120/  
0001:IBM.1750-68FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **lsremoteflash** command using the **-l** parameter. A separate example is not shown for the 1750 as the information is the same for both. The only difference is the machine type designation, 2107 versus 1750.

### Invoking the lsremoteflash command

```
dscli>lsremoteflash -l -dev IBM.2107-75FA120
-conduit IBM.2107-75FA150/10 IBM.2107-75FA120/0100:IBM.2107-75FA120/0200
```

### The resulting output

Date/Time: Sun Jan 09 02:23:49 PST 2005 DS CLI Version: 5.0.0.0  
DS: IBM.2107-75FA120

| ID        | SrcLSS | SequenceNum | ActiveCopy | Recording | Persistent | Revertible |
|-----------|--------|-------------|------------|-----------|------------|------------|
| 0100:0200 | 01     | 10          | Disabled   | Disabled  | Disabled   | Disabled   |

## Report field definitions

**ID** Specifies the FlashCopy pair ID. The FlashCopy pair ID consists of two volume IDs. One is designated as the source and the other is the target volume for a FlashCopy relationship.

**SrcLSS** Specifies the logical subsystem ID.

**SequenceNum** Specifies the sequence number that is associated with the FlashCopy relationship.

**ActiveCopy** Specifies (enabled or disabled) whether the background copy is active on the specified FlashCopy pair.

**Recording** Specifies (enabled or disabled) whether the designated FlashCopy pair is established with recording activated.

**Persistent** Specifies (enabled or disabled) whether the designated FlashCopy pair is established with persistent activated.

**Revertible** Specifies (enabled or disabled) whether the designated FlashCopy pair is established with the revertible option activated.

**SourceWriteEnabled** Specifies (enabled or disabled) whether or not this FlashCopy relationship was established with the Allow Source Writes option.

**TargetWriteEnabled**

Specifies (enabled or disabled) whether this FlashCopy relationship was established with the Allow Target Writes option

**BackgroundCopy**

Specifies (enabled or disabled) whether this FlashCopy relationship was established with the Run Background Copy option.

**OutofSyncTracks**

Specifies the number of tracks that are not synchronized for this FlashCopy relationship.

**DateCreated**

Specifies the date and the time that the FlashCopy relationship was established.

**DateSynced**

Specifies the date and the time that this FlashCopy relationship was synchronized, or null (-) if the relationship is not synchronized.

**State** Specifies the state of the FlashCopy relationships. One of the following values is displayed for each FlashCopy relationship:

**Note:** When a query indicates any state other than valid, the only information that is displayed on the report is the FlashCopy pair ID and the state condition. The rest of the information columns are displayed with a null (-) value.

**Valid** Indicates that the FlashCopy relationship is in a normal state, and that it has been queried successfully.

**Validation Required**

Indicates that the FlashCopy relationship cannot be queried. Generally, the reason that the query is blocked is only temporary. If you issue a new query within several seconds, the problem no longer exists.

**Tgt Failed**

Indicates that the FlashCopy relationship is in an error state. The point-in-time copy is lost, and the FlashCopy relationship must be withdrawn. You must issue the **rmflash** command to remove the FlashCopy relationship.

**Volume Inaccessible**

Indicates that the volume cannot be accessed and that the query has failed. When this state is displayed, it generally means that the volume is in a fenced condition.

**Invalid**

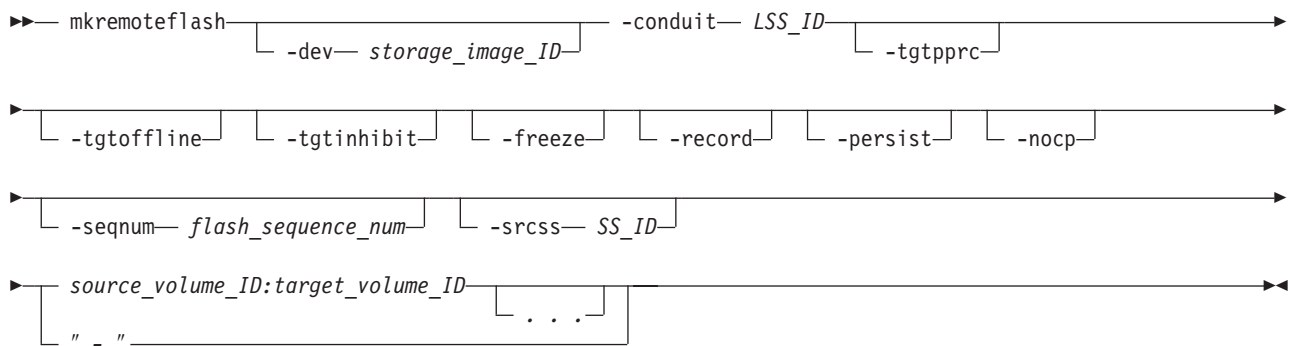
Indicates that a general internal error has occurred when the query is processed.

**Path Unavailable**

The specified inband path does not exist. The user should verify that the Remote Mirror and Copy pair exists.

**mkremoteflash**

The **mkremoteflash** command initiates a remote point-in-time copy from source volumes to target volumes through a Remote Mirror and Copy relationship.



## Parameters

### **-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source and target volumes or you do not specify a value for the *dev* variable in your profile file.

### **-conduit** *LSS\_ID*

(Required) Specifies the source logical subsystem (LSS) of an existing remote mirror and copy relationship that is to be used as a conduit for communicating with the remote storage image. The source volume IDs that are specified in the **SourceVolumeID:TargetVolumeID** parameter, must serve as secondary volumes in a remote mirror and copy relationship in which one of the conduit LSS volumes serves as a primary volume.

When you use this parameter, you must specify a fully qualified LSS ID. The fully qualified LSS ID format is *storage\_image\_ID/xx*, where *xx* is a hexadecimal number of 00 - 1F (1750 only).

Example: IBM.1750-68FA120/00

### **-tgtpprc**

(Optional) Allows the FlashCopy target volume to be a remote mirror and copy source volume.

### **-tgtoffline**

(Optional) Causes the **mkremoteflash** command to be rejected if the target volume is online for host system access. This parameter applies only to CKD volumes.

### **-tgtinhibit**

(Optional) Prevents host system write operations to the target while the FlashCopy relationship exists.

### **-freeze**

(Optional) Specifies the Freeze Consistency Group condition. The use of this parameter triggers the *queue full* condition for the source volume. All writes to the source volume are queued by the host and are written after the *queue full* condition is reset.

During the *queue full* condition, the source volume reports *long busy* status.

The *queue full* condition is reset by an *extended long busy timeout* condition. The timeout condition affects all FlashCopy source volumes that are contained within a respective logical subsystem and that are established or modified with the **-freeze** parameter.

**Note:** This parameter is used with other processing steps for purposes such as backups, testing, or recovery solutions. The use of this parameter ensures that volumes on the target LSSs are consistent with the source LSSs volumes.

**-record**

(Optional) Specifies that the changed tracks on both volumes within a FlashCopy pair be recorded. Select this parameter if you intend to use the **resyncremoteflash** command again with this pair. The **-persist** parameter is automatically selected when the **-record** parameter is specified.

**-persist**

(Optional) Specifies that you want to retain the FlashCopy relationship after the background copy completes. The FlashCopy relationship between the source and the target volumes remains indefinitely until you issue a **rmremoteflash** command. This parameter is automatically selected when the **-record** parameter is specified.

Specify this parameter along with the **-record** parameter if you intend to use this volume pair with the **resyncremoteflash**, **reverseremoteflash**, or **setremoteflashrevertible** commands.

**-nocp**

(Optional) Inhibits background copy. Data will be copied from the source volume to the target volume only if a track on the source volume is modified. The FlashCopy volume pair relationship remains indefinitely until it is broken by a **rmremoteflash** command, or until all tracks on the source volume are modified.

**-seqnum** *flash\_sequence\_num*

(Optional) Associates the FlashCopy relationships that are established with the specified sequence number. This sequence number can be used as an identifier for a relationship or group of relationships.

Example: 0010

This parameter is not supported for machine type 2105.

**-srcss** *SS\_ID*

(Optional) Specifies the subsystem ID of the source logical subsystem at the remote site. The ID is in the format 0x0001 - 0xFFFF.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1. When you specify *SS\_IDs*, the source volumes are restricted to one LSS.

Example: FF10

**SourceVolumeID:TargetVolumeID . . . | -**

(Required) Specifies that a remote FlashCopy relationship for the source and target volume pairs be incremented with the designated IDs. This parameter accepts fully qualified volume IDs, which includes the storage image IDs or a shortened version without storage image IDs, if the **-dev** parameter is specified.

A FlashCopy pair ID consists of two volume IDs: one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The volume ID is a 32-bit number that can be represented as 4 hexadecimal digits in the form of *XYZZ*, where *X* is the address group (0 - 1), *XY* together is the logical subsystem number 00 - 1E (for 1750) , and *ZZ* is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input. You cannot use the dash (-) while you are in the DS CLI interactive command mode.

Example of a fully qualified FlashCopy pair ID: IBM.1750-68FA120/0001:IBM.1750-68FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

### Example (1750)

#### Invoking the mkremoteflash command

```
dscli>mkremoteflash -dev IBM.1750-68FA120
-conduit IBM.1750-68FA150/10 0100:0200
```

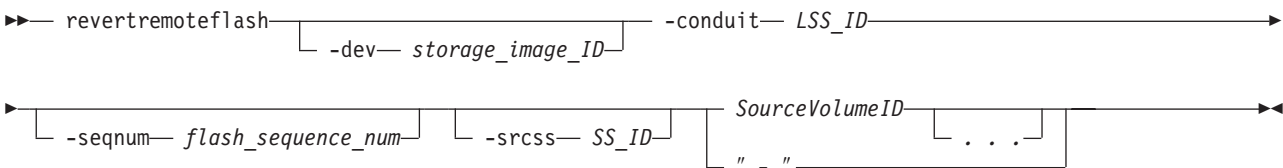
#### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

FlashCopy volume pair 0100:0200 successfully created.  
Use the lsremoteflash command to determine copy completion.

#### revertremoteflash

The **revertremoteflash** command is used to restore data on the source volume to its most recent consistency formation. All new write operations to the source since the most recent consistency formation are overwritten with the previous consistency.



### Parameters

You must take the following actions before you can use the **revertremoteflash** command:

#### Notes:

1. Issue the **mkflash** or **mkremoteflash** command with the **-persist** and **-record** parameters to establish the FlashCopy pair.
2. Issue the **setflashrevertible** or **setremoteflashrevertible** command against the FlashCopy pair.

#### **-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source volume or you do not specify a value for the *dev* variable in your profile file.



**-conduit *LSS\_ID***

(Required) Specifies the source logical subsystem (LSS) of an existing remote mirror and copy (formerly PPRC) relationship that is used as a means for communicating with the remote storage image. The source volume IDs that are specified in *SourceVolumeID:TargetVolumeID* must serve as secondary volumes in a remote mirror and copy relationship in which one of the conduit LSS volumes serves as a primary volume.

When you use this parameter, you must specify a full qualified LSS ID. The fully qualified LSS ID format is *storage\_image\_ID/XX*, where XX is a hexadecimal number in the range 00 - 1F (1750 only).

Example: IBM.2107-75FA120/00

Example: IBM.1750-68FA120/00

**-seqnum *flash\_sequence\_num***

(Optional) When a FlashCopy sequence number is specified, the **revertremoteflash** operation is performed only on those relationships that are associated with the specified number.

Example: 0010

This parameter is not supported for machine type 2105.

**-srcss *SS\_ID***

(Optional) Specifies the subsystem ID of the source logical subsystem at the remote site. The ID is in the format 0x0001 - 0xFFFF.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1. 3. When you specify *SS\_IDs*, the source volumes are restricted to one logical subsystem.

Example: FF10

***SourceVolumeID* . . . | -**

(Required) Specifies the remote FlashCopy relationship for the source volume with the specified ID that is to be reverted. The chosen FlashCopy pair is the one that is established or modified with the **-record** parameter.

This parameter accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the **-dev** parameter is specified. You must separate multiple source volume IDs with spaces.

The volume ID is a 32-bit number that can be represented as 4 hexadecimal digits in the form of XYZZ where X is the address group (0 - 1), XY together is the logical subsystem number 00 - 1E (for 1750) , and ZZ is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input.

Example of a shortened version: 0001

Example of multiple IDs: 0001 0003 0008

## Example (1750)

### Invoking the revertremoteflash command

```
dscli>revertremoteflash -dev IBM.1750-68FA120
-conduit IBM.1750-68FA150/10 0100
```

### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120

Remote FlashCopy volume pair 0100:0200 successfully reverted.

## rmremoteflash

The **rmremoteflash** command removes a relationship between remote FlashCopy volume pairs.

```
rmremoteflash [-dev storage_image_ID] [-conduit LSS_ID] [-quiet] [-tgtonly]
 [-cp] [-seqnum flash_sequence_number] [-srcss SS_ID]
 SourceVolumeID:TargetVolumeID
 " _ " . . .
```

## Parameters

### Notes:

1. Invoking this command and using the **-cp** parameter on a FlashCopy relationship that was previously marked with the **-persist** parameter does not remove the relationship. Instead, the source volume is copied to the target volume.
2. Invoking this command resets the **-tgtinhibit** parameter option if it was previously set.
3. All settings apply to all specified FlashCopy pairs.
4. The **-seqnum** parameter is not supported for model 2105.
5. When SS\_IDs are specified, the source volumes are restricted to 1 LSS.

### **-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source and target volumes or you do not specify a value for the *devid* variable in your profile file.

### **-conduit** *LSS\_ID*

(Required) Specifies the source logical subsystem (LSS) of an existing remote mirror and copy (formerly PPRC) relationship that is to be used as a means for communicating with the remote storage image. The source volume IDs that are specified in *SourceVolumeID:TargetVolumeID* must serve as secondary volumes in a remote mirror and copy relationship in which one of the conduit LSS volumes serves as a primary volume.

This parameter allows the use of a fully qualified LSS ID, which includes the storage image ID. The fully qualified LSS ID format is *storage\_image\_ID/XX*, where *xx* is a hexadecimal number in the range 00 - 1F (1750 only).

### **-quiet**

(Optional) Turns off the confirmation prompt for this command.

### **-tgtonly**

(Optional) Specifies only the target volume of the remote FlashCopy pair that you want to remove. In addition, the copy indicator for the target volume is reset.

**Note:** You can use this parameter only with fixed block volumes.

**-cp**

(Optional) Specifies that the FlashCopy relationship be changed from the *No Copy* to the *Copy* mode. Additionally the remaining source volume tracks are copied to the target volume. The relationship is removed when all the data is copied unless the relationship is persistent. When the **-cp** parameter is specified, the copy is processed for all volume pairs where the source volume ID is identical to the source volume that is specified in the command.

**-seqnum** *flash\_sequence\_num*

(Optional) When a FlashCopy sequence number is specified, the **rmremoteflash** operation is performed only on those relations that are associated with the specified number.

Example: 0010

This parameter is not supported for machine type 2105.

**-srcss** *SS\_ID*

(Optional) Specifies the subsystem ID of the source logical subsystem at the remote site. The ID is in the format 0x0001 - 0xFFFF.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1. 4. When you specify *SS\_IDs*, the source volumes are restricted to one logical subsystem.

Example: FF10

*SourceVolumeID:TargetVolumeID . . . | -*

(Required) Specifies the remote FlashCopy relationships for the source and target volume pairs with the specified IDs that are to be removed.

This parameter accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the **-dev** parameter is specified. You must separate multiple FlashCopy pair IDs with spaces.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume. When you use the **-tgtonly** parameter, enter volume IDs. Volume pair IDs cannot be used with the **-tgtonly** parameter.

The volume ID is a 32-bit number that can be represented as 4 hexadecimal digits in the form of XYZZ, where X is the address group (0 - 1), XY is the logical subsystem number 00 - 1E (for 1750) , and ZZ is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input. You cannot use the dash (-) while you are in the DS CLI interactive command mode.

Example of a fully qualified FlashCopy pair ID: IBM.1750-75FA120/  
0001:IBM.1750-68FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

## Example (1750)

### Invoking the `rmremoteflash` command

```
dscli>rmremoteflash -dev IBM.1750-68FA120
-conduit IBM.1750-68FA150/10 0100:0200
```

### The resulting output

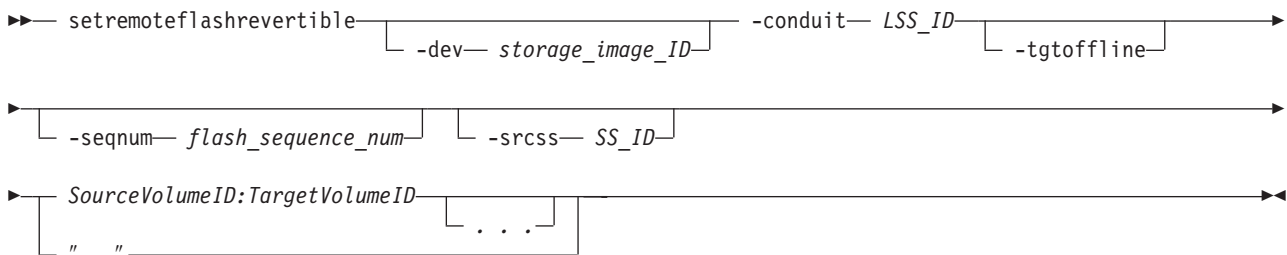
```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

```
Are you sure you want to remove the FlashCopy pair 0100:0200? [y/n]: Y
```

```
Removal of the remote FlashCopy volume pair 0100:0200 has been initiated
successfully. Use the lsremoteflash command to determine when the
relationship is deleted.
```

### `setremoteflashrevertible`

The `setremoteflashrevertible` command modifies a remote FlashCopy volume pair that is part of a FlashCopy relationship to *revertible*. When a pair is revertible, the data can be committed to the target to form a new consistency group, or it can be reverted back to the last consistency group. This command must be run before the FlashCopy pair can be committed or reverted.



## Parameters

**Note:** The `-nocp`, `-record`, `-persist`, and `-tgtinhibit` (target inhibit) parameters that were specified when the FlashCopy pair was made (`mkremoteflash` command) are included automatically when the `setremoteflashrevertible` command processes.

#### `-dev storage_image_ID`

(Optional) Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source volume or you do not specify a value for the *dev* variable in your profile file.

#### `-conduit LSS_ID`

(Required) Specifies the source logical subsystem (LSS) of an existing remote mirror and copy relationship that is to be used as a passage for communicating with the remote storage image. The source volume IDs that are specified in *SourceVolumeID:TargetVolumeID* must serve as secondary volumes in a remote mirror and copy relationship in which one of the passage LSS volumes serves as a primary volume.

When you use this parameter, you must specify a fully qualified LSS ID. The fully qualified LSS ID format is *storage\_image\_ID/XX*, where XX is a hexadecimal number in the range 00 - 1F (1750 only).

### **-tgtoffline**

(Optional) Causes an establish FlashCopy volume pair command to be rejected if the target volume ID is online for host system access.

This parameter applies only to CKD volumes.

### **-seqnum** *flash\_sequence\_num*

(Optional) Associates the remote FlashCopy relationships that are changed with the specified sequence number. Only the relationships that are successfully modified by the command get the specified sequence number, leaving the ones that failed with the previous number (if previously specified).

Example: 0010

This parameter is not supported for machine type 2105.

### **-srcss** *SS\_ID*

(Optional) Specifies the subsystem ID of the source logical subsystem at the remote site. The ID is in the format 0x0001 - 0xFFFF.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: FF10

### *SourceVolumeID:TargetVolumeID . . . | -*

(Required) Specifies that the remote FlashCopy relationships for the designated source and target volume pairs be modified.

This parameter accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the **-dev** parameter is specified. You must separate multiple FlashCopy pair IDs with spaces.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The volume ID is a 32-bit number that can be represented as 4 hexadecimal digits in the form of XYZZ, where X is the address group (0 - 1), XY together is the logical subsystem number 00 - 1E (for 1750) , and ZZ is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input. You cannot use the dash (-) while you are in the DS CLI interactive command mode.

Example of a fully qualified FlashCopy pair ID: IBM.1750-75FA120/  
0001:IBM.1750-75FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

## **Example (1750)**

### **Invoking the setremoteflashrevertible command**

```
dscli>setremoteflashrevertible -dev IBM.1750-68FA120 0100:
```

### **The resulting output**

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120

Remote FlashCopy pair 0100:0200 successfully made revertible.

## Remote Mirror and Copy path commands

This section contains commands that create and delete Remote Mirror and Copy (formerly PPRC) paths and display Remote Mirror and Copy path information.

Use the following commands to create and delete Remote Mirror and Copy paths and to display Remote Mirror and Copy path information:

- **lsavailpprcport**
- **lspprcpath**
- **mkesconpprcpath**
- **mkpprcpath**
- **rmpprcpath**

The **lsavailpprcport** command generates a report that displays a list of ESCON or fibre-channel I/O ports that can be defined as Remote Mirror and Copy paths.

The **lspprcpath** command generates a report that displays a list of existing Remote Mirror and Copy path definitions.

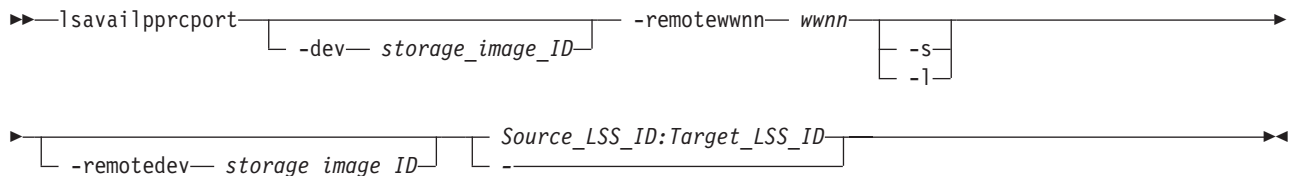
The **mkesconpprcpath** command creates a Remote Mirror and Copy path between source and target logical subsystems over an ESCON connection.

The **mkpprcpath** command establishes or replaces a Remote Mirror and Copy path between source and target logical subsystems (LSSs) over a fibre-channel connection.

The **rmpprcpath** command deletes one or more specified Remote Mirror and Copy paths.

### lsavailpprcport

The **lsavailpprcport** command displays a list of ESCON or fibre-channel I/O ports that can be defined as remote mirror and copy (formerly PPRC) paths. The DS6000 supports only fibre-channel ports. The Enterprise Storage Server (2105 machine type) supports ESCON ports.



### Parameters

**-dev storage\_image\_ID**

(Optional). Specifies the source volume storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source logical subsystem.

Example: IBM.1750-68FA120

**-remotewwnn** *wwnn*

(Required). Specifies the worldwide node name (WWNN). The format is a 16-hexadecimal ID.

**Note:** You want to use the WWNN that is associated with the remote storage image. Run the **lssi** or **showsi** command to obtain this number. If you use the WWNN that is associated with the primary storage unit, this command fails.

WWNN example: 12341234000A000F

**-s** (Optional). Displays the local port ID. You cannot use the **-l** and the **-s** parameters together.

**-l** (Optional). Displays all fields. You cannot use the **-l** and the **-s** parameters together.

**-remotedev** *storage\_image\_ID*

(Required or Optional). Specifies the remote storage unit that contains the I/O ports that are queried by the *Source\_LSS\_ID:Target\_LSS\_ID* parameter. The remotedev ID consists of the value for the manufacturer, machine type, and serial number.

Required - This parameter is required when querying ESCON I/O ports unless a fully qualified target logical subsystem ID is specified.

Optional - This parameter is optional if you are querying fibre channel I/O ports.

**Note:** If specified the format of this entry might be checked for correctness even though the value is not used.

Example: IBM.1750-68FA120

*Source\_LSS\_ID:Target\_LSS\_ID* | -

(Required). Queries I/O ports that are available for a remote mirror and copy path relationship for the source and target LSSs. This parameter accepts fully qualified LSS IDs, which includes the storage image ID or shortened version without the storage image ID, if the **-dev** parameter is specified.

A remote mirror and copy path LSS pair ID consists of two LSS IDs, one designated as the source LSS and the other as the target LSS for a remote mirror and copy path relationship. The two LSS IDs must be separated with a colon and no spaces. The first LSS ID is the source LSS. The second LSS ID is the target LSS.

The fully qualified LSS ID format is *storage\_image\_ID/xx*, where 'xx' is a hexadecimal number in the range 00 - 1F (1750 only). For example, IBM.1750-68FA120/01:IBM.1750-68FA150/01

If you do not use the **-dev** and **-remotedev** parameters, the fully qualified **source\_LSS\_ID:target\_LSS\_ID** value must be placed after the **-remotewwnn** value in your command line. For example, your command line would look like the following:

```
dscli>lsavailpprcport -l -remotewwnn 12341234000A000F
IBM.1750-68FA120/01:IBM.1750-68FA150/01
```

If you use the dash (-), the specified value is read from standard input.

Example pair: 00:00

Example of multiple pairs: 00:00 01:01 02:02



## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **lsavailpprcport** command using the **-l** parameter. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the machine type designation, 2107 versus 1750.

### Invoking the lsavailpprcport command

```
dscli>lsavailpprcport -l -dev IBM.2107-75FA120
 -remotewwnn 12341234000A000F 01:01
```

### The resulting output

ESCON port information displays for the 2105 machine type.

| Local port | Attached port | Type         | Switch ID                | Switch port |
|------------|---------------|--------------|--------------------------|-------------|
| I0100      | I0200         | FCP          | N/A                      | N/A         |
| I0150      | I0620         | ESCON        | N/A                      | N/A         |
| I0200      | N/A           | ESCON Switch | IBM.111.2222.<br>75113AB | I10         |
| I0250      | N/A           | ESCON Switch | IBM.111.2222.<br>75113AB | I20         |

## Report field descriptions

### Local port

Specifies the fully qualified unique Port ID on the local storage unit. FCP and ESCON port IDs are displayed as follows:

#### FCP port ID

Four hexadecimal characters in the format 0xEEAP, where 'EE' is a port enclosure number (00 - 3F), 'A' is the adapter number (0 - F), and 'P' is the port number (0 - F). The FCP port ID number is prefixed with the letter I.

#### ESCON port ID

Four hexadecimal characters in the format 0xEEAP, where 'EE' is a port enclosure number (04 - 07), 'A' is the adapter number (0 - 3), and 'P' is the port number (0 - 1). The ESCON port ID number is prefixed with the letter I.

**Note:** When you specify the **-s** parameter, the local port information is the only information displayed on the report.

### Attached port

Specifies the fully qualified unique Port ID on the attached storage unit. FCP and ESCON port ID numbers are displayed in the format that is described for Local port. However, if there is an ESCON Switch value, the value displayed in this column is **N/A** (not applicable).

**Type** Specifies the connection type. FCP is the only applicable value for a 2107 or 1750 machine type. For a 2105 machine type, you can have a value of ESCON or ESCON Switch.



## Switch ID

Specifies the Switch ID for ESCON Switch connections.

**Note:** For FCP and direct ESCON, the displayed value in this field is **N/A** (not applicable).

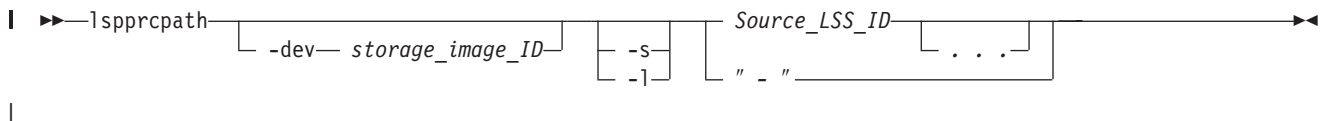
## Switch port

Specifies the Port ID on the Switch device that is connected to the attached ESS. The Switch port ID component is two hexadecimal characters in the format 0xPP, where 'PP' is a port number (00 - ff). The number is prefixed with the letter I.

**Note:** For FCP and direct ESCON, the value of this field is N/A (not applicable).

## Ispprcpath

The **lspprcpath** command displays a list of existing remote mirror and copy path definitions.



## Parameters

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which consists of values for the manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source LSS ID.

Example: IBM.1750-68FA120

- s (Optional) Displays the default output of the report but does not include the *Failed Reason* column. You cannot use the -l and the -s parameters together.

-1 (Optional) Displays the default output and the *Failed Reason* descriptions. You cannot use the -l and the -s parameters together.

Source\_LSS\_ID . . . | -

(Required) Specifies that the Remote Mirror and Copy paths that are defined for the specified source LSS IDs be displayed.

This parameter accepts either a fully qualified LSS ID, including the storage image ID, or a shortened version if the **-dev** parameter is specified. The fully qualified LSS ID format is *storage\_image\_id/xx*, where *xx* is a logical subsystem (LSS) hexadecimal number 00 - 1F (for 1750).

You must separate multiple LSS IDs with spaces.

If you use the dash (-), the specified value is read from standard input.

Example: 00

Example of multiple source LSS IDs: 00 01 02

### Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report when the **-l** parameter is used with the **lspprcpath** command. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the machine type designation, 2107 versus 1750.

### Invoking the lspprcpath command

```
dscli>lspprcpath -dev IBM.2107-75FA120 -l 10
```

### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0  
DS: IBM.2107-75FA120

| Src                         | Tgt                         | State   | SS   |
|-----------------------------|-----------------------------|---------|------|
| IBM.2107<br>-75FA120<br>/10 | IBM.2107<br>-75FA150<br>/10 | Failed  | 0010 |
| IBM.2107<br>-75FA120<br>/10 | IBM.2107<br>-75FA150<br>/11 | Success | 0011 |
| IBM.2107<br>-75FA120<br>/10 | IBM.2107<br>-75FA150<br>/12 | Success | 0012 |
| IBM.2107<br>-75FA120<br>/10 | IBM.2107<br>-75FA150<br>/13 | Invalid | 0013 |

| Port                           | Attached Port                  | Tgt WNN               | Failed Reason              |
|--------------------------------|--------------------------------|-----------------------|----------------------------|
| IBM.2107<br>-75FA120<br>/IO100 | IBM.2107<br>-75FA150<br>/IO100 | 3007ACF<br>3012399E0  | Configur<br>ation<br>Error |
| IBM.2107<br>-75FA120<br>/IO100 | IBM.2107<br>-75FA150<br>/IO100 | 3007ACF-<br>3012399E0 | -                          |
| IBM.2107<br>-75FA120<br>/IO100 | IBM.2107<br>-75FA150<br>/IO100 | 3007ACF-<br>3012399E0 | -                          |
| IBM.2107<br>-75FA120<br>/IO100 | IBM.2107<br>-75FA150<br>/IO100 | 3007ACF-<br>3012399E0 | -                          |

### Report field definitions

**Src** Specifies the fully qualified logical subsystem ID.

**Tgt** Specifies the fully qualified remote mirror and copy ID for the path target LSS.

**State** Displays the current remote mirror and copy path state. One of the following values can be displayed:

**Failed** The transaction failed for one of the specified reasons. See the Failed Reason column for an explanation.

#### Success

The transaction was a success. When this is the State value, the Failed Reason code displays a null (-) value.

#### Invalid

The transaction was not valid. When this is the State value, the Failed Reason code displays a null (-) value.

**SS** Specifies the subsystem identifier (SSID) of the target LSS.

**Port** Specifies the fully qualified unique Port ID for the source storage unit.

The port ID component is four hexadecimal characters in the format *EEAP*, where *EE* is a port enclosure number (00 - 3F), *A* is the adapter number (0 - F), and *P* is the port number (0 - F). The number is prefixed with the letter *I*.

#### Attached Port

Specifies the fully qualified unique Port ID for the attached secondary storage unit.

The port ID component is four hexadecimal characters in the format *0xEEAP*, where *EE* is a port enclosure number (00 - 3F), *A* is the adapter number (0 - F), and *P* is the port number (0 - F). The number is prefixed with the letter *I*.

#### Tgt WWNN

Specifies the worldwide node name of the remote storage image.

#### Failed Reason

Specifies the reason for a failed transaction. You must issue the **lspprcpath** command with the **-I** parameter to see the values displayed in this field. If the State field has a value of Invalid or Success, a null (-) value is displayed in this field. When the State field displays a value of **Failed**, one of the following values is displayed:

##### Configuration Error

A path has failed for one of the following reasons:

- The specification of the SA ID does not match the installed ESCON adapter cards in the primary controller.
- For ESCON paths, the secondary control unit destination address is zero and an ESCON Director (switch) was found in the path.
- For ESCON paths, the secondary control unit destination address is nonzero and an ESCON Director does not exist in the path. That is, the path is a direct connection.

Delete the original entry and resubmit the **mkpprcpath** command.

**Down** An FCP path has failed because of a communication or hardware failure.

##### Primary Login Exceeded

The maximum number of log ins for each source FCP path has been exceeded.

##### Retry Exceeded

The maximum number of times that the storage unit tried to reestablish FCP paths has been exceeded.

| **Secondary Login Exceeded**

| The maximum number of log ins for each FCP path to the  
| secondary LSS has been exceeded. The FCP target is unavailable.

| **Secondary Unavailable**

| An FCP path to the secondary LSS is unavailable.

| **Primary No Resources**

| No resources are available at the source site for the logical paths to  
| be established.

| **Retry** Specifies the number of attempts to reestablish path connection.

| **Secondary Mismatch**

| Specifies that there is a mismatch that involves the secondary  
| control unit sequence number or the LSS.

| **Secondary No Resources**

| Specifies that resources are not available at the secondary LSS to  
| establish logical paths.

| **Secondary LSS Mismatch**

| Specifies that there is a mismatch of the secondary control unit LSS  
| ID or a failure of the I/O that collects secondary information for  
| validation.

| **Timeout**

| Specifies that a timeout has occurred. No reason is available.

| **Not Properly Configured**

| Specifies that the primary fibre channel adapter is not configured  
| properly, or it is not loaded with the correct version of microcode.

| **Secondary Not PPRC Capable**

| Specifies that the fibre channel path from secondary adapter is not  
| capable of processing a remote mirror and copy path. This can  
| occur from one of the following reasons:

- The secondary adapter is not configured properly, or it is not loaded with the correct version of microcode.
- The secondary adapter is already a target of 32 different storage units.

| **ESCON Channel Direction**

| Specifies that the primary control unit port or link cannot be  
| converted to channel mode because a logical path is already  
| established on the port or link. The establish path operations are  
| not automatically retried within the control unit.

| **ESCON Initialization Failed**

| Specifies that initialization for the ESCON protocol has failed.

| **ESCON Link Offline**

| Specifies that the ESCON link is offline. This is caused by the lack  
| of light detection coming from a host, peer, or switch.

| **Path Degraded Due to High Failure Rate**

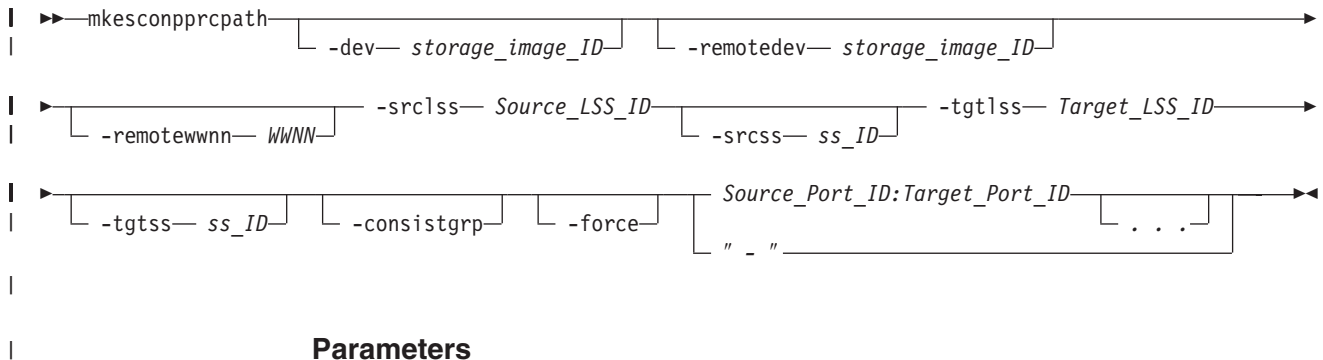
| Indicates that a fibre channel path is established; however, because  
| of the high failure rate, the path is degraded.

| **Path Removed Due to High Failure Rate**

| Indicates that the fibre channel path link has been removed  
| because the path has experienced a high failure rate.

## mkesconpprcpath

The **mkesconpprcpath** command creates a remote mirror and copy (formerly PPRC) path between source and target logical subsystems over an ESCON connection. The command allows you to specify ESCON direct and ESCON switch connections. Use this command only with IBM System Storage Enterprise Storage Servers (2105, Model 800 and Model 750).



## Parameters

### Notes:

1. The **mkesconpprcpath** command is applicable **only** for the IBM System Storage Enterprise Storage Server (2105, Model 800 and Model 750). Models 2107 and 1750 support only fibre-channel connections.
2. When you specify a switch port as the target port, specify the outgoing port that is connected to the remote ESS and not to the incoming port that is connected to the local ESS.

### **-dev** *storage\_image\_ID*

(Optional). Specifies the source storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not fully qualify the source LSS ID.

Example: IBM.2105-75FA120

### **-remotedev** *storage\_image\_ID*

(Optional). Specifies the remote storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not fully qualify the target LSS ID.

Example: IBM.2105-75FA150

### **-src lss** *Source\_LSS\_ID*

(Required). Specifies the source logical subsystem (LSS) ID. Accepts a fully qualified LSS ID, which includes the storage image ID or a shortened version without the storage image ID, if the **-dev** parameter is used. The fully qualified LSS ID format is *storage\_image\_ID/xx*, where 'xx' is a hexadecimal number in the range '00 - FE'.

### **-srcss** *ss\_ID*

(Optional). Specifies the subsystem ID of the primary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

### **-tgt lss** *Target\_LSS\_ID*

(Required). Specifies the target logical subsystem (LSS) ID. Accepts a fully

qualified LSS ID, which includes the storage image ID, or a shortened version without the storage image ID, if the **-remotedev** parameter is used. The fully qualified LSS ID format is `storage_image_ID/xx`, where 'xx' is a hexadecimal number in the range '00 - FE'.

**-remotewwnn WWNN**

(Optional). Specifies the worldwide node name. The format is a 16-hexadecimal ID.

**Note:** If you use this parameter, the format is checked even though there might be times that the value is not used.

Example: 12341234000A000F

**-tgtss ss\_ID**

(Optional). Specifies the subsystem ID of the secondary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

**-consistgrp**

(Optional). Creates a consistency group for the remote mirror and copy volume pairs that are associated with the PPRC paths that are established by this command. A remote mirror and copy consistency group is a set of remote mirror and copy volume pairs that have the same source and target LSS.

Normally, when an error occurs in a member of a remote mirror and copy volume pair, the volume is put in a *suspended* state. However, if the volume is participating in a consistency group, it is placed in a *long busy* state.

**-force**

(Optional). Creates a new remote mirror and copy path even if the specified remote mirror and copy path already exists.

`Source_Port_ID:Target_Port_ID . . . | -`

(Required). Establishes a remote mirror and copy path between the source and target ports for the specified source and target logical subsystems. The source port must be an ESCON I/O port that is configured for point-to-point or switch topology. The source port is enabled automatically for remote mirror and copy primary I/O operations. The target port must be a switch I/O port that is configured for point-to-point or switch topology. The target port is enabled automatically for remote mirror and copy primary I/O operations.

**Note:** Do not specify a target port ID when you specify an ESCON direct connection. Instead, specify only the source port ID.

This parameter accepts only non-fully qualified port IDs, which does not include the storage image ID. A remote mirror and copy path port pair ID consists of two port IDs. The first is designated as the source port and the second as the target port for the remote mirror and copy path. You must separate the two port IDs with a colon and no spaces. A direct ESCON I/O port ID is four hexadecimal characters in the format *EEAP*, where *EE* is a port enclosure number '00 - 3F', *A* is the adapter number '0 - F', and *P* is the port number '0 - F'. This number is prefixed with the letter *I*. A switch ESCON I/O port ID is two hexadecimal characters in the range '00 - FF'. This number is prefixed with the letter *I*.

This parameter accepts up to eight remote mirror and copy path port pair IDs. You must separate multiple port pair IDs with spaces.

If you use the dash (-), the specified value is read from standard input.

Example pair: I1A10:I20

Example of a source ESCON port and target switch port pair: I1A10:I20

Example of multiple pairs: I1A10:I20 I1A11:I21 I1A12 (the last object identifies an ESCON connection)

## Example (2105 use only)

### Invoking the mkesconpprcpath command

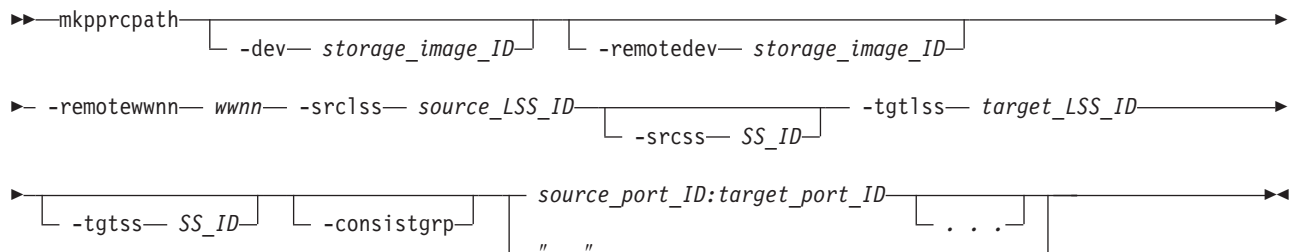
```
dscli>mkesconpprcpath -dev IBM.2105-75FA120 -remotedev IBM.2105-75FA150
-srclss 01 -tgtlss 01 I0100:I20 I0110:I21
```

### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.2105-75FA120
Remote Mirror and Copy path
IBM.2105-75FA120/01:IBM.2105-75FA150/01 successfully created.
```

## mkpprcpath

The **mkpprcpath** command establishes or replaces a remote mirror and copy (formerly PPRC) path between source and target logical subsystems (LSSs) over a fibre-channel connection. This is the only supported connectivity for machine types 2107 and 1750. Paths can be established between the following machine types: 2105:2105, 2107:2107, 2107:1750, 2107:2105, 1750:1750, 1750:2105.



## Parameters

### -dev storage\_image\_ID

(Optional) Specifies the source storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified source port ID.

### -remotedev storage\_image\_ID

(Optional) Specifies the ID of the secondary storage image, which includes manufacturer, machine type, and serial number. If specified, the format of this entry might be checked for correctness although the value is not used

Example: IBM.1750-68FA150

### -remotewwnn wwnn

(Required) Specifies the worldwide node name of the secondary storage image. The format is a 16-hexadecimal ID.

**Note:** Ensure that you use the worldwide node name that is associated with the secondary storage unit. Run the **lssi** or **showsi** command to obtain this number.

Example: 12341234000A000F

**-src~~l~~ss** *source\_LSS\_ID*

(Required) Specifies the source logical subsystem ID. Use a fully qualified LSS ID, which includes the storage image ID, or use a shortened version without the storage image ID, if the **-dev** parameter is used. The fully qualified LSS ID format is *storage\_image\_ID/XX*, where *XX* is a hexadecimal number in the range (1750) 00 - 1F.

Example of a shortened version: 00

**-src~~s~~ss** *SS\_ID*

(Optional) Specifies the subsystem ID of the primary logical subsystem in the format 0x0001 - 0xFFFF.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

**-tgt~~l~~ss** *target\_LSS\_ID*

(Required) Specifies the logical subsystem ID associated with the secondary storage unit as the target. Use a fully qualified LSS ID, which includes the storage image ID. The fully qualified LSS ID format is *storage\_image\_ID/XX*, where *XX* is a hexadecimal number in the range (1750) 00 - 1F.

Example of a shortened version: 01

**-tgt~~s~~ss** *SS\_ID*

(Optional) Specifies the subsystem ID of the secondary logical subsystem in the format 0x0001 - 0xFFFF.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

**-consistgrp**

(Optional) Creates a consistency group for the remote mirror and copy volume pairs. A remote mirror and copy consistency group is a set of remote mirror and copy volume pairs that have the same source and target LSS.

Normally, when an error occurs in a member of a remote mirror and copy volume pair, the storage unit places the volume in a *suspended* state. However, if the volume participates in a consistency group, it is placed in a *long busy* state.

*source\_port\_ID:target\_port\_ID . . . | -*

(Required) Establishes a remote mirror and copy path between the source and target ports for the specified source and target logical subsystems. The source and target ports must be fibre-channel I/O ports that are configured for point-to-point or switched fabric topology. They are enabled automatically for remote mirror and copy secondary I/O operations. They are not enabled for FICON I/O operations.

Use fully qualified port IDs, which includes the storage image ID, or use a shortened version without the storage image ID if the **-dev** parameter is specified. A remote mirror and copy path port pair ID consists of two port IDs. Designate the first as the source port and the second as the target port for the



remote mirror and copy path. You must separate the two port IDs with a colon and no spaces. A port ID is four hexadecimal characters in the format *EEAP*, where *EE* is a port enclosure number (00 - 3F), *A* is the adapter number (0 - F), and *P* is the port number (0 - F). This number is prefixed with the letter *I*.

This parameter accepts up to eight remote mirror and copy path port pair IDs. You must separate multiple port pair IDs with spaces.

If you use the dash (-), the specified value is read from standard input.

Example of the shortened version: I1A10:I2A20

Example of multiple pairs: I1A10:I2A20 I1A11:I2A21 I1A12:I2A22

## Example (1750)

### Invoking the mkpprcpath command

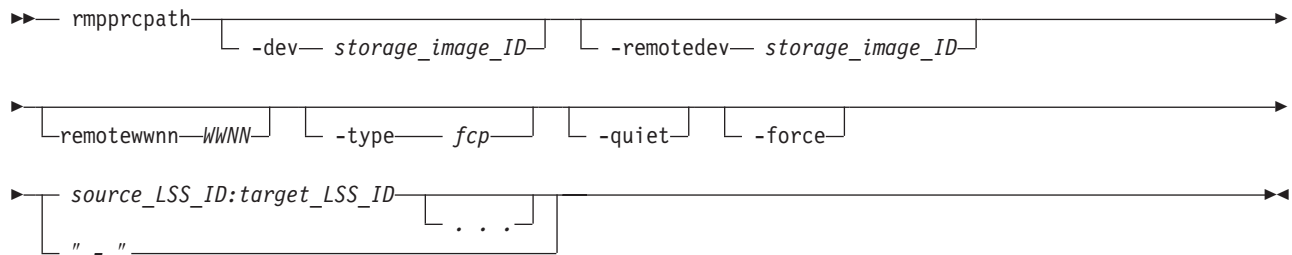
```
dscli>mkpprcpath -dev IBM.1750-68FA120
-srcLSS 01 -tgtLSS 01 -remotewwnn 12341234000A000F I0100:I0100
```

### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
Remote Mirror and Copy path 01:01 successfully established.
```

## rmpprcpath

The rmpprcpath deletes a Remote Mirror and Copy path.



## Parameters

### -dev storage\_image\_ID

(Optional) Specifies the source storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified source LSS ID or you do not specify a value for the *devId* variable in your profile file.

Example: IBM.1750-68FA120

### -remotedev storage\_image\_ID

(Optional) Specifies the target storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified target LSS ID or if the **-dev** parameter is used.

### -remoteWWNN WWNN

(Optional) Specifies the secondary worldwide node name.

**Note:** The following considerations can help you decide whether to use this parameter:

- If you do not specify this parameter, DS CLI processing requires a query for this information from the remote device. In some cases, due

to the path-specific state, the query might fail to locate the remote WWNN. If the remote WWNN cannot be located, the **rmpprcpath** command fails. Process the **lspprcpath** command to obtain the remote WWNN information and then process the **rmpprcpath** command with the remote WWNN information included.

- Use the **lspprcpath** command to obtain the remote WWNN information.

**-type *fc***

(Optional) The type of the connection over which the path was created.

**fc**      Fibre-channel protocol

**-quiet**

(Optional) Turns off the confirmation prompt for this command.

**-force**

(Optional) Specifies that you want to remove Remote Mirror and Copy paths even if Remote Mirror and Copy volume pairs exist. Otherwise, specified paths that are associated with existing Remote Mirror and Copy volume pairs are not be removed.

*source\_LSS\_ID:target\_LSS\_ID . . . | -*

(Required) Specifies the Remote Mirror and Copy path relationships for the source and target LSSs that are to be removed. The LSS pair ID consists of two LSS IDs, one designated as the source LSS and the other as the target LSS for a Remote Mirror and Copy path relationship. The two LSS IDs must be separated with a colon and no spaces. The first LSS ID is the source LSS. The second LSS ID is the target LSS.

This parameter accepts fully qualified LSS IDs, which includes the storage image ID, or a shortened version without the storage image ID if the **-dev** parameter is specified.

The fully qualified LSS ID format is *storage\_image\_ID/xx*, where *xx* is a hexadecimal number in the range (1750) 00 - 1F.

If you use the dash (-), the specified value is read from standard input.

Example of a fully qualified pair: IBM.1750-68FA120/00:IBM.1750-68FA150/00

Example of a shortened version: 00:00

Example of multiple pairs: 00:00 01:01 02:02

## Example (1750)

### Invoking the **rmpprcpath** command

```
dscli>rmpprcpath -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150
-remotewwnn 12341234000A000F 01:01
```

### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

```
Are you sure want to remove the Remote Mirror and Copy path 01:01? [y/n]:Y
Remote Mirror and Copy path 01:01 successfully removed.
```

## Remote Mirror and Copy pair commands

This section contains commands that create, manage, and delete Remote Mirror and Copy (formerly PPRC) pairs and display Remote Mirror and Copy pair information.

Use the following commands to create, manage, and delete Remote Mirror and Copy pairs and to display Remote Mirror and Copy pair information:

- **failbackpprc**
- **failoverpprc**
- **lspprc**
- **mkpprc**
- **freezepprc**
- **pausepprc**
- **resumepprc**
- **rmpprc**
- **unfreezepprc**

The **failbackpprc** command copies the required data from the source volume to the target volume in order to resume mirroring. You can use this command after a **failoverpprc** command has been issued to restart mirroring from site A (local site) to site B (remote site).

The **failoverpprc** command generates Global Mirror and Metro Mirror disaster recovery processes with the following results:

- In a Global Mirror failover recovery process, the **failoverpprc** command initiates failover processing of B volumes to A volumes.
- In a Global Mirror failback recovery process (production is returned to the local site), the **failoverpprc** command initiates failover processing from A volumes to B volumes.
- In a Metro Mirror disaster recovery process, failover processing to the Global Copy secondary volume causes the secondary volumes to become primary volumes and immediately suspends these volumes. The **failoverpprc** command changes a secondary device into a primary suspended device while leaving the primary device in its current state.

The **lspprc** command generates a report that displays a list of remote mirror and copy volume relationships for a storage image and the status information for each remote mirror and copy volume relationship in the list.

The **mkpprc** command establishes a remote mirror and copy relationship for a volume pair.

The **freezepprc** command creates a new remote mirror and copy consistency group. It places the source logical subsystem (LSS) in the long busy state so that no I/O can be directed to it. It also removes remote mirror and copy paths between the source LSS and target LSS and sets the queue-full condition for the primary volume.

The **pausepprc** command pauses an existing remote mirror and copy volume pair relationship or pauses a single volume ID.

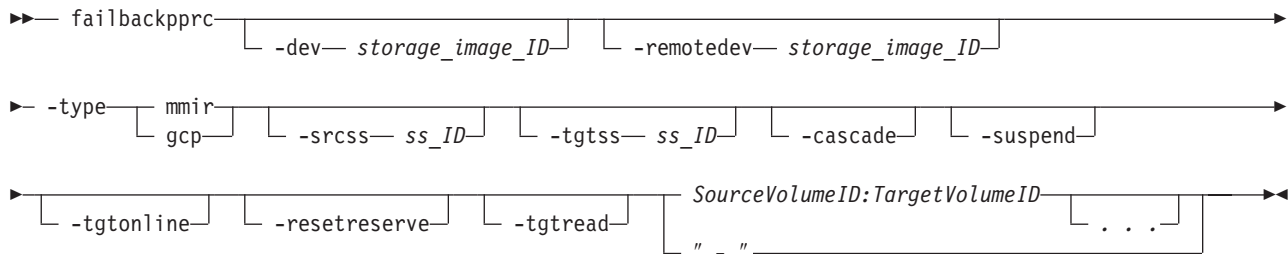
The **resumepprc** command resumes a remote mirror and copy relationship for a volume pair.

The **rmpprc** command removes one or more specified remote mirror and copy volume pair relationships, or it removes a single volume ID (which might be useful when a disaster occurs and you want to specify only the available volume and not both the primary and secondary volumes).

The **unfreezepprc** command resumes I/O activity on a storage unit where the **freezepprc** command has been issued. The **unfreezepprc** command resets the queue full condition for the primary volume.

## failbackpprc

The **failbackpprc** command copies the required data from the source volume to the target volume in order to resume mirroring. This command is used in the disaster recovery processes that are associated with sites using Metro Mirror, Global Mirror, or Metro/Global Mirror processing.



## Parameters

### Notes:

1. You can issue the **failbackpprc** command against any remote mirror and copy volume that is in a primary suspended state. The failback processing copies the required data from the source volume to the target volume in order to resume mirroring.
2. A metro mirror (synchronous) pair must be suspended before it can be reestablished as a Global Copy (extended distance) pair and vice versa.
3. When you specify subsystem IDs (SSIDs), the source and target volumes are restricted to 1 LSS for the source and 1 LSS for the target.

### -dev storage\_image\_ID

(Optional). Specifies the source storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified source volume ID, which includes the storage image ID, for the source volume IDs that are defined by the **Source\_Volume\_ID:Target\_Volume\_ID** parameter.

**Note:** The use of the **failbackpprc** command requires that this parameter reflect a role reversal. The value for this parameter must be the **original primary** site which has been repaired and is ready to once again become your primary production site. For example:

- Original primary site (Site A) has a value of IBM.1750-68FA120 with volumes 0100, 0101, 0102, 0103.
- Original secondary site (Site B) has a value of IBM.1750-68FA150 with volumes 0200, 0201, 0202, 0203.

- The following **failbackpprc** command is correct:

```
dscli>failbackpprc -dev IBM.1750-685FA120
-remotedev IBM.1750-68FA150
0100:0200 0101:0201 0102:0202 0103:0203
```

**-remotedev** *storage\_image\_ID*

(Optional). Specifies the target storage image ID, which includes manufacturer, type, and serial number. The **-remotedev** parameter identifies the remote storage unit that contains the target volume IDs that are defined by the **SourceVolumeID:TargetVolumeID** parameter. The **-remotedev** parameter is required if you do not specify a fully qualified target volume ID or if you use the **-dev** parameter.

**Note:** The use of the **failbackpprc** command requires that this parameter reflect a role reversal. The value for this parameter must be the **original secondary** site. For example:

- Original primary site (Site A) has a value of IBM.1750-68FA120 with volumes 0100, 0101, 0102, 0103.
- Original secondary site (Site B) has a value of IBM.1750-68FA150 with volumes 0200, 0201, 0202, 0203.
- The following **failbackpprc** command is correct:

```
dscli>failbackpprc -dev IBM.1750-685FA120
-remotedev IBM.1750-68FA150
0100:0200 0101:0201 0102:0202 0103:0203
```

**-type** *mmir* | *gcp*

(Required). Modify one or more existing remote mirror and copy volume relationships as either Metro Mirror (Synchronous) or Global Copy (Extended Distance) relationships.

**mmir** Metro Mirror maintains the remote mirror and copy relationship in a consistent manner by returning the I/O write completion status to the application when the updates are committed to the target. This process becomes slower as the physical distance between source and target increases.

**gcp** Global Copy maintains the remote mirror and copy relationship in a nonsynchronous manner. I/O write completion status is returned to the application when the updates are committed to the source. Updates to the target volume are performed at a later time. The original order of updates is not strictly maintained.

**-cascade**

(Optional) Specifies that the remote mirror and copy target volume can also be a remote mirror and copy source volume of a different remote mirror and copy volume relationship.

**-suspend**

(Optional) Specifies that the remote mirror and copy relationship be suspended when the task completes.

**Notes:**

1. This parameter is not valid for a Global Copy (Extended Distance) remote mirror and copy volume relationship.

2. This parameter is not valid for a Metro Mirror (Synchronous) remote mirror and copy volume relationship that is established with the No Copy option activated.

**-tgtonline**

(Optional) Specifies that a remote mirror and copy volume relationship be established, including when the target volume is online to host systems.

**Note:** This parameter applies only to S/390 or zSeries volumes. It does not apply to Open Systems volumes.

**-resetreserve**

(Optional) Specifies that a remote mirror and copy relationship be established when the volume on the secondary logical subsystem is reserved by another host. If this parameter is not specified and the volume on the secondary logical subsystem is reserved, the command fails.

**Note:** This parameter applies only to fixed block volumes.

**-tgtread**

(Optional) Specifies that host servers be allowed to read from the remote mirror and copy target volume. For a host server to read the volume, the remote mirror and copy pair must be in a full-duplex state.

**Note:** This parameter applies only to Open System volumes.

**-srcss *ss\_ID***

(Optional). Specifies the subsystem ID of the primary logical subsystem in the format 0x0001 - 0xFFFF.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

**Note:** The source and target volumes are restricted to one LSS for the source and one LSS for the target when you specify *ss\_ID*s.

Example: 0010

**-tgtss *ss\_ID***

(Optional). Specifies the subsystem ID of the secondary logical subsystem in the format 0x0001 - 0xFFFF.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

**Note:** The source and target volumes are restricted to one LSS for the source and one LSS for the target when you specify *ss\_ID*s.

Example: 0010

***SourceVolumeID:TargetVolumeID . . . | -***

(Required). Specifies the remote mirror and copy volume pair IDs for the source and target volume pairs that are to undergo failback processing. The original values (before the disaster) return with the source volume IDs equal to the A volumes and the target volume IDs equal to the B volumes.

This parameter accepts fully qualified volume IDs, which includes storage image IDs or a shortened version without storage image IDs if the **-dev** parameter is specified. You must separate multiple remote mirror and copy pair IDs with spaces.

A remote mirror and copy volume pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a remote mirror and copy relationship. You must separate the two volume IDs of a remote mirror and copy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The volume ID is a 32 bit number that can be represented as 4 hexadecimal digits in the form of *XYZZ* where *X* is the address group (0 - 1), *XY* together is the logical subsystem number 00 - 1E (for 1750) , and *ZZ* is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input.

Example of a fully qualified pair: IBM.1750-68FA120/0100:IBM.1750-68FA150/0100

Example of multiple pairs: 0101:0101 0102:0102 0103:0103

### Example (1750)

#### Invoking the failbackpprc command

```
dscli>failbackpprc -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150
0100:0100 0101:0101 0102:0102 0103:0103
```

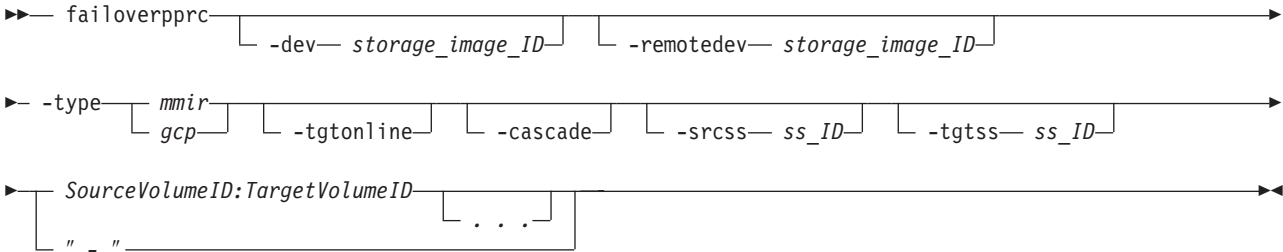
#### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120

Remote Mirror and Copy pair IBM.1750-68FA120/0100:IBM.1750-68FA150/0100
successfully failed back.
Remote Mirror and Copy pair IBM.1750-68FA120/0101:IBM.1750-68FA150/0101
successfully failed back.
Remote Mirror and Copy pair IBM.1750-68FA120/0102:IBM.1750-68FA150/0102
successfully failed back.
Remote Mirror and Copy pair IBM.1750-68FA120/0103:IBM.1750-68FA150/0103
successfully failed back.
```

### failoverpprc

The **failoverpprc** command is used only with disaster recovery processing. This command is used in the disaster recovery processes associated with sites using Metro Mirror, Global Mirror, or Metro/Global Mirror processing. The **failoverpprc** command succeeds even if the paths are down and the volume at the production site is unavailable or nonexistent.



### Parameters

The **failoverpprc** command is used in the Global Mirror and Metro Mirror disaster recovery processes with the following results:



- In a Global Mirror failover recovery process, the **failoverpprc** command initiates failover processing of B volumes to A volumes. This causes the B volumes to become the primary volumes and the A volumes to become the secondary volumes. The effect is that the Global Copy state of the B volumes changes from secondary to primary and suspended.
- In a Global Mirror failback recovery process (production is returned to the local site), the **failoverpprc** command initiates failover processing from A volumes to B volumes. This causes the A volumes to become the primary volumes and the B volumes to become the secondary volumes.
- In a Metro Mirror disaster recovery process, failover processing to the Global Copy secondary volume causes the secondary volumes to become primary volumes and immediately suspends these volumes. When you run a Global Copy failover, the B volumes are the primary volumes and the A volumes are the secondary volumes. This action changes only the Global Copy state of the secondary volumes from Target Copy Pending to Suspended. The **failoverpprc** command changes a secondary device into a primary suspended device while leaving the primary device in its current state. This command succeeds even if the paths are down and the volume at the production site is unavailable or nonexistent.

**Note:** When you specify the subsystem identifier (SSID), the source and target volumes are restricted to one LSS for the source and one LSS for the target.

**-dev** *storage\_image\_ID*

(Optional). Specifies the source storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified source volume ID.

**Note:** The use of the **failoverpprc** command requires that this parameter reflect a role reversal. The value for this parameter must be the **original secondary** site. For example:

- Original primary site (Site A) has a value of IBM.1750-68FA120 with volumes 0100, 0101, 0102, 0103.
- Original secondary site (Site B) has a value of IBM.1750-68FA150 with volumes 0200, 0201, 0202, 0203.
- The following **failoverpprc** command is correct:

```
dscli>failoverpprc -dev IBM.1750-685FA150
-remotedev IBM.1750-68FA120
0200:0100 0201:0101 0202:0102 0203:0103
```

**-remotedev** *storage\_image\_ID*

(Optional). Specifies the target storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified target volume ID or if you use the **-dev** parameter.

**Note:** The use of the **failoverpprc** command requires that this parameter reflect a role reversal. The value for this parameter must be the **original primary** site. For example:

- Original primary site (Site A) has a value of IBM.1750-68FA120 with volumes 0100, 0101, 0102, 0103.
- Original secondary site (Site B) has a value of IBM.1750-68FA150 with volumes 0200, 0201, 0202, 0203.
- The following **failoverpprc** command is correct:



```
dscli>failoverpprc -dev IBM.1750-685FA150
-remotedev IBM.1750-68FA120
0200:0100 0201:0101 0202:0102
```

**-type** *mmir* | *gcp*

(Required). Modifies one or more existing remote mirror and copy volume relationships as either Metro Mirror or Global Copy relationships.

**mmir** Metro Mirror maintains the remote mirror and copy relationship in a consistent synchronous manner when the updates are committed to the target. This process becomes slower as the physical distance between source and target increases.

**gcp** Global Copy maintains the remote mirror and copy relationship in a nonsynchronous manner when the updates are committed to the source. Updates to the target volume are performed at a later time. The original order of updates is not strictly maintained.

**-tgtonline**

(Optional). Establishes a remote mirror and copy volume relationship, including when the target volume is online to host systems.

This parameter applies to S/390 or zSeries volumes. It does not apply to Open Systems volumes.

**-cascade**

(Optional). Specifies that the PPRC target volume can also be a PPRC source volume of a different PPRC volume relationship.

**-srcss** *ss\_ID*

(Optional). Specifies the subsystem ID of the primary logical subsystem in the format 0x0001 - 0xFFFF.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

**-tgtss** *ss\_ID*

(Optional). Specifies the subsystem ID of the secondary logical subsystem in the format 0x0001 - 0xFFFF.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

**SourceVolumeID:TargetVolumeID . . . | -**

(Required) Specifies the remote mirror and copy volume pair IDs of the source and target volumes that must have their relationships changed so that the target volumes (B volumes) become the source volumes and the original source volumes (A volumes) become the target volumes. This results in the following conditions:

- The source volumes (B volumes) show as a suspended host.
- The target volumes (A volumes) show as a suspended target and they are accessible for mounting.

This parameter also accepts fully qualified volume IDs, which includes storage image IDs or a shortened version without storage image IDs, if the **-dev** parameter is specified. You must separate multiple remote mirror and copy pair IDs with spaces.

A remote mirror and copy pair ID consists of two volume IDs: one designated as the source and the other as the target volume for a remote mirror and copy relationship. You must separate the two volume IDs of a remote mirror and copy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The volume ID is a 32 bit number that can be represented as 4 hexadecimal digits in the form of *XYZZ* where *X* is the address group (0 - 1), *XY* together is the logical subsystem number 00 - 1E, and *ZZ* is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input.

Example of a fully qualified pair: IBM.1750-68FA150/0100:IBM.1750-68FA120/0100

Example of a shortened version: 0100:0100

Example of multiple pairs: 0101:0101 0102:0102 0103:0103

### Example (1750)

#### Invoking the failoverpprc command

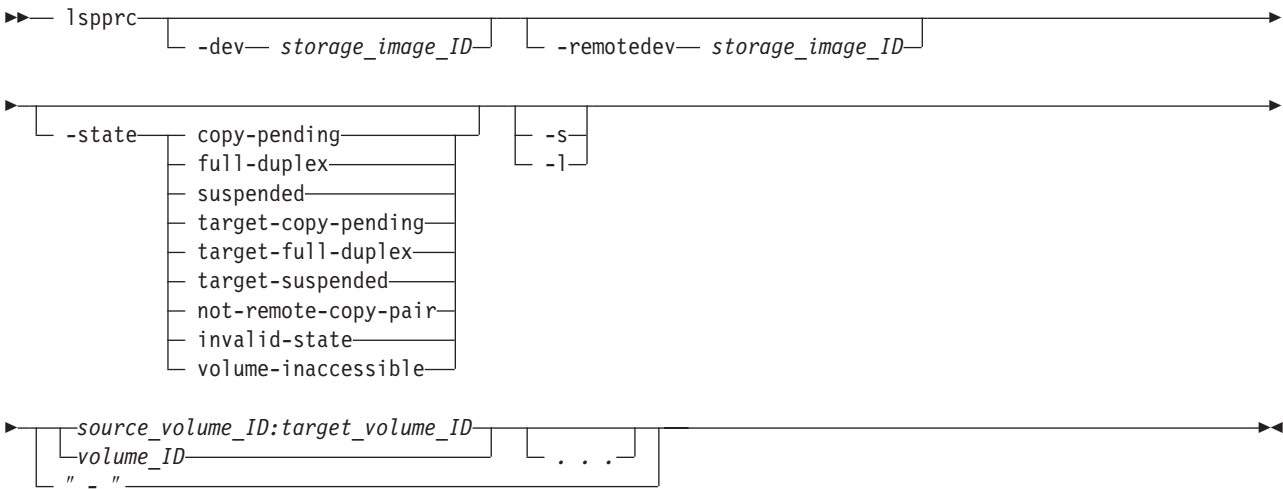
```
dscli>failoverpprc -dev IBM.1750-68FA150 -remotedev IBM.1750-68FA120
0200:0100 0201:0101 0202:0102
```

#### The resulting output

A confirmation message is presented for each remote mirror and copy pair that is successfully suspended.

#### lspprc

The **lspprc** command displays a list of remote mirror and copy (formerly PPRC) volume relationships for a storage image, and status information for each remote mirror and copy volume relationship in the list.



#### Parameters

**-dev *storage\_image\_ID***  
 (Optional). Specifies the storage image ID, which consists of manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source and target volumes.

**-remotedev** *storage\_image\_ID*

(Optional; however, required as noted). Specifies the target volume storage image ID, which consists of manufacturer, machine type, and serial number.

**Note:** The **-remotedev** parameter is required when volume pairs are specified and the **-dev** parameter is specified, as well.

**-state** **copy-pending** | **full-duplex** | **suspended** | **target-copy-pending** | **target-full-duplex** | **target-suspended** | **not-remote-copy-pair** | **invalid-state** | **volume-inaccessible**

(Optional). Identifies the state of the remote mirror and copy relationship that you want to view.

**copy-pending**

Specifies that you want to view remote mirror and copy relationships that have copy processing that is pending. A Global Copy relationship is always copy-pending.

**full-duplex**

Specifies that you want to view remote mirror and copy relationships that are full duplex.

**suspended**

Specifies that you want to view remote mirror and copy relationships that are suspended. The Reason attribute might indicate why the relationship is suspended.

**target-copy-pending**

Specifies that you want to view remote mirror and copy relationships where the target volume has copy processing that is pending. In this state, the source volume is unknown or cannot be queried.

**target-full-duplex**

Specifies that you want to view remote mirror and copy relationships where the target volume is full duplex. In this state, the source volume is unknown or cannot be queried.

**target-suspended**

Specifies that you want to view remote mirror and copy relationships where the target volume is suspended. In this state, the source volume is unknown or cannot be queried. The Reason attribute might indicate why the relationship is suspended.

**not-remote-copy-pair**

Specifies that you want to view remote mirror and copy relationships that are not a remote copy pair.

**invalid-state**

Specifies that you want to view remote mirror and copy relationships that do not meet requirements for being valid. The report that is generated with this query only displays the source and target volume IDs of a remote mirror and copy volume relationship and the state designation of **invalid-state**. All the other information columns are displayed with a null (-) value.

**volume-inaccessible**

Specifies that you want to view remote mirror and copy relationships where the volume cannot be viewed, generally this means that the volume is fenced. The report that is generated with this query only displays the source and target volume IDs of a remote mirror and copy

volume relationship and the state designation of **volume-inaccessible**.  
All the other information columns are displayed with a null (-) value.

- s** (Optional). Displays the remote mirror and copy volume pair IDs. You cannot use the **-s** and the **-l** parameters together.
- l** (Optional). Displays the default output plus additional attributes that are identified as long output. You cannot use the **-l** and the **-s** parameters together.

*SourceVolumeID:TargetVolumeID | Volume\_ID . . . | -*

(Required) Displays the remote mirror and copy relationships for the source and target volume pairs with the specified IDs.

This parameter accepts fully qualified volume IDs, which includes storage image IDs or a shortened version without storage image IDs, if the **-dev** parameter is specified. You must separate multiple remote mirror and copy pair IDs with spaces.

A remote mirror and copy pair ID consists of two volume IDs: one designated as the source and the other as the target volume for a remote mirror and copy relationship. You must separate the two volume IDs of a remote mirror and copy pair ID with a colon and no spaces. The first volume ID is the source volume. The second volume ID is the target volume.

You can enter remote mirror and copy pair IDs, a range of remote mirror and copy pair IDs, single volume IDs, or a range of volume IDs. You cannot enter a combination of remote mirror and copy IDs and volume IDs.

The volume ID is a 32 bit number that can be represented as 4 hexadecimal digits in the form of XYZZ, where X is the address group (0 - 1), XY together is the logical subsystem number 00 - 1E (for DS6000) , and ZZ is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input. You cannot use the dash (-) while you are in the DS CLI interactive command mode.

Example of a shortened version: 0100:0100

Example of multiple IDs: 0100:0100 0200:0200 0300:0300

**Note:** A query of target volume IDs is directed to the storage image that is identified by the **-dev** parameter or embedded in the fully qualified single volume IDs.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **lspprc** command using the **-l** parameter.

### Invoking the lspprc command

```
dscli>lspprc -dev IBM.2107-75FA120 -remotedev IBM.2107-75FA150 -l 0100:0100
0101:0101
```

### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.2107-75FA120
```

| ID                                                | State       | Reason | Type         | Out<br>Of<br>Sync<br>Tracks | Tgt<br>Read | Src<br>Cascade |
|---------------------------------------------------|-------------|--------|--------------|-----------------------------|-------------|----------------|
| IBM.2107-75FA120 /0100:<br>IBM.2107-75FA150 /0100 | Full-Duplex | -      | Metro Mirror | 0                           | Enabled     | Disabled       |
| IBM.2107-75FA120 /0101:<br>IBM.2107-75FA150 /0101 | Full-Duplex | -      | Metro Mirror | 0                           | Enabled     | Disabled       |

### Report field descriptions

**ID** Specifies the source and target volume IDs of a remote mirror and copy volume relationship.

**State** Displays the current remote mirror and copy volume relationship state. One of the following values is displayed:

#### Copy Pending

Indicates that the relationship is copy pending. A Global Copy (extended distance) relationship is always copy pending.

#### Full Duplex

Indicates that the relationship is full duplex.

#### Suspended

Indicates that the relationship is suspended. The Reason attribute might indicate why the relationship is suspended.

#### Target Copy Pending

Indicates that the source volume is unknown or cannot be queried and the target state is copy pending.

#### Target Full Duplex

Indicates that the source volume is unknown or cannot be queried and the target state is full duplex.

#### Target Suspended

Indicates that the source volume is unknown or cannot be queried and the target state is suspended.

#### Not Part of Remote Copy Pair

Indicates that the relationship is not a remote copy pair.

#### Invalid State

Indicates that the listed remote mirror and copy volume relationships do not meet the requirements for being valid.

**Note:** The report that is generated with the *invalid-state* designation only displays the source and target volume IDs of a remote mirror and copy volume relationship and the state designation of Invalid State. All the other information columns are displayed with a null (-) value.

### **Validation Required**

Indicates that the status of the volume can not be determined at this time. Further validation is required. Sometimes, to re-run the same lsprrc command later will have different state output.

**Note:** The report that is generated with the *validation-required* designation only displays the source and target volume IDs of a remote mirror and copy volume relationship and the state designation of validation-required. All the other information columns are displayed with a null (-) value.

### **Volume Inaccessible**

Indicates that the volume could not be queried. Generally, this indicates that the volume is fenced.

**Note:** The report that is generated with the *Volume Inaccessible* designation only displays the source and target volume IDs of a remote mirror and copy volume relationship and the state designation of *Volume Inaccessible*. All the other information columns are displayed with a null (-) value.

### **Reason**

Indicates why the remote mirror and copy volume relationship is suspended. The following values can be displayed:

- Specifies that the volume is suspended but the reason for the suspension is not specifically defined within the system

### **Not in PPRC Relationship**

Specifies that the designated volume is not part of a remote mirror and copy pair.

### **Host Source**

Specifies that the remote mirror and copy processing on the volume was suspended by the primary host. The host command might have specified an immediate suspension or that the volume be suspended when it entered a full duplex state.

### **Host Target**

Specifies that remote mirror and copy processing was suspended on the secondary volume. Updates to primary volumes and out-of-sync tracks are still being processed.

### **Update Target**

Specifies that remote mirror and copy processing was suspended on a secondary volume by the primary control unit update secondary device status command.

### **Internal Conditions Both**

Specifies that remote mirror and copy processing was suspended on a volume by either the primary control unit or the secondary control unit because of internal conditions.

### **Simplex Target**

Specifies that remote mirror and copy processing was suspended on a volume when the secondary control unit sent a state change interrupt to the primary control unit indicating a transition to a simplex state.

### **Internal Conditions Target**

Specifies that remote mirror and copy processing was suspended

on a secondary volume when the primary control unit was notified that the secondary volume became suspended due to internal conditions.

**Power** Specifies that remote mirror and copy processing was suspended on a volume when the primary or secondary control unit was shut down or restarted.

**Notes:**

1. The paths to the secondary controller might not be available if the power to the primary controller was shut down. If only the secondary control unit was shut down, it might be possible for the paths to be restored depending on the path status. Use the following process to determine whether your remote mirror and copy processing can be restored on the affected volumes:
  - a. Issue the **lspprc** command and use the generated report to determine the path status.
  - b. Issue the **mkpprc** command if the paths are still intact. This process resynchronizes the volume pairs.
  - c. Continue with your processing.
2. If the above process cannot be performed, you must remove the pair relationships on the affected volumes and start your remote mirror and copy processing from the beginning on the affected volumes.

**Freeze** Specifies that remote mirror and copy processing was suspended on a volume pair because the host issued a Freeze PPRC Group order.

**Volume Not Configured**

Specifies that remote mirror and copy processing was suspended on a volume because the volume is not part of a copy pair relationship.

**Type** Indicates that the remote copy and mirror volume relationship is a Metro Mirror (synchronous) relationship, a Global Copy (extended distance) relationship, or the relationship type is unknown.

**OutOfSync Tracks**

Indicates the number of tracks that are not synchronized for this FlashCopy relationship. The maximum value is dependent on the source volume size.

**Notes:**

1. If you issue the **lspprc** command to view the out-of-sync value for a volume pair (for example, 0000:0001) on a 2105, there is no observable decrease in the value from when you issue the query to the end of the process.
2. If you issue the **lspprc** command to view the out-of-sync value for a single volume (for example, 0000) on a 2105, there is an observable decrease in the value but only at 10 second intervals. If you issue the **lspprc** command and reissue it again before the 10 seconds has expired, there is no observable change in the value.

3. If you issue the **lspprc** command to view the out-of-sync value for a volume pair or a single volume on a 1750, there is an observable decrease in the value but only at 10 second intervals.

**TgtRead**

Indicates that Read I/O operations to the target volume are allowed.

**SrcCascade**

Indicates that the source volume of this relationship is enabled to also be a target volume of a different relationship.

**TgtCascade**

Indicates that the target volume of this relationship is enabled so that it is also a source volume for a different relationship.

**DateSuspended**

Indicates the date when this relationship was last suspended. The value can be displayed as a null (-).

**SourceLSS**

Indicates the consistency group LSS ID that is associated with the source volume of this PPRC volume relationship.

**Timeout (secs)**

Indicates the consistency group Long Busy Timeout setting for the LSS ID that is associated with the source volume of this PPRC volume relationship. The timeout value is either the default value of 120 seconds, or a user-specified value of 1-600 000 seconds.

**CriticalMode**

Indicates whether the remote copy and mirror primary volume represents a critical volume.

**FirstPass Status**

Indicates the first pass Global Copy state of the source volume. The data is valid only when you query the primary box and the queried pair is a Global Copy pair.

**GMIR CG**

Indicates if the remote mirror and copy consistency group is enabled, disabled or not available.

**Notes:**

1. This value is displayed when you designate the use of the **-l** parameter and when the primary volume is being queried.
2. This value is not reported for model 2105. If a model 2105 is being queried, the value displayed for this field is N/A (not available).

**PPRC CG**

Indicates if the volume is in consistent asynchronous remote mirror and copy mode or is not available. The values that can be displayed are enabled, disabled, or not available.

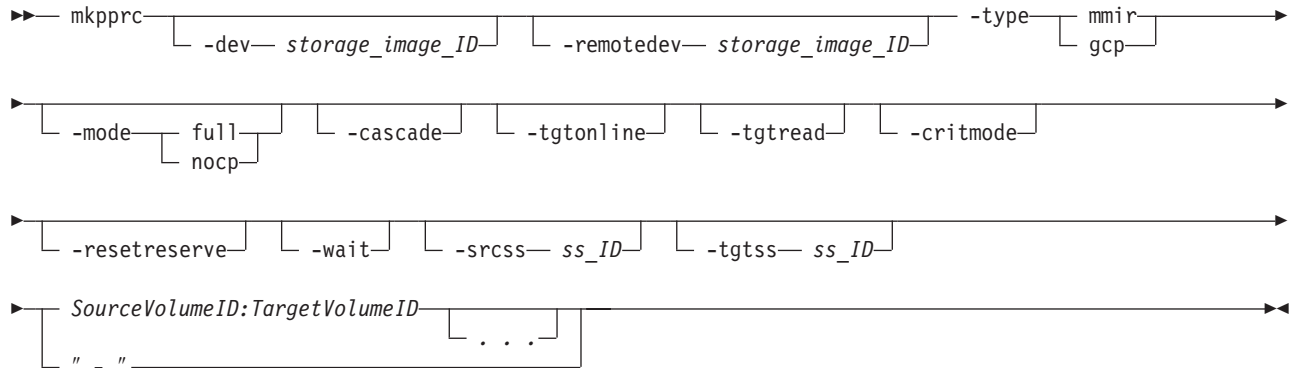
**Notes:**

1. This value is displayed when you designate the use of the **-l** parameter.
2. This value is not reported for model 2105. If a model 2105 is using being queried, the value displayed for this field is N/A (not available).



## mkpprc

The **mkpprc** command establishes a remote mirror and copy (formerly PPRC) relationship for a volume pair.



## Parameters

### Notes:

1. When you specify subsystem IDs, the source and target volumes are restricted to one LSS for the source and one LSS for the target.
2. If you are using the Cisco MDS 9216 Multilayer Fabric Switch, you must not enable the write acceleration feature. The **mkpprc** command might fail if the write acceleration feature is enabled.

### **-dev** *storage\_image\_ID*

(Optional). Specifies the source storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified source volume ID.

Example: IBM.1750-75FA120

### **-remotedev** *storage\_image\_ID*

(Optional). Specifies the target storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified target volume ID, or if the **-dev** parameter is selected.

Example: IBM.1750-68FA120

### **-type** **mmir** | **gcp**

(Required). Establishes one or more remote mirror and copy volume relationships as either Metro Mirror (synchronous) or Global Copy (extended distance) relationships.

**mmir** Metro Mirror maintains the remote mirror and copy relationship in a consistent (synchronous) manner by returning I/O write completion status to the application when the updates are committed to the target. This process becomes slower as the physical distance between source and target increases.

**gcp** Global Copy maintains the remote mirror and copy relationship in a nonsynchronous manner. I/O write completion status is returned to the application when the updates are committed to the source. Updates to the target volume are performed at a later time. The original order of updates is not strictly maintained.

**-mode full | nocp**

(Optional). Specifies the following initial data copy mode for the remote mirror and copy volume relationships:

**full** Full mode copies the entire source volume to the target volume. This is the default when you do not specify the no copy mode.

**nocp** No Copy mode does not copy data from source to target volumes. This option presumes that the volumes are already synchronized.

**-cascade**

(Optional). Enables a remote mirror and copy target volume to be a remote mirror and copy source volume for a different remote mirror and copy volume relationship. The default value for this parameter is disabled.

**-tgtonline**

(Optional). Establishes a remote mirror and copy volume relationship, including when the target volume is online to host systems. This parameter applies to S/390 or zSeries volumes and does not apply to Open Systems volumes. The default value for this parameter is disabled.

**-tgtread**

(Optional). Allows host servers to read from the remote mirror and copy target volume. For a host server to read the volume, the remote mirror and copy pair must be in a full-duplex state. This parameter applies to open systems volumes and does not apply to IBM S/390 or zSeries volumes. The default value for this parameter is disabled.

**-critmode**

(Optional). Protects the source volume from receiving new data. If the last path fails between the pairs and results in the inability to send information to the target, the source is protected. Current updates and subsequent attempts to update the source fail with a unit check on S/390. The default value for this parameter is disabled.

**Note:** This parameter applies only to S/390 or zSeries volumes.

Critical mode operates in one of three ways depending on the setting of the LCU critical mode and the setting of the **-critmode** parameter in this command. The following table presents an overview of how the critical volume mode works.

| Critical Mode   | LCU, Critical Heavy | Mkpprc critmode | Description                                                                                                                                                                                     |
|-----------------|---------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Normal          | Disabled or Enabled | Disabled        | <ul style="list-style-type: none"><li>• Suspends the primary volume.</li><li>• Allows write operations to the primary volume.</li></ul>                                                         |
| Critical Volume | Disabled            | Enabled         | <ul style="list-style-type: none"><li>• Suspends the primary volume when the last path to the secondary volume has failed.</li><li>• Inhibits write operations to the primary volume.</li></ul> |

| Critical Mode  | LCU, Critical Heavy | Mkpprc critmode | Description                                                                                                                                                                                             |
|----------------|---------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Critical Heavy | Enabled             | Enabled         | <ul style="list-style-type: none"> <li>• Suspends the primary volume when the secondary volume cannot be updated for any reason.</li> <li>• Inhibits write operations to the primary volume.</li> </ul> |

#### Notes:

1. Use the **-critmode** parameter only for log devices, not for devices that the system requires. In extreme cases, the host system might have to be IPLed in order to recover a device that is write inhibited. Whenever possible, use the **freezepprc** command as an alternative to using the **-critmode** parameter.
2. The **-critmode** parameter cannot be used with Global Copy or remote copy and mirror cascading volumes.
3. To reset a volume that is write inhibited because of critical mode, you can issue the **mkpprc**, **pausepprc**, or **rmpprc** command to this volume.
4. Use automation software as part of any solution that includes critical mode. Automation software is not a part of the software that is provided with the storage unit; you must supply it. However, IBM has offerings to assist with this automation. For more information, contact your IBM storage representative.

#### **-suspend**

(Optional). Suspends the remote mirror and copy relationship when the task completes. This parameter is not valid for a Global Copy (extended distance) remote mirror and copy volume relationship. This parameter is not valid for a Metro Mirror (synchronous) remote mirror and copy volume relationship that is established with the No Copy option. The default value for this parameter is disabled.

#### **-resetreserve**

(Optional - open system volumes only). Allows the establishment of a remote mirror and copy relationship when the volume on the secondary logical subsystem is reserved by another host. This parameter can only be used with open system volumes. If this option is not specified and the volume on the secondary logical subsystem is reserved, the command fails.

#### **-wait**

(Optional). Delays the command response until the remote copy and mirror volumes are in one of the final states: simplex, full duplex, suspended, secondary full duplex, secondary suspended or secondary simplex (until the pair is not in the Copy Pending state). The default value for this parameter is disabled.

#### Notes:

1. This parameter cannot be used with the **-type gcp** or **-mode nocp** parameters.

2. When you use the **-wait** parameter, you must wait until the original command completely processes before you can issue a new command.
3. If you are running in single-shot mode, you can periodically issue the **lspprc** command to check the remote mirror and copy volume pair state, and then continue with new commands when the correct state is reached.

**-srcss ss\_ID**

(Optional). Specifies the subsystem ID of the primary logical subsystem in the format 0x0001 - 0xFFFF.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

**-tgtss ss\_ID**

(Optional). Specifies the subsystem ID of the secondary logical subsystem in the format 0x0001 - 0xFFFF.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

**SourceVolumeID:TargetVolumeID . . . | -**

(Required). Specifies the remote mirror and copy volume relationship for the source and target volume pairs with the specified IDs.

This parameter accepts fully qualified volume IDs, which includes storage image IDs or a shortened version without storage image IDs, if the **-dev** parameter is specified. You must separate multiple remote mirror and copy pair IDs with spaces.

A remote mirror and copy pair ID consists of two volume IDs: one designated as the source and the other as the target volume for a remote mirror and copy relationship. You must separate the two volume IDs of a remote mirror and copy pair IDs with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The volume ID is a 32 bit number that can be represented as 4 hexadecimal digits in the form of XYZZ, where X is the address group (0 - 1), XY together is the logical subsystem number 00 - 1E (for 1750) , and ZZ is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input.

Example of a fully qualified pair: IBM.1750-68FA120/0100:IBM.1750-68FA150/0100

Example of a shortened version: 0100:0100

Example of multiple pairs: 0101:0101 0102:0102 0103:0103

## Additional processing tips

The following examples represent some CLI volume format options that you might want to incorporate in your processing:

### Processing multiple volumes

The following two examples are ways that this environment might be processed, and both are correct. The first method might be fine if you were

managing a few volumes, while the second allows you to process hundreds or thousands of volumes more efficiently.

- `mkpprc -dev IBM.1750-13AB79A -remotedev IBM.1750-13AB76A -type mmir -mode full -tgtread 1000:1205 1001:1206 1002:1207 1003:1208 1004:1209 ..... and so on`
- `mkpprc -dev IBM.1750-13AB79A -remotedev IBM.1750-13AB76A -type mmir -mode full -tgtread 1000-1004:1205-1209`

### Using the grouping method in your command

You can also group the volumes. However, the order of the volumes is critical when you group them, and they must be contiguous. The following shows how to code for grouping:

```
mkpprc -dev IBM.1750-13AB79A -remotedev IBM.1750-13AB76A -type mmir
-mode full -tgtread 1000-1004:1205-1209 1100-1104:1300-1304
```

## Example (1750)

### Invoking the mkpprc command

```
dsccli>mkpprc -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150
0100:0100 -type mmir 0101:0101 0102:0102 0103:0103
```

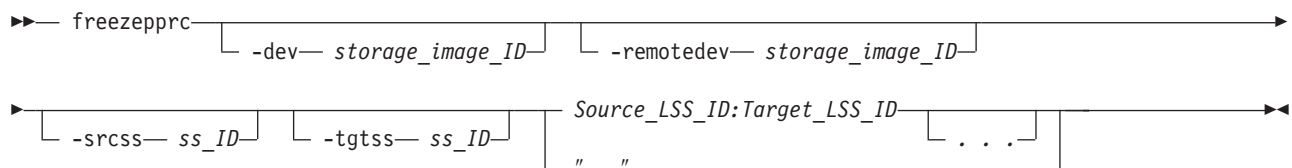
### The resulting output (an example only)

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

```
CMUC00153I mkpprc: Remote Mirror and Copy volume pair relationship
0100:0100 successfully created.
CMUC00153I mkpprc: Remote Mirror and Copy volume pair relationship
0101:0101 successfully created.
CMUC00153I mkpprc: Remote Mirror and Copy volume pair relationship
0102:0102 successfully created
CMUC00153I mkpprc: Remote Mirror and Copy volume pair relationship
0103:0103 successfully created
```

## freezepprc

The **freezepprc** command creates a new remote mirror and copy consistency group. It places the source logical subsystem (LSS) in the *long busy* state so that no I/Os can be directed to it. It also removes remote mirror and copy paths between the source LSS and target LSS and sets the *queue full* condition for the primary volume. This causes the host to queue writes to the primary volume until the *queue full* condition is reset. During the *queue full* condition, the primary volume reports *long busy* status.



## Parameters

**Note:** When specifying SSIDs, the command is limited to one LSS pair.

### -dev storage\_image\_ID

(Optional). Specifies the source storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified source LSS ID.

Example: IBM.1750-68FA120

**-remotedev *storage\_image\_ID***

(Optional). Specifies the target storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified target LSS ID or if the **-dev** parameter is used.

Example: IBM.1750-68FA150

**-srcss *ss\_ID***

(Optional). Specifies the subsystem ID of the primary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

**-tgtss *ss\_ID***

(Optional). Specifies the subsystem ID of the secondary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

***Source\_LSS\_ID:Target\_LSS\_ID . . . | -***

(Required). Specifies that a consistency group for the source and target LSSs with the IDs specified be placed in a long busy state. Accepts fully qualified LSS IDs, which includes the storage image ID, or a shortened version without the storage image ID if the **-dev** parameter is specified.

A remote mirror and copy path LSS pair ID consists of two LSS IDs, one designated as the source LSS and the other as the target LSS for a remote mirror and copy path relationship. The two LSS IDs must be separated with a colon and no spaces. The first LSS ID is the source LSS. The second LSS ID is the target LSS.

The fully qualified LSS ID format is *storage\_image\_ID/xx*, where *xx* is a hexadecimal number in the range 00 - 1F (1750 only).

If you use the dash (-), the specified value is read from standard input.

Example of a pair: 00:00

Example of multiple pairs: 00:00 01:01 02:02

## Example (1750)

### Invoking the freezepprc command

```
dscli>freezepprc -dev IBM.1750-68FA120
-remotedev IBM.1750-68FA150 01:01
```

### The resulting output

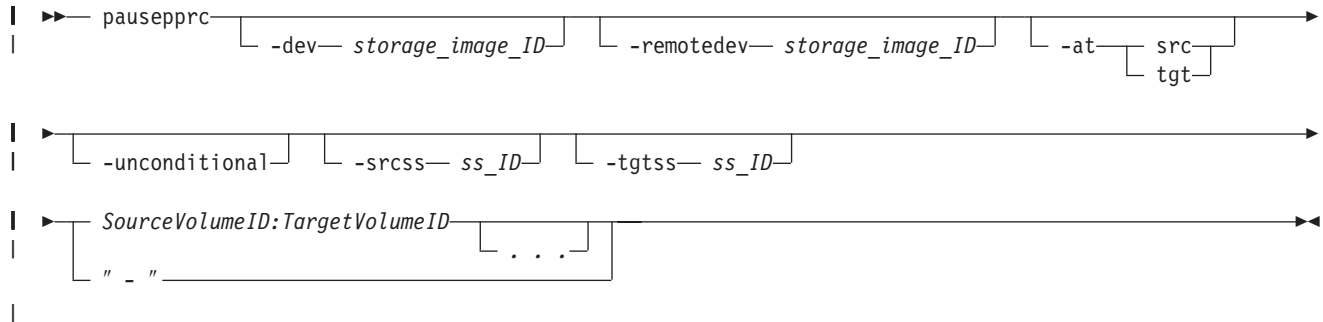
```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

```
Remote Mirror and Copy consistency group 01:01 successfully created.
```

### pausepprc

The **pausepprc** command pauses an existing Remote Mirror and Copy volume pair relationship or pauses a single volume ID. To use this command with a single

volume, you must specify either the **-at src** parameter option or the **-at tgt** parameter option. If neither of these options are specified in the command, single volumes are not valid.



## Parameters

**Note:** When you specify SSIDs, the command is limited to one LSS pair.

### **-dev** *storage\_image\_ID*

(Optional). Specifies the source storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified source volume ID or if you do not specify a value for the *dev* variable in your profile file.

Example of a fully-qualified storage image ID: IBM.2107-75FA120.

**Note:** The only difference between a DS8000 and DS6000 storage image ID is the machine type.

### **-remotedev** *storage\_image\_ID*

(Optional most times). Specifies the target storage image ID, which includes manufacturer, machine type, and serial number.

**Note:** The **-remotedev** parameter is required when volume pairs are specified and the **-dev** parameter is specified, as well.

### **-at src | tgt**

(Optional). Specifies that you want to initiate a suspend action from either the source volume or the target volume.

**src** Initiates a suspend action from the source volume. After the task successfully runs, the source and target volumes are in the **suspend** state.

The **-at src** parameter option can also be used with single volumes. When you specify a single volume using this option, the volume is treated as a source and the target is treated as a null.

**tgt** Initiates a suspend action from the target volume. After the command successfully runs, the target volume is in the **suspend** state, but there is no guarantee that the source volume is suspended as well. For a suspend action that is issued to the target, the source can remain in the **active** state.

The **-at tgt** parameter option can also be used with single volumes. When you specify a single volume using this parameter option, the volume is treated as a target and the source is treated as a null.

**Notes:**

1. If you specify the **-at tgt** or **-at src** parameter and the **-unconditional** parameter, the value for the **-remotedev** parameter is ignored.
2. If you specify the **-at tgt** parameter and do not specify the **-unconditional** parameter, the values for the **-dev** and *SourceVolumeID* parameters are ignored.
3. If you specify the **-at src** parameter and do not specify the **-unconditional** parameter, the values for the **-remotedev** and *TargetVolumeID* parameters are ignored.

**-unconditional**

(Optional). Specifies that a source or target volume has been selected individually, and not as a pair. The **-unconditional** parameter is valid only if the **-at** parameter is selected. Do not use volume pair IDs.

**Notes:**

1. The source volume ID must be specified when you specify the **-at src** parameter.
2. The target volume ID must be specified when you specify the **-at tgt** parameter.

**-srcss** *ss\_ID*

(Optional). Specifies the subsystem ID of the primary logical subsystem in the format 0001 - FFFF.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

**-tgtss** *ss\_ID*

(Optional). Specifies the subsystem ID of the secondary logical subsystem in the format 0001 - FFFF.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

*SourceVolumeID:TargetVolumeID . . . | -*

(Required). Specifies that a Remote Mirror and Copy volume relationship for the source and target volume pairs with the IDs that are specified be paused.

**Note:** Provide a single volume ID instead of a volume pair if you use the **-unconditional** parameter. Specifying pairs results in a format error.

This parameter accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the **-dev** parameter is specified. You must separate multiple remote mirror and copy pair IDs with spaces.

A Remote Mirror and Copy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a Remote Mirror and Copy relationship. You must separate the two volume IDs of a remote mirror and copy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.



The volume ID is a 32-bit number that can be represented as 4 hexadecimal digits in the form of *XYZZ* where *X* is the address group (0 - 1), *XY* together is the logical subsystem number 00 - 1E (for 1750) , and *ZZ* is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input. You cannot use the dash (-) while you are in the DS CLI interactive command mode.

**Note:** Requests directed to target volumes are sent to the Storage Image identified by the **-dev** parameter or is embedded in the fully qualified single volume IDs.

Example of a fully qualified pair: IBM.1750-68FA120/0100:IBM.1750-68FA150/0100

Example of a shortened version: 0100:0100

Example of multiple pairs: 0101:0101 0102:0102 0103:0103

**Example (1750)**

**Invoking the pausepprc command**

```
dscli>pausepprc -dev IBM.1750-68FA120
-remotedev IBM.1750-68FA150 0100:0100
```

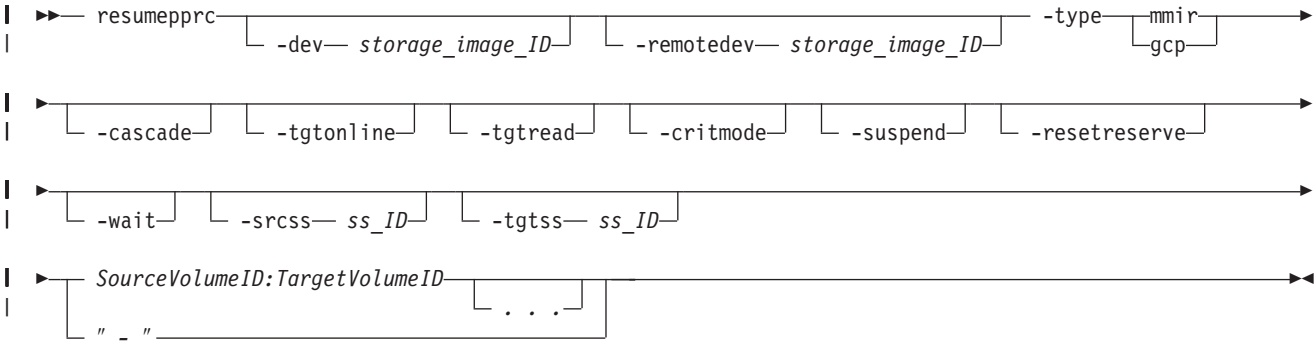
**The resulting output**

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

```
Remote Mirror and Copy pair IBM.1750-68FA120/0100:0103
successfully paused.
```

**resumepprc**

The **resumepprc** command resumes a remote mirror and copy (formerly PPRC) relationship for a volume pair.



**Parameters**

**Notes:**

- 1. When you specify subsystem IDs, the source and target volumes are restricted to one LSS for the source and one LSS for the target.
- 2. When you use the **-wait** parameter, periodically issue the **lspprc** command. This command allows you to verify which of the states that the pair has reached during processing.

3. You cannot issue other commands while the **-wait** parameter is processing. The entire transaction must complete before you can proceed with commands other than status commands like **list** commands or **show** commands.

**-dev** *storage\_image\_ID*

(Optional) Specifies the source storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified source volume ID.

Example: IBM.1750-68FA120

**-remotedev** *storage\_image\_ID*

(Optional) Specifies the target storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified target volume ID or if you specify the **-dev** parameter.

**-type mmir | gcp**

(Required) Modifies one or more remote mirror and copy volume relationships to be either Metro Mirror (synchronous) or Global Copy (extended distance) relationships.

**mmir** Metro Mirror processing maintains the remote mirror and copy relationship in a consistent (synchronous) manner when the updates are committed to the target. This process becomes slower as the physical distance between source and target increases.

**gcp** Global Copy processing maintains the remote mirror and copy relationship in a nonsynchronous manner when the updates are committed to the source. Updates to the target volume are performed at a later point in time. The original order of updates is not strictly maintained.

**-cascade**

(Optional) Enables a remote mirror and copy target volume to be a remote mirror and copy source volume for a different remote mirror and copy volume relationship.

**-tgtonline**

(Optional) Establishes a remote mirror and copy volume relationship, including when the target volume is online to host systems. This parameter applies to S/390 or zSeries volumes. It does not apply to Open Systems volumes.

**-tgtread**

(Optional) Allows host servers to read from the remote mirror and copy target volume. For a host server to read the volume, the remote mirror and copy pair must be in a full-duplex state. This parameter applies to open systems volumes and does not apply to S/390 or zSeries volumes. The default value for this parameter is disabled.

**-critmode**

(Optional) Protects the source volume from receiving new data. If the last path fails between the pairs, which results in the inability to send information to the target, the source is protected. Current updates and subsequent attempts to update the source fail, with a unit check on S/390.

**-suspend**

(Optional) Specifies that the remote mirror and copy relationship be suspended when the task completes. This parameter is not valid for a Global Copy (extended distance) remote mirror and copy volume relationship. This

parameter is not valid for a Metro Mirror (synchronous) remote mirror and copy volume relationship that is established with the No Copy option.

**-resetreserve**

(Optional) Establishes the remote mirror and copy relationship when the volume on the secondary logical subsystem is reserved by another host. If this parameter is not specified and the volume on the secondary logical subsystem is reserved, the command fails.

This parameter can only be used with fixed block volumes.

**-wait**

(Optional). Specifies that the command response be delayed until the remote copy and mirror volumes are in one of the final states: simplex, full duplex, suspended, secondary full duplex, secondary suspended or secondary simplex (until the pair is not in the Copy Pending state). This parameter cannot be used with the **-type gcp** or **-mode ncp** parameters.

**-srcss SS\_ID**

(Optional) Specifies the subsystem ID of the primary logical subsystem in the format 0x0001 - 0xFFFF.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

**-tgtss SS\_ID**

(Optional) Specifies the subsystem ID of the secondary logical subsystem in the format 0x0001 - 0xFFFF.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

**SourceVolumeID:TargetVolumeID . . . | -**

(Required) Specifies that a remote mirror and copy volume relationship for the source and target volume pairs with the specified IDs be resumed.

This parameter accepts fully qualified volume IDs, which includes storage image IDs or a shortened version without storage image IDs, if the **-dev** parameter is specified. You must separate multiple remote mirror and copy pair IDs with spaces.

A remote mirror and copy pair ID consists of two volume IDs: one designated as the source and the other as the target volume for a remote mirror and copy relationship. You must separate the two volume IDs of a remote mirror and copy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The volume ID is a 32-bit number that can be represented as 4 hexadecimal digits in the form of XYZZ, where X is the address group (0 - 1), XY together is the logical subsystem number 00 - 1E, and ZZ is the volume number (00 - FF).

If you use the dash (-), the specified value is read from standard input. You cannot use the dash (-) while you are in the DS CLI interactive command mode.

## Example (1750)

### Invoking the resumepprc command

```
dsccli>resumepprc -dev IBM.1750-68FA120
-remotedev IBM.1750-68FA150 0100:0100
```

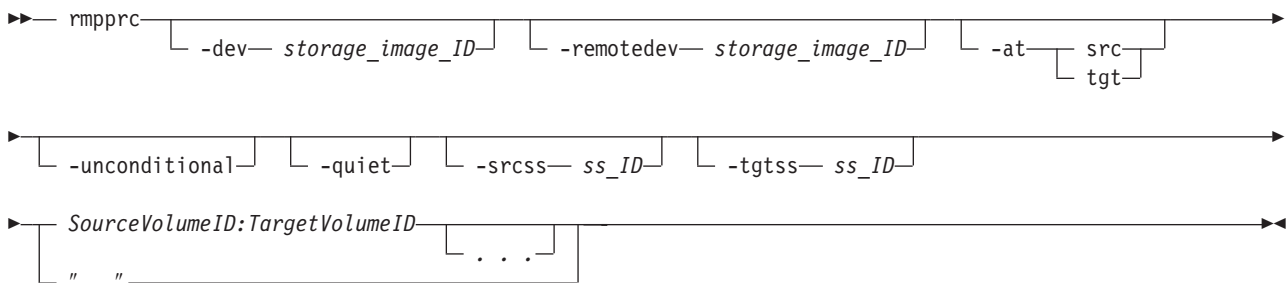
### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

```
Remote Mirror and Copy volume pair IBM.1750-68FA120/0100:0103
relationship successfully resumed. This message is being returned
before the copy completes.
```

### rmpprc

The **rmpprc** command removes a Remote Mirror and Copy volume pair relationship or removes a single volume ID. (You can remove a single volume ID when a disaster occurs, which allows you to specify only the available volume and not both the primary and secondary volumes.) You must specify either the **-at src** parameter option or the **-at tgt** parameter option when you process a single volume. If neither of these options are specified in the **rmpprc** command, a single volume cannot be processed. The **-unconditional** parameter must also be specified when you process a single volume; otherwise, an error occurs and the command process fails.



### Parameters

#### Notes:

1. When you specify subsystem IDs, the source and target volumes are restricted to one LSS for the source and one LSS for the target.
2. If there is a communication problem between the primary server and the secondary server (2-site configuration) when the **rmpprc** command is issued, the following actions occur:
  - Error message CMUN03012E is issued. This error message indicates that there was a communication problem between the primary and secondary server and that the transaction has failed. However, a partial removal of the pair relationship has occurred.
  - The pair relationship is ended on either the primary volumes or the secondary volumes and the volumes that had the relationship removed enter a simplex state.

If this circumstance has occurred, reissue the **rmpprc** command using the **-at src** or the **-at tgt** parameter and the **-unconditional** parameter for each volume that does not have its pair relationship removed.

The following represents the format of the **rmpprc** command when you must remove a partial pair relationship:

- If the source volume has not been removed from the pair relationship, enter the **rmpprc** command at the **dscli** command prompt with the following parameters and variables:

```
dscli>rmpprc -dev storage_image_ID -at src
-unconditional SourceVolumeID
```

- If the target volume has not been removed from the pair relationship, enter the **rmpprc** command at the **dscli** command prompt with the following parameters and variables:

```
dscli>rmpprc -dev storage_image_ID -at tgt
-unconditional TargetVolumeID
```

The value of the storage image ID must be the secondary server.

The management console must be able to communicate with the secondary server for this command to process successfully.

3. If a disaster occurs involving a 3-site configuration, the **rmpprc** command with the **-at tgt** and **-unconditional** parameters are used in the recovery process.

#### **-dev** *storage\_image\_ID*

(Optional). Specifies the source storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified source volume ID or you do not specify a value for the *devid* variable in your profile file.

Example: IBM.1750-68FA120

#### **-remotedev** *storage\_image\_ID*

(Optional most times). Specifies the target storage image ID, which includes manufacturer, machine type, and serial number.

**Note:** The **-remotedev** parameter is required when volume pairs are specified and the **-dev** parameter is specified, as well.

Example: IBM.1750-68FA150

#### **-at src | tgt**

(Optional). Specifies that you want to initiate a break action from either a source volume or a target volume.

**src** Select the **-at src** parameter option to initiate a break action from the source volume. After the task successfully runs, the source and target volumes are in the **simplex** state.

**tgt** Select the **-at tgt** parameter option to initiate a break action from the target volume. After the command successfully runs, the target volume is in the **simplex** state, but there is no guarantee that the source volume state will change. For a break action issued to the target, the source can remain in the **suspend** state.

The **-at tgt** parameter option can also be used with single volumes but you must also specify the **-unconditional** parameter. When you specify a single volume using this parameter, the volume is treated as a target and the source is treated as a null.

#### **Notes:**

1. If you specify the **-at tgt** or **-at src** parameter and the **-unconditional** parameter, the value for the **-remotedev** parameter is ignored.

2. If you specify the **-at tgt** parameter and do not specify the **-unconditional** parameter, the values for the **-dev** and *SourceVolumeID* parameters are ignored.
3. If you specify the **-at src** parameter and do not specify the **-unconditional** parameter, the values for the **-remotedev** and *TargetVolumeID* parameters are ignored.

**-unconditional**

(Optional). Specifies that a source or target volume has been selected individually, and not as a pair. The **-unconditional** parameter is valid only if the **-at** parameter is selected. Do not use volume pair IDs.

**Notes:**

1. The source volume ID must be specified when you specify the **-at src** parameter.
2. The target volume ID must be specified when you specify the **-at tgt** parameter.

**-quiet**

(Optional). Specifies that the confirmation prompt for this command be turned off.

**-srcss *ss\_ID***

(Optional). Specifies the subsystem ID of the primary logical subsystem in the format 0001 - FFFF.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

**-tgtss *ss\_ID***

(Optional). Specifies the subsystem ID of the secondary logical subsystem in the format 0001 - FFFF.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

***SourceVolumeID:TargetVolumeID . . . | -***

(Required). Specifies the Remote Mirror and Copy volume relationship for the source and target volume pairs that is to be removed.

**Note:** Provide a single volume ID instead of a volume pair if you use the **-unconditional** parameter. Specifying pairs results in a format error.

This parameter accepts fully qualified volume IDs, which includes storage image IDs or a shortened version without storage image IDs, if the **-dev** parameter is specified. You must separate multiple Remote Mirror and Copy pair IDs with spaces.

A Remote Mirror and Copy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a Remote Mirror and Copy relationship. You must separate the two volume IDs of a Remote Mirror and Copy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

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**-remotedev** *storage\_image\_ID*

(Optional). Specifies the target storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified target LSS ID or if the **-dev** parameter is used.

Example: IBM.1750-68FA120

**-srcss** *ss\_ID*

(Optional). Specifies the subsystem ID of the primary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

**-tgtss** *ss\_ID*

(Optional). Specifies the subsystem ID of the secondary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM System Storage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

*Source\_LSS\_ID:Target\_LSS\_ID . . . | -*

(Required). Specifies that a consistency group for the source and target LSSs with the IDs specified be removed from the long busy state.

This parameter accepts fully qualified LSS IDs, which includes the storage image ID, or a shortened version without the storage image ID if the **-dev** parameter is specified.

A remote mirror and copy path LSS pair ID consists of two LSS IDs, one designated as the source LSS and the other as the target LSS for a remote mirror and copy path relationship. The two LSS IDs must be separated with a colon and no spaces. Multiple remote mirror and copy path LSS pair IDs must be separated with a space between each value. The first LSS ID is the source LSS. The second LSS ID is the target LSS.

The fully qualified LSS ID format is *storage\_image\_ID/xx*, where *xx* is a hexadecimal number in the range 00 - 1F (1750 only).

If you use the dash (-), the specified value is read from standard input.

Example pair: 00:00

Example of multiple pairs: 00:00 01:01 02:02

## Example (1750)

### Invoking the unfreezepprc command

```
dscli>unfreezepprc -dev IBM.1750-68FA120
-remotedev IBM.1750-68FA150 01:01
```

### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

```
Remote Mirror and Copy pair ID 01:01
successfully thawed.
```



## Global Mirror commands

This section contains commands that are used to create, manage, and delete Global Mirror relationships and to display Global Mirror information.

Use the following commands to create, manage, and delete Global Mirror relationships and to display Global Mirror information:

- mkgmir
- pausegmir
- resumegmir
- rmgmir
- showgmir
- showgmircg
- showgmiroos

The **mkgmir** command starts Global Mirror processing for a specified session.

The **pausegmir** command pauses Global Mirror processing for the specified session. There are 2 primary reasons to pause Global Mirror processing:

- To repair a part of the Global Mirror infrastructure, such as: Global Copy volume pairs or FlashCopy pairs
- To make modifications to the Global Mirror tuning parameters

The **resumegmir** command resumes Global Mirror processing for a specified session. If you have issued a **pausegmir** command to pause Global Mirror processing, issue the **resumegmir** command to continue Global Mirror processing.

The **rmgmir** command ends Global Mirror processing for the specified session.

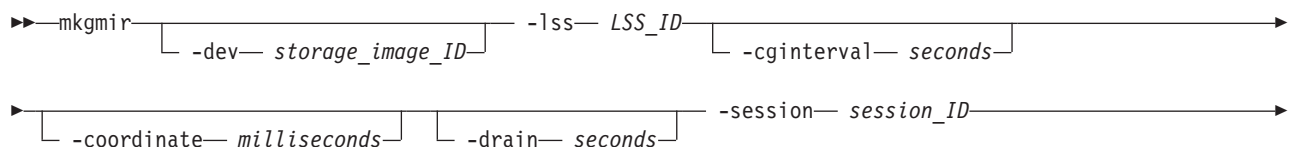
The **showgmir** command generates two reports. The first report displays the detailed properties about the current Global Mirror operations that are associated with a specified logical subsystem ID. The second report displays the performance metrics for the current Global Mirror operations that are associated with a specified logical subsystem ID.

The **showgmircg** command generates a report that displays the consistency group status for the specified Global Mirror session.

The **showgmirroos** command generates a report that displays the number of unsynchronized (out of sync) tracks for the specified Global Mirror session.

## mkgmir

The **mkgmir** command starts Global Mirror for a specified session.



Master\_Control\_Path\_LSS\_ID:Subordinate\_Control\_Path\_LSS\_ID

...

" \_ "

## Parameters

**Note:** If you are using the Cisco MDS 9216 Multilayer Fabric Switch, you must not enable the write acceleration feature. The **mkgmir** command might fail if the write acceleration feature is enabled.

**-dev** *storage\_image\_ID*

(Optional). Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified LSS ID, which includes a storage image ID.

Example: IBM.1750-68FA120

**-lss** *LSS\_ID*

(Required). Specifies the master logical subsystem (LSS) that receives the **mkgmir** command. This parameter accepts a fully qualified master LSS ID, which includes either the storage image ID or a shortened version without the storage image ID if the **-dev** parameter is specified.

Example of a fully qualified LSS ID: IBM.1750-68FA120/10

**-cginterval** *seconds*

(Optional). Specifies the consistency group interval time, in seconds. This number specifies how long to wait between the formation of consistency groups. If this number is not specified or is set to zero, consistency groups are formed continuously. The consistency group interval setting is required for a start action. If not specified, the default interval is zero. The consistency group interval setting can be modified for a resume action; otherwise, the interval that is specified for the start action is maintained.

The maximum value is 65 535 seconds.

**-coordinate** *milliseconds*

(Optional). Specifies the maximum coordination interval, in milliseconds. This value indicates the maximum time that Global Mirror processing queues Primary/Host/IO to start forming a consistency group. The coordination interval setting is required for a start action. If this value is not specified, the default interval is 50 milliseconds.

The coordination interval setting can be modified for a resume action; otherwise, the interval that is specified for the start action is maintained. The maximum value is 65 535 milliseconds.

**-drain** *seconds*

(Optional). Specifies the maximum consistency group drain time in seconds and the maximum amount of time that the consistent set of data is allowed to drain to the remote site before failing the current consistency group. The drain time setting is required for a start action. If the drain time is not specified, the default drain time is 30 seconds.

The drain time setting can be modified for a resume action; otherwise, the time that is specified for the start action is maintained.

**-session** *session\_ID*

(Required). Specifies that Global Mirror for the specified session be started or resumed. A session ID is a Global Mirror session number that you assign in the 01 - FF hexadecimal range.

Example: 01

**Master\_Control\_Path\_LSS\_ID:Subordinate\_Control\_Path\_LSS\_ID . . . | -**

(Optional). Specifies one or more Global Mirror associations. A Global Mirror association consists of two fully qualified LSS IDs. The first is designated as the master resource and the second is the subordinate resource between which a PPRC path has been established. An LSS ID is two characters in the 00 - 1F (1750 only) hexadecimal range. You must separate the fully qualified LSS IDs of a Global Mirror association with a colon and no spaces. The master resource must be identical for all relationships.

If you use the dash (-), the specified value is read from standard input. However, you cannot use the dash (-) if you are using the DS CLI interactive mode.

Example of one Global Mirror association with a single subordinate in the configuration: IBM.1750-68FA120/00: IBM.1750-68FA150/00

Example of multiple Global Mirror associations with two subordinates in the configuration: IBM.1750-68FA120/00: IBM.1750-68FA150/00  
IBM.1750-68FA120/00: IBM.1750-68FA150/01

## Example (1750)

### Invoking the mkgmir command

```
dscli>mkgmir -dev IBM.1750-68FA120 -lss 10
-session 01 IBM.1750-68FA120/00:IBM.1750-68FA150/00
```

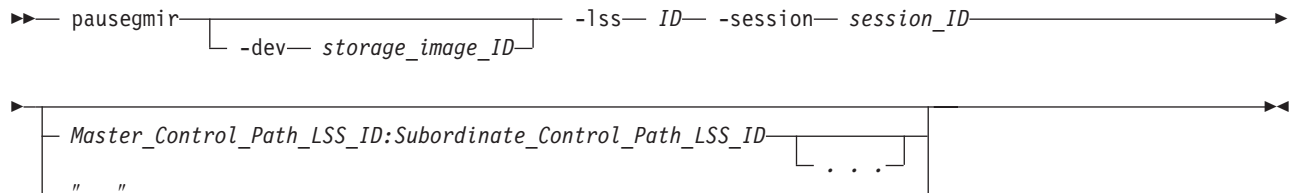
### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

Global Mirror for session 01 successfully started.

### pausegmir

The **pausegmir** command pauses Global Mirror for the specified session.



## Parameters

**-dev** *storage\_image\_ID*

(Optional). Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified LSS ID.

Example: IBM.1750-68FA120

### **-lss *ID***

(Required). Specifies the master logical subsystem (LSS) that receives the **pausegmir** command. Accepts a fully qualified master LSS ID, which includes the storage image ID, or a shortened version without the storage image ID if the **-dev** parameter is specified.

Example of a fully qualified LSS ID: IBM.1750-68FA120/10

### **-session *session\_ID***

(Required). Specifies the session ID for which the Global Mirror process is to be paused. A session ID is a Global Mirror session number that you assign in the 01 - FF hexadecimal range.

Example: 01

### ***Master\_Control\_Path\_LSS\_ID:Subordinate\_Control\_Path\_LSS\_ID . . . | -***

(Optional). Specifies one or more Global Mirror path associations. A Global Mirror (Asynchronous PPRC) path association consists of two fully qualified LSS IDs, one designated as the master resource and the other as the subordinate resource between which a remote copy and mirror path has been established.

A LSS ID is two hexadecimal characters in the range 00 - 1F (1750 only). You must separate the fully qualified LSS IDs of a Global Mirror path association with a colon and no spaces. The master resource must be identical for all relationships.

If you use the dash (-), the specified value is read from standard input. However, you cannot use the dash (-) if you are using the DS CLI interactive mode.

Example of one Global Mirror association with a single subordinate in the configuration: IBM.1750-68FA120/00: IBM.1750-68FA150/00

Example of multiple Global Mirror associations with two subordinates in the configuration: IBM.1750-68FA120/00: IBM.1750-68FA150/00  
IBM.1750-68FA120/00: IBM.1750-68FA150/01

## **Example (1750)**

### **Invoking the pausegmir command**

```
dscli>pausegmir -dev IBM.1750-68FA120 -lss 10
-session 01 IBM.1750-68FA120/00:IBM.1750-68FA150/00
```

### **The resulting output**

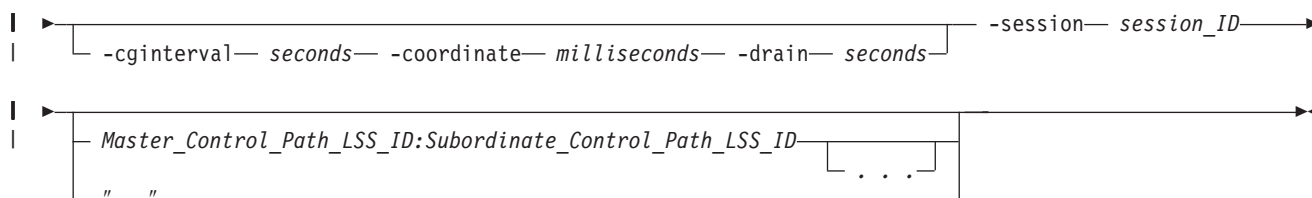
```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

Global Mirror for session 01 successfully paused.

### **resumegmir**

The **resumegmir** command resumes Global Mirror processing for a specified session.

```
| ►► resumegmir [-dev storage_image_ID] -lss LSS_ID ►
```



## Parameters

```
-dev storage_image_ID
```

(Optional). Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified LSS ID or you do not specify a value for the *devic* variable in your profile file.

Example: IBM.1750-68FA120

-1ss *LSS\_ID*

(Required). Specifies the master logical subsystem (LSS) that is to receive the **resumegmir** command. Accepts a fully qualified LSS ID, which includes the storage image ID, or a shortened version without the storage image ID if the **-dev** parameter is specified. The shortened version is two hexadecimal digits in the range 00 - 1F (1750 only).

Example of a fully qualified LSS ID: IBM.1750-68FA120/10

Tuning parameters consist of the following three values: **-cginterval** *seconds* , **-coordinate** *milliseconds* , **-drain** *seconds*

Tuning parameters have default values applied to them from the microcode. However, you can choose to change those values. You must designate a value for each of the parameters even if you are changing only one value. For example, if you decide to change only the value on the **-cginterval** parameter from 0 to 1, your command must include the default values for the other two parameters. Your command would look like the following:

```
dscli>resumegmir IBM.1750-68FA120/10
-cginterval 1 -coordinate 50 -drain 30 -session 01
IBM.1750-68FA120/00:IBM.1750-68FA150/00
```

**-cginterval** *seconds*: Specifies the consistency group interval time, in seconds. This number specifies how long to wait between the formation of consistency groups. If this number is not specified or is set to zero, consistency groups are formed continuously.

The default value is 0. The maximum value is 65 535 seconds.

**-coordinate milliseconds:** Specifies the maximum coordination interval, in milliseconds. This value indicates the maximum time that Global Mirror processing queues Primary/Host/IO to start forming a consistency group. The default value is 50 milliseconds. The maximum value is 65 535 milliseconds.

**-drain seconds:** Specifies the maximum consistency group drain time in seconds and the maximum amount of time that the consistent set of data is allowed to drain to the remote site before failing the current consistency group. The default drain time is 30 seconds.

-**session** *session ID*

(Required). Specifies the Global Mirror session that is to be started. A session ID is a Global Mirror session number that you assign in the 01 - FF hexadecimal range.



**-dev** *storage\_image\_ID*

(Optional). Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified LSS ID.

Example: IBM.1750-68FA120

**-quiet**

(Optional). Turns off the confirmation prompt for this command.

**-force**

(Optional). Forces the Global Mirror process to stop regardless of the state of the Global Mirror associations.

**-subordinate**

(Optional). Indicates that the **-lss** parameter specifies a subordinate LSS ID.

**-lss** *ID*

(Required). Specifies the logical subsystem (LSS) that is participating in the Global Mirror session. Accepts a fully qualified LSS ID, which includes the storage image ID or a shortened version without the storage image ID, if the **-dev** parameter is specified.

Example of a fully qualified LSS ID: IBM.1750-68FA120/10

**-session** *session\_ID*

(Required). Specifies the session ID for which the Global Mirror path association will be removed. A session ID is a Global Mirror session number that you assign in the 01 - FF hexadecimal range.

Example: 01

**Master\_Control\_Path\_LSS\_ID:Subordinate\_Control\_Path\_LSS\_ID . . . | -**

(Optional). Specifies one or more Global Mirror path associations. A Global Mirror path association consists of two fully qualified LSS IDs. The first is designated as the master resource and the second is the subordinate resource between which there is a remote mirror and copy path. A LSS ID is two hexadecimal characters in the range 00 - 1F (1750 only). You must separate the fully qualified LSS IDs of a Global Mirror association with a colon and no spaces. The master resource must be identical for all relationships.

If you use the dash (-), the specified value is read from standard input. However, you cannot use the dash (-) if you are using the DS CLI interactive mode.

Example of one Global Mirror path association with a single subordinate in the configuration: IBM.1750-68FA120/00: IBM.1750-68FA150/00

Example of multiple Global Mirror path associations with two subordinates in the configuration: IBM.1750-68FA120/00: IBM.1750-68FA150/00  
IBM.1750-68FA120/00: IBM.1750-68FA150/01

## Example (1750)

### Invoking the rmgmir command

```
dsccli>rmgmir -dev IBM.1750-68FA120 -lss 10
-session 01 IBM.1750-68FA120/00:IBM.1750-68FA150/00
```

### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120

Are you sure you want to stop Session ID 01? [y/n]: Y  
Global Mirror for Session ID 01 successfully stopped.

## showgmir

The **showgmir** command displays properties and performance metrics for a Global Mirror logical subsystem ID. You can issue this command on either the master storage unit or on any of the subordinate storage units. The report that is generated by this command varies significantly depending on which storage unit that you issue the command and the parameters that you specify.

►— showgmir —┬─ -dev— storage\_image\_ID ┬─ -metrics ┬─ LSS\_ID ──►

## Parameters

### -dev storage\_image\_ID

(Optional). Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified logical subsystem (LSS) ID or you do not specify a value for the *devid* variable in your profile file.

Example: IBM.1750-68FA120

### -metrics

(Optional). Specifies that the logical subsystem ID and its performance statistics be displayed.

### LSS\_ID | -

(Required). Specifies the logical subsystem (LSS) that receives the **showgmir** command. This parameter accepts a fully qualified LSS ID, which includes the storage image ID or a shortened version without the storage image ID if the **-dev** parameter is specified. The LSS ID is two hexadecimal digits in the range 00 - 1F (1750 only).

If you use the dash (-), the specified value is read from standard input. However, you cannot use the dash (-) if you are using the DS CLI interactive mode.

Example of a fully qualified LSS ID: IBM.1750-68FA120/10

## Note:

The type of report that you receive is determined by the value that you specify for the LSS ID as follows:

- When you issue the **showgmir** command from the master storage unit and you specify an LSS ID that is the same type (both even numbers or both odd numbers) as the master, you receive the following results:
  - Without the **-metrics** parameter: A properties report that includes the master information
  - With the **-metrics** parameter: A properties and performance values report.
- When you issue the **showgmir** command from the master storage unit and you specify an LSS ID that is not the same type (one even number and one odd number) as the master, you receive the following results:



- Without the **-metrics** parameter: A properties report that displays only the fully qualified LSS\_ID value and all the other input fields display a null (-) value.
- With the **-metrics** parameter: A properties and performance report that displays only the fully qualified LSS\_ID value and all the other input fields display a null (-) value.
- When you issue the **showgmir** command from the subordinate storage unit and you specify an LSS ID that is the same type (both even numbers or both odd numbers) as the master, you receive the following results:
  - Without the **-metrics** parameter: A detailed properties report that displays only the master information (fully-qualified LSS ID, master session ID, and master storage unit ID). All the other fields display as a null (-) value.
  - With the **-metrics** parameter: A detailed properties and performance values report that displays only the master information (fully qualified LSS ID, master session ID, and master storage unit ID). All the other fields display as a null (-) value.
- When you issue the **showgmir** command from the subordinate storage unit and you specify an LSS ID that is *not* the same type (one even number and one odd number) as the master, you receive the following results:
  - Without the **-metrics** parameter: A properties report that displays only the fully qualified LSS\_ID value. All the other input fields on the report display a null (-) value.
  - With the **-metrics** parameter: A properties and performance report that displays only the fully qualified LSS\_ID value. All the other input fields on the report display a null (-) value.

### Example (metrics not specified)

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **showgmir** command. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the machine type designation, 2107 versus 1750.

**Note:** The following example presumes that you have issued the **showgmir** command with an LSS ID that matches the master storage unit.

### Invoking the showgmir command

```
dscli>showgmir
-dev IBM.2107-75FA120 10
```

### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.2107-75FA120
```

| ID                  | Master Count | Master Session ID | Copy State | Fatal Reason | CG Interval (seconds) | Global Mirror (seconds) | Local Mirror (seconds) | Current Time (seconds)  |
|---------------------|--------------|-------------------|------------|--------------|-----------------------|-------------------------|------------------------|-------------------------|
| IBM.2107-1300861/14 | 1            | 0x25              | Running    | Not Fatal    | 0                     | 50                      | 30                     | 10/25/2006 13:45:44 PDT |

| CG Time                 | Successful CG Percentage | Flash-Copy Sequence Number | Master ID        | Subordinate Count | Master/Subordinate Assoc                 |
|-------------------------|--------------------------|----------------------------|------------------|-------------------|------------------------------------------|
| 10/25/2006 13:45:44 PDT | 100                      | 0x453-FCCF8                | IBM.2107-1300861 | 1                 | IBM.2107-1300861/14: IBM.2107-1300321/14 |

## Report field definitions

**ID** Specifies the LSS ID that consists of a storage image ID followed by two hexadecimal characters 00 - 1F (1750 only) that identify a Global Mirror (asynchronous remote mirror and copy) master LSS ID.

### Master Count

Specifies the number of Global Mirror (asynchronous remote mirror and copy) masters. This value could be zero if none exist. When the value is zero, the master information fields of the report display a null (-) value

### Master Session ID

Identifies the session ID that you assigned, 01 - FF hexadecimal range.

### Copy State

Identifies the Global Mirror (asynchronous remote mirror and copy) copy state. The displayed value is one of the following:

#### Running

Indicates that the Global Mirror copy process is running.

#### Paused

Indicates that the Global Mirror copy process is paused.

#### Fatal

Indicates that the Global Mirror copy process is failed.

#### Pause In Progress

Indicates that the Global Mirror copy process is in the process of pausing.

### Fatal Reason

Specifies a reason code for the failure. The displayed value is one of the following:

#### Time out

#### Revert FLC Failed Timeout

#### Revert FLC Failed

#### Not Fatal

**Invalid Session ID**

**Inaccessible or Failed**

**Consistency Check Not Completed**

**Consistency Check Failed**

**Communication Failure**

**CG Corrupted**

**Busy Condition Preventing**

**CG Interval Time (seconds)**

Specifies the consistency group interval time between attempts to form a consistency group, up to 65 535 seconds.

**Coord. Time (milliseconds)**

Specifies the maximum extended distance coordination interval. The default time is 50 milliseconds.

**Max CG Drain Time (seconds)**

Specifies the consistency group drain time. The consistency group drain time is the maximum time that the consistent set of data is allowed to drain to the remote site before failing the current consistency group. The maximum allowed time is 65 535 seconds.

**Current Time**

Indicates the time stamp for when this report was generated. The date is displayed in the *MM/DD/YYYY* format. The time is displayed in the *HH:MM:SS* format on a 24-hour clock.

**Note:** If the clock is automatically adjusted at applicable times between standard and daylight saving time, daylight saving time is set to 1. If the clock is not automatically adjusted for daylight saving time, set to 0. For example, the report would display 12/04/2006 08:00:00 MST 0 if the clock is not automatically adjusted for daylight saving time.

**CG Time**

Specifies the recorded time stamp when the last successful consistency group was formed.

**Successful CG Percentage**

Specifies the percentage of successful attempts to form a consistency group, from 0% to 100%.

**FlashCopy Sequence Number**

Specifies the FlashCopy sequence number that is associated with the current consistency group.

**Note:** This value does not apply to a 2105; a null (-) value is displayed in this column when a machine type 2105 is queried.

**Master ID**

Specifies the Global Mirror master storage image ID.

**Subordinate Count**

Specifies the count of subordinate associations (with an allowed value of 1 to 16). The master-subordinate association fields repeat according to this count.

### Master/Subordinate Assoc

Specifies the Global Mirror path associations. A Global Mirror path association consists of two fully qualified LSS IDs. One ID is designated as the master resource and the other ID is designated as the subordinate resource; a remote mirror and copy path has been established between the two resources.

### Example (metrics specified)

The following tables represent the headers that are displayed on the output report that is associated with the **showgmir** command using the **-metrics** parameter. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the machine type designation, 2107 versus 1750.

**Note:** The following example presumes that you have issued the **showgmir** command with an LSS ID that matches the master storage unit.

### Invoking the showgmir command

```
dscli>showgmir -dev IBM.2107-75FA120 -metrics 10
```

### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0  
DS: IBM.2107-75FA120

| ID                  | Total Failed CG Count | Total Successful CG Count | Successful CG Percentage | Failed CG after Last Success | Last Successful CG Form Time | Coord. Time (milliseconds) | CG Interval Time (seconds) |
|---------------------|-----------------------|---------------------------|--------------------------|------------------------------|------------------------------|----------------------------|----------------------------|
| IBM.2107-75FA120/10 | 2                     | 3                         | 40                       | 2                            | 01/13/1970 13:08:37 PST      | 50                         | 5                          |

| Max CG Drain Time (seconds) | First Failure Control Unit | First Failure LSS | First Failure Status | First Failure Reason | First Failure Master State | Last Failure Control Unit | Last Failure LSS |
|-----------------------------|----------------------------|-------------------|----------------------|----------------------|----------------------------|---------------------------|------------------|
| 240                         | IBM.2107-75FA120           | 0x05              | Error                | Long Busy            | Error Recovery             | IBM.2107-75FA120          | 0x05             |

| Last Failure Status | Last Failure Reason | Last Failure Master State | Previous Failure Control Unit | Previous Failure LSS | Previous Failure Status | Previous Failure Reason | Previous Failure Master State |
|---------------------|---------------------|---------------------------|-------------------------------|----------------------|-------------------------|-------------------------|-------------------------------|
| Error               | Long Busy           | Error Recovery            | IBM.2107-75FA120              | 0x05                 | Error                   | Long Busy               | Error Recovery                |

### Report field definitions

**ID** Identifies the LSS ID. This ID consists of a storage image ID that is

followed by two hexadecimal characters 00 - 1F (1750 only) that identify a Global Mirror (Asynchronous PPRC) master LSS ID.

**Total Failed CG Count**

Specifies the total number of consistency groups that did not complete in the user-specified drain time.

**Total Successful CG Count**

Identifies the total number of consistency groups that completed before the user-specified drain time.

**Successful CG Percentage**

Identifies the percentage of attempts that were successful in forming a consistency group.

**Failed CG after Last Success**

Specifies the total number of failed consistency groups after the last successful completion.

**Last Successful CG Form Time**

Identifies the last successful consistency group completion time.

**Coord. Time (milliseconds)**

Specifies the value in milliseconds that indicates the maximum amount of time that Global Mirror queues the primary host I/O to start forming a consistency group. The default is 50 milliseconds.

**CG Interval Time (seconds)**

Specifies the value in seconds that indicates how long to wait between formation of consistency groups.

**Max CG Drain Time (seconds)**

Specifies the value in seconds that indicates the maximum amount of time that Global Mirror allows for the consistent set of data to drain to the remote site.

**First Failure Control Unit**

Identifies the Control Unit MTS that has caused the first failure of the consistency group formation.

**First Failure LSS**

Identifies the LSS number that has caused the first failure of the consistency group formation.

**First Failure Status**

Indicates the first failure status of the consistency group formation. The "First Failure Reason" and "First Failure Master State" fields display data only when this field contains "Error".

**First Failure Reason**

Specifies the error reason of the first failure of the consistency group formation attempt.

**First Failure Master State**

Identifies the master state for the first Global Mirror failure.

**Last Failure Control Unit**

Identifies the Control Unit MTS that has caused the last failure of the consistency group formation.

**Last Failure LSS**

Identifies the LSS number that has caused the last failure of the consistency group formation.

Indicates the last failure status of the consistency group formation. The "Last Failure Reason" and "Last Failure Master State" fields display data only when this field contains "Error".

Specifies the error reason of the last failure of the consistency group formation attempt.

Identifies the master state for the last Global Mirror failure.

Identifies the Control Unit MTS that has caused the previous failure of the consistency group formation.

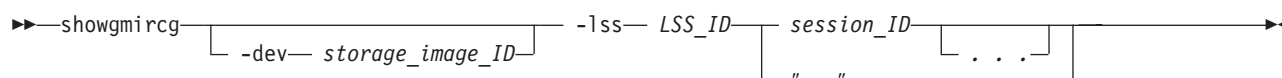
Identifies the LSS number that has caused the previous failure of the consistency group formation.

Indicates the previous failure status of the consistency group formation. The “Previous Failure Reason” and “Previous Failure Master State” fields display data only when this field contains “Error”.

Specifies the error reason of the previous failure of the consistency group formation attempt.

Specifies the master state for the previous Global Mirror failure.

The **showgmircg** command displays consistency group status for the specified Global Mirror session.



```
-dev storage_image_ID
```

(Optional). Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified LSS ID, which includes a storage image ID.

Example: IBM.1750-68FA120

(Required). Specifies the master logical subsystem (LSS) that receives the **showgmircg** command. LSS ID consists of two hexadecimal characters in the range of 00 - 1F (1750 only).

Accepts a fully qualified master LSS ID, which includes either the storage image ID or a shortened version without the storage image ID if the **-dev** parameter is specified.

Example of a fully qualified LSS ID: IBM.1750-68FA120/10

*session\_ID* . . . | -  
 | (Required). Specifies one or more sessions to display. A session ID is a Global  
 | Mirror session number that you assign in the 01 - FF hexadecimal range.  
 |  
 | If you use the dash (-), the specified value is read from standard input.  
 | However, you cannot use the dash (-) if you are using the DS CLI interactive  
 | mode.  
 |  
 | Example: 01

## Example

A separate example is not shown for the 1750 as the information is the same for both. The only difference is the machine type designation, 2107 versus 1750.

## Invoking the showgmircg command

```
dscli>showgmircg -dev IBM.2107-75FA120 -lss 01 10
```

## The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
```

```
LSS ID IBM.2107-75FA120/10
Session 01
CG Status 0
```

## Report field definitions

The following supplies information that you can use to help you understand the output that is generated from this command.

### LSS ID

Indicates the logical subsystem ID.

### Session

Indicates the Global Mirror session number.

### CG Status

Indicates the Global Mirror Consistency Group status (primarily used by Field Engineering).

## showgmirroos

The **showgmirroos** command displays the number of unsynchronized (out of sync) tracks for the specified Global Mirror session.

```

▶▶—showgmirroos—┬──────────────────┬──────────┬──────────┬──────────▶
 └─dev─ storage_image_ID─┘ └─si─┘ └─lss─ LSS_ID─
 └──────────────────┘ └──ls─┘

▶ session_ID─┬──────────────────┬──────────┬──────────┬──────────▶
 └─"_"─┘

```

## Parameters

**Note:** You might want to use this command to assist you in the following circumstances:

- To see how data is transferring. The **showgmirroos** command lets you see how far behind the remote site is from the local site in the transfer of data. The displayed value represents how many tracks must be transferred to catch up (be synchronized).

- You are not able to form consistency groups because you have exceeded the maximum drain time. The number of tracks that are not synchronized might be an indicator that you must adjust some values to allow for complete processing.

**-dev** *storage\_image\_ID*

(Optional). Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified LSS ID, which includes a storage image ID.

Example: IBM.1750-68FA120

**-scope** *si | lss*

(Required) Specifies the scope of the data to be returned: storage image (si) or logical subsystem (lss).

**-lss** *LSS\_ID*

(Required). Specifies the master logical subsystem (LSS) that receives the **showgmiroos** command. Accepts a fully qualified master LSS ID, which includes either the storage image ID or a shortened version without the storage image ID if the **-dev** parameter is specified. The LSS ID is two hexadecimal digits in the range 00 - 1F (1750 only).

Example of a fully qualified LSS ID: IBM.1750-68FA120/10

*session\_ID* -

(Required). Specifies the session to display. A session ID is a Global Mirror session number that you assign in the 01 - FF hexadecimal range.

If you use the dash (-), the specified value is read from standard input. However, you cannot use the dash (-) if you are using the DS CLI interactive mode.

## Example

A separate example is not shown for the 1750 as the information is the same for both. The only difference is the machine type designation, 2107 versus 1750.

### Invoking the showgmiroos command

```
dscli>showgmiroos -dev IBM.2107-75FA120 -scope si -lss 10 01
```

### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
```

```
Scope IBM.2107-75FA120
```

```
Session 01
```

```
OutOfSyncTracks 3
```

### Report field definitions

The following supplies information that you can use to help you understand the output that is generated from this command.

**Scope** Indicates the scope of the returned information (storage image or logical subsystem).

**Session**

Indicates the Global Mirror session number.

**OutOfSyncTracks**

Indicates the number of unsynchronized tracks.



## Global Mirror session commands

This section contains commands that are used to create, modify, and delete Global Mirror sessions and to display Global Mirror session information.

Use the following commands to create, modify, and delete Global Mirror sessions and to display Global Mirror session information:

- **mksession**
- **chsession**
- **lsession**
- **rmsession**

The **mksession** command opens a Global Mirror session.

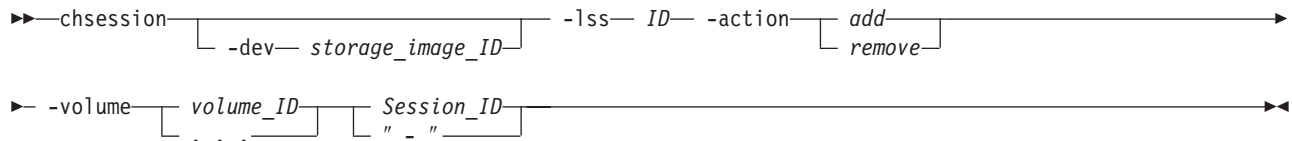
The **chsession** command allows you to modify a Global Mirror session.

The **lsession** command generates a report that displays a list of Global Mirror sessions for a logical subsystem (LSS) and information regarding the volumes associated with each session in the list.

The **rmsession** command closes an existing Global Mirror session.

### **chsession:**

The **chsession** command allows you to modify a Global Mirror session.



### Parameters

#### **-dev storage\_image\_ID**

(Optional). Specifies the ID of the storage image containing the logical subsystem. The storage image ID includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the LSS ID and you do not specify a value for the *devid* variable in your profile file.

Example: IBM.1750-68FA120

#### **-lss ID**

(Required). The logical subsystem (LSS) ID for the Global Mirror session. The format of the LSS ID is a hexadecimal number in the range 00 - 1F (1750 only).

Accepts a fully qualified LSS ID, which includes either the storage image ID or a shortened version without the storage image ID if the **-dev** parameter is specified.

Example of a fully qualified LSS ID: IBM.1750-68FA120/10

#### **-action add | remove**

(Required).

**add** Specifies that volumes be added to the session.

**remove**

Specifies that volumes be removed from the session.

**-volume** *volume\_ID* . . .

(Required). Specifies an array of one or more volume IDs or volume ID ranges to be added or removed for the Global Mirror session. All volumes must share a common logical subsystem.

To specify a range of volume IDs, you must separate the volume IDs with a hyphen. To specify a combination of one or more volume IDs and a range of volume IDs, separate the volume IDs and ranges with commas.

Do not qualify the volume ID with the storage image ID. The volume ID is a 32 bit number that can be represented as 4 hexadecimal digits in the form of *XYZZ* where *X* is the address group (0 - 1), *XY* together is the logical subsystem number 00 - 1E (for 1750), and *ZZ* is the volume number (00 - FF).

Example of a volume ID: 0010

Example of a range of volume IDs: 0010-001F

Example of multiple volume IDs and ranges: 0100-010F,0180-018F,0120

**Session\_ID** | -

(Required). Specifies the Global Mirror session that is modified for this session ID. A session ID is a hexadecimal number in the range 01 - FF.

If you use the dash (-), the specified value is read from standard input.

Example of a session ID: 01

**Example (1750)****Invoking the chsession command**

```
dscli>chsession -dev IBM.1750-68FA120 -lss 10 -action add
-volume 1000-1010 01
```

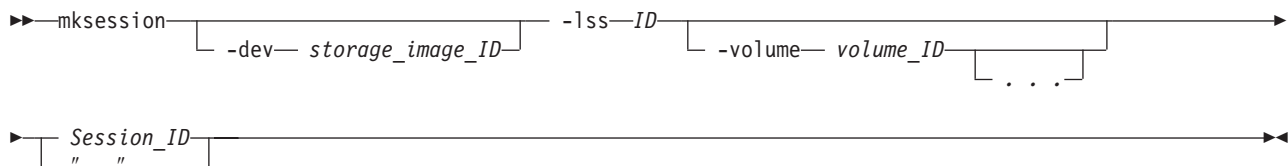
**The resulting output**

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

Global Mirror session 01 successfully modified.

**mksession:**

The **mksession** command opens a Global Mirror session.

**Parameters****-dev** *storage\_image\_ID*

(Optional). Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the logical subsystem.

Example: IBM.1750-68FA120

**-lss *ID***

(Required). Creates a Global Mirror session for this logical subsystem. Accepts a fully qualified LSS ID, which includes the storage image ID, or a shortened version without the storage image ID if the **-dev** parameter is specified. The LSS ID is a hexadecimal number in the range of 00 - 1F (1750 only).

Example of a fully qualified LSS ID: IBM.1750-68FA120/10

**-volume *volume\_ID* . . .**

(Optional). Specifies an array of one or more volume IDs or a range of volume IDs to be included in the Global Mirror session. All volumes must share a common logical subsystem.

To specify a range of volume IDs, you must separate the volume IDs with a hyphen. To specify a combination of one or more volume IDs and a range of volume IDs, separate the volume IDs and ranges with commas.

Do not qualify the volume ID with the storage image ID. The volume ID is a 32 bit number that can be represented as 4 hexadecimal digits in the form of *XYZZ* where *X* is the address group (0 - 1), *XY* together is the logical subsystem number 00 - 1E (for 1750), and *ZZ* is the volume number (00 - FF).

Example of a volume ID: 0010

Example of a range of volume IDs: 0010-001F

Example of multiple volume IDs and ranges: 0100-010F,0180-018F,0120

***Session\_ID* | -**

(Required). Specifies the session ID for which Global Mirror processing is allowed. A session ID is a hexadecimal number in the range 01 - FF.

If you use the dash (-), the specified value is read from standard input.

Example of a session ID: 01

**Example (1750)**

**Invoking the mksession command**

```
dscli>mksession -dev IBM.1750-68FA120 -lss 10 -volume 1000-100F 01
```

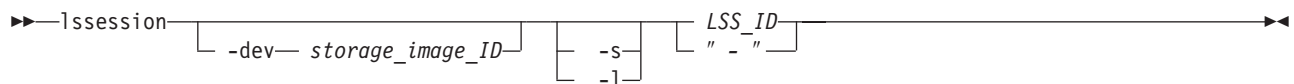
**The resulting output**

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

```
Global Mirror session ID 01 successfully opened.
```

**lssession:**

The **lssession** command displays a list of Global Mirror sessions for a logical subsystem (LSS) and information regarding the volumes of each session in the list.



## Parameters

### **-dev** *storage\_image\_ID*

(Optional). Specifies the storage image ID, which includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified ID for the logical subsystem.

Example: IBM.1750-68FA120

**-s** (Optional). Displays the session IDs. You cannot use the **-l** and the **-s** parameters together.

**-l** (Optional). Displays the default output. You cannot use the **-l** and the **-s** parameters together.

### *LSS\_ID* | -

(Required). Specifies the logical subsystem (LSS) ID for the Global Mirror session. The format of the LSS ID is a hexadecimal value in the range 00 - 1F (1750 only).

This parameter accepts a fully qualified LSS ID, which includes the storage image ID, or a shortened version without the storage image ID if the **-dev** parameter is specified.

If you use the dash (-), the specified value is read from standard input. However, you cannot use the dash (-) if you are using the DS CLI interactive mode.

Example of a fully qualified LSS ID: IBM.1750-68FA120/10

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

The following tables represent the headers that are displayed on the output report that is associated with the **lssession** command using the **-l** parameter. A separate example is not shown for the 1750 because the information is the same for both machine types. The only difference is the machine type designation, 2107 versus 1750.

When you use the **-s** parameter with the **lssession** command only 3 ID items are displayed in the resulting report: LSSID, SessionID, and VolumeID. A separate example is shown for this scenario.

### Invoking the **lssession** command using the **-l** parameter

```
dscli>lssession -dev IBM.2107-75FA120 -l 01
```

### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0  
DS: IBM.2107-75FA120

| LSSID               | Session | Status | Volume                | Volume-Status |
|---------------------|---------|--------|-----------------------|---------------|
| IBM.2107-75FA120/10 | 01      | Normal | IBM.2107-75FA120/1001 | Active        |

| LSSID               | Session | Status | Volume                | Volume-Status  |
|---------------------|---------|--------|-----------------------|----------------|
| IBM.2107-75FA120/10 | 01      | Normal | IBM.2107-75FA120/1002 | Active         |
| IBM.2107-75FA120/10 | 01      | Normal | IBM.2107-75FA120/1003 | Active         |
| IBM.2107-75FA120/10 | 02      | Normal | IBM.2107-75FA120/1011 | Active         |
| IBM.2107-75FA120/10 | 02      | Normal | IBM.2107-75FA120/1012 | Remove Pending |
| IBM.2107-75FA120/10 | 02      | Normal | IBM.2107-75FA120/1013 | Join Pending   |

| Primary-Status      | Secondary-Status  | First-Pass-Complete | Allow-Cascading |
|---------------------|-------------------|---------------------|-----------------|
| Primary Full Duplex | Secondary Simplex | True                | Disabled        |
| Primary Full Duplex | Secondary Simplex | True                | Disabled        |
| Primary Full Duplex | Secondary Simplex | True                | Disabled        |
| Primary Full Duplex | Secondary Simplex | True                | Disabled        |
| Primary Simplex     | Secondary Simplex | True                | Disabled        |
| Primary Simplex     | Secondary Simplex | False               | Disabled        |

### Invoking the `lsession` command using the `-s` parameter

```
dscli>lsession -s -dev IBM.2107-75FA120 10
```

### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.2107-75FA120
```

| LSSID | Session | Volume |
|-------|---------|--------|
| 10    | 01      | 1001   |
| 10    | 01      | 1002   |
| 10    | 01      | 1003   |
| 10    | 02      | 1011   |
| 10    | 02      | 1012   |
| 10    | 02      | 1013   |

## Report field definitions

### LSSID

Specifies the unique identifier that is assigned to this logical subsystem object. The LSS ID is a hexadecimal value in the range 00 - 1F (1750 only).

### Session

Specifies the Session ID number that you assigned in the 01 - FF hexadecimal range.

**Status** Specifies the state of the session. One of the following values is displayed:

#### CG in progress

Indicates that the consistency group for the session is in progress.

#### Increment Pending

Indicates that the Increment process is in progress.

#### Normal

Indicates that the session is in a normal state.

### Volume

Specifies the volume ID. If no volume is active for the session a null (-) value is displayed.

### VolumeStatus

Specifies the status of the volume in the session. One of the following values is displayed:

#### Join Pending

Indicates that the volume is not active for the current session. However, it will be added to the session in the next cycle.

#### Remove Pending

Indicates that the volume is active for the current session. However, it will be removed in the next cycle.

**Active** Indicates that the volume is an active member of the session.

### PrimaryStatus

Specifies the primary remote copy and mirror status of the volume. One of the following values is displayed:

#### Primary Simplex

Indicates that the volume is not part of a remote mirror and copy relationship.

#### Primary Copy Pending

Indicates that the volume is primary in a remote mirror and copy relationship and the relationship is in a Copy Pending state, which

means that the source and target volume are out-of-sync. In this situation, data still needs to be copied from the source to the target volume.

**Primary Full Duplex**

Indicates that the volume is primary in a remote mirror and copy relationship and the relationship is in a Full Duplex state, which means that the copy operation has completed and the volume pair is synchronized, and that any updates to the primary volume will be transferred synchronously to the secondary volume.

**Primary Suspended**

Indicates that the volume is primary in a remote mirror and copy relationship and the relationship is suspended, which means that the primary is no longer transferring data to the secondary, and any changed data that is at the primary will be tracked in an out-of-sync bitmap.

**- (null)**

Indicates that there are no active volumes for the session.

**SecondaryStatus**

Specifies the secondary remote copy and mirror status of the volume. One of the following values is displayed:

**Secondary Simplex**

Indicates that the volume is not part of a remote mirror and copy relationship.

**Secondary Copy Pending**

Indicates that the volume is secondary in a remote mirror and copy relationship and the relationship is in a Copy Pending state, which means that the source and target volume are out-of-sync. In this situation, data still needs to be copied from the source to the target volume.

**Secondary Full Duplex**

Indicates that the volume is secondary in a remote mirror and copy relationship and the relationship is in a Full Duplex state, which means that the copy operation has completed and the volume pair is synchronized, and that any updates to the secondary volume will be transferred synchronously from the primary volume.

**Secondary Suspended**

Indicates that the volume is secondary in a remote mirror and copy relationship and the relationship is suspended, which means that the primary is no longer transferring data to the secondary, and any changed data that is at the primary will be tracked in an Out of Sync bitmap.

**- (null)**

Indicates that there are no active volumes for the session.

**FirstPassComplete**

Specifies whether the first cycle of the volume in the global mirror relationship has ended. The value displayed is either True or False.

**AllowCascading**

Specifies whether the volume can be a secondary in a remote mirror and copy relationship. The value displayed is either Enabled or Disabled.

**rmssession:**

The **rmsession** command closes an existing Global Mirror session.

```
➤— rmsession —┬─ -dev— storage_image_ID —┬─ -lss— ID —┬─ -quiet —┬─ " - " —┬─ Session_ID —┬─➤
```

### Parameters

#### **-dev** *storage\_image\_ID*

(Optional). Specifies the ID of the storage image that contains the logical subsystem. The storage image ID includes manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified LSS ID.

Example: IBM.1750-68FA120

#### **-lss** *ID*

(Required). Specifies the logical subsystem (LSS) ID for the Global Mirror session that is being closed. The format of the LSS ID is a hexadecimal value in the range 00 - 1F (1750 only).

This parameter accepts a fully qualified LSS ID, which includes the storage image ID, or shortened version without the storage image ID if the **-dev** parameter is specified.

Example of a fully qualified LSS ID: IBM.1750-68FA120/10

#### **-quiet**

(Optional). Turns off the confirmation prompt for this command.

#### *Session\_ID* | -

(Required). Specifies the session ID on which Global Mirror processing is to be closed. A session ID is a hexadecimal number in the range 01 - FF.

If you use the dash (-), the specified value is read from standard input. However, you cannot use the dash (-) if you are using the DS CLI interactive mode.

Example of a session ID: 01

### Example (1750)

#### Invoking the **rmsession** command

```
dscli>rmsession -dev IBM.1750-68FA120 -lss 10 01
```

#### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

```
Are you sure you want to close Session ID 01? y/n Y
Global Mirror Session ID 01 closed successfully.
```

---

## Audit commands

This section contains commands that are used for audit logging.

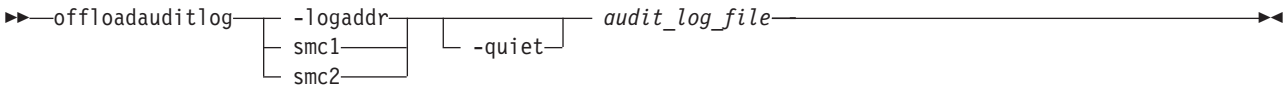
Use the **offloadauditlog** command to create activity reports for the consoles and storage units.



The **offloadauditlog** command generates an activity report for a console that includes basic information, such as, a list of who logged in, when they logged in, and what they did during their session.

## offloadauditlog

The **offloadauditlog** command provides an activity report for a console (identified as smc1 or smc2). The report includes basic information, such as, a list of who logged in, when they logged in, and what they did during their session. In addition, a log of service actions (phone connection started, phone connection ended WebSM session started, WebSM session ended) is appended to the end of the audit log.



### Parameters

#### Notes:

1. Only users with administrator authority are authorized to use this command.
2. A separate log entry is added each time a resource is created, deleted, modified. Entries are added to the audit file only after the operation has completed.
3. You must periodically extract the log using the **offloadauditlog** command and save the log file in a directory of your choice. The log file is automatically reduced (old entries removed first) by the subsystem so that it does not consume more than 50 megabytes of disk storage.  
  
When the log is 60% full, an entry ("Audit\_Log\_At\_60%") is placed in the audit log. Another entry is added when the log is 75% ("Audit\_Log\_At\_75%") full. At 100%, the log is reduced to 50% full.
4. When viewing the service actions section of the report, there might be cases where a WebSM session started entry might not have a corresponding WebSM session ended entry.
5. As noted in the example of the report, the service action report begins after the line of text that states:

"-----BEGIN SERVICE AUDIT LOG-----"

#### **-logaddr** *smc1 | smc2*

(Required) Specifies that the audit log be offloaded for the designated storage management console. The designated storage management console must be configured and available to offload the audit log successfully.

#### **-quiet**

(Optional) Specifies that the confirmation prompt be turned off.

#### *audit\_log\_file*

(Required) Specifies the file name to which the audit log entries are extracted.

**Note:** If you specify a file name that contains prior log entries, these entries are overwritten with the current data.

## Example

**Note:** The following example displays only a portion of an actual Service action report appended to the end of the Audit log report.

### Invoking the offloadauditlog command

```
dscli>dscli> offloadauditlog
-logaddr smc1 auditlog-200509.txt
```

### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0:
Audit log successfully offloaded from smc1 to file auditlog-200509.txt.
```

### Representative report

The following is an example of the report information that is extracted when you use the **offloadauditlog** command (the wrapping is done simply for clarity and is not representative of your actual report):

```
U,2005/10/04 15:08:46:834 MST,admin,1,,W,1002,User_Login_Fail,,1,
"IP = N996304B.tucson.ibm.com/9.11.178.201"
U,2005/10/04 15:29:37:432 MST,admin,1,,W,1001,User_Login_Expire,,0,
"IP = N996304B.tucson.ibm.com/9.11.178.201"
U,2005/10/04 15:32:56:979 MST,admin,1,,N,1000,User_Login,,0,
"IP = N996304B.tucson.ibm.com/9.11.178.201"
U,2005/10/04 15:34:21:020 MST,admin,1,,N,1000,User_Login,,0,
"IP = N996304B.tucson.ibm.com/9.11.178.201"
U,2005/10/05 16:54:32:171 MST,admin,1,,N,1103,
User_Password_Change,,be741104,"userName = admin"
S,2005/10/06 00:01:10:239 MST,,1,,W,1200,Audit_Log_At_60%,,,,""
U,2005/10/06 00:23:09:817 MST,admin,1,IBM.2107-AZ12341,N,2050,
Array_Create,A0,0,"A0"
U,2005/10/06 00:23:10:518 MST,admin,1,IBM.2107-AZ12341,N,2060,
Rank_Create,R0,-1,"R0"
U,2005/10/06 00:23:12:110 MST,admin,1,IBM.2107-AZ12341,N,2070,
XPool_Create,P0,0,"P0"
U,2005/10/06 00:23:12:761 MST,admin,1,,N,2073,XPool_Assign_Rank,,,""
U,2005/10/06 00:23:16:947 MST,admin,1,IBM.2107-AZ12341,N,2090,
Volume_Create,1000,0,"1000"
U,2005/10/06 00:23:17:187 MST,admin,1,IBM.2107-AZ12341,N,2090,
Volume_Create,1001,,,"1001"
S,2005/10/06 00:23:24:508 MST,,1,,W,1201,Audit_Log_At_75%,,,,""
U,2005/10/06 12:47:16:345 MST,admin,1,IBM.2107-AZ12341,N,2092,
Volume_Delete,2005,0,"2005"
U,2005/10/06 12:47:16:656 MST,admin,1,IBM.2107-AZ12341,N,2092,
Volume_Delete,2006,-1,"2006"

-----BEGIN SERVICE AUDIT LOG-----

U,2007/08/21 12:05:24:000 MST,CE,1,IBM.2107-75R0830,N,8020,
Web_SM_session_start,Web_SM_session_started,,,
U,2007/08/21 12:05:27:000 MST,CE,1,IBM.2107-75R0830,N,8022,
Web_SM_session_ended,,,
U,2007/08/24 11:59:36:000 MST,CE,1,IBM.2107-75R0830,N,8020,
Web_SM_session_start,Web_SM_session_started,,,
U,2007/08/24 12:02:31:000 MST,CE,1,IBM.2107-75R0830,N,8022,
Web_SM_session_ended,,,
U,2007/08/30 11:36:21:000 MST,CE,1,IBM.2107-75R0830,N,8020,
Web_SM_session_start,Web_SM_session_started,,,
U,2007/08/30 11:38:37:000 MST,CE,1,IBM.2107-75R0830,N,8022,
Web_SM_session_ended,,,
U,2007/09/04 16:19:36:000 MST,,1,IBM.2107-75R0830,N,8022,
Web_SM_session_ended,,,
```

```
U,2007/09/04 16:22:57:000 MST,hscroot,1,IBM.2107-75R0830,N,8020,
Web_SM_session_start,Web_SM_session_started,,,
U,2007/09/04 16:23:00:000 MST,hscroot,1,IBM.2107-75R0830,N,8022,
Web_SM_session_ended,,,,
```

## Audit Log file definitions

Fields are output in comma-separated (CSV) format. This format makes it easy to import the file into a spreadsheet. The Input Parm's field is a special case. It uses the CSV format internally to separate one input field from the next. To manage this, the entire Input Parm's field is enclosed in double quotation marks.

| Field      | Format                         | Description                                                                                                                                                                                                                                                                                                                                    |
|------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Source     | 1 char                         | Specifies the source of the log entry:<br><br><b>S</b> Represents a server event that is not associated with a user action<br><br><b>U</b> Represents a user-requested action<br><br><b>C</b> Represents a continuation line for additional input attributes. There can be multiple <b>C</b> entries for a given user-requested (U) log entry. |
| Timestamp  | YYYY/MM/DD<br>HH:MM:SS:MMM TMZ | Represents the date, time, and time zone of the log entry.                                                                                                                                                                                                                                                                                     |
| User       | 1 - 16 char                    | Represents the user account that is making the request.                                                                                                                                                                                                                                                                                        |
| MC         | 1 char, a "1" or "2"           | Represents the management console that processed the user request.                                                                                                                                                                                                                                                                             |
| Device     | 16 char                        | Represents the storage image ID that consists of the following values: manufacture, type, and serial number.                                                                                                                                                                                                                                   |
| NWC        | 1 char                         | Represents the following message types: <b>N</b> = notification, <b>W</b> = warning, and <b>C</b> = critical.                                                                                                                                                                                                                                  |
| Entry ID   | 4 char                         | Represents the unique identifier that is associated with the activity that is represented by the log entry.                                                                                                                                                                                                                                    |
| Entry name | 20 char max                    | A text description that corresponds to the Entry ID.                                                                                                                                                                                                                                                                                           |

| Field            | Format       | Description                                                                                                                                                                                                  |
|------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object ID        | 5 char max   | Represents a unique identifier that identifies the object.                                                                                                                                                   |
| Exit code        | 8 char       | Represents the final result code.                                                                                                                                                                            |
| Input Parameters | 160 char max | Represents unformatted text that includes input parameters in the format: "attr1 = value1, attr2 = value2" with a comma (,) separator between parameters and double quotation marks around the entire field. |

## DS6000 remote support and notification commands

This section contains commands that are used to setup your system to enable remote support and notification. Remote support can include outbound support (call home) or inbound support (remote service that is performed by an IBM service representative).

Use the following commands to configure settings for remote support for the DS6000:

- **setplex**
- **showplex**
- **setdialhome**
- **setsmtp**
- **setsnmp**
- **setsim**
- **setcontactinfo**
- **showcontactinfo**
- **testcallhome**

The **setplex** command allows you to modify the 1750 storage complex settings. You can associate a unique name with the 1750, which allows you to open a secure shell connection to a storage unit for remote support.

The **showplex** command generates a report that displays the detailed properties of the specified 1750 storage complex. The report that is generated by this command also reflects the changes that you have made with the **setdialhome**, **setsim**, **setsmtp**, **setsnmp**, and **setplex** commands.

The **setdialhome** command activates the Call Home function.

The **setsmtp** command allows you to modify the storage image Simple Mail Transport Protocol (SMTP) and activate the e-mail notification settings.

The **setsnmp** command activates the Simple Network Management Protocol (SNMP) trap notification feature, which sends notifications using SNMP when a problem occurs on a storage unit.

The **setsim** command activates the SIM notification feature for zSeries hosts. A SIM is a service information message that contains data storage and data retrieval errors.

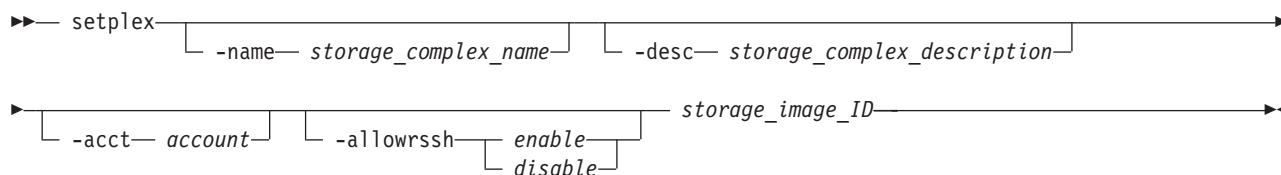
The **setcontactinfo** command allows you to supply contact information for your storage system administrator. When you use any of the remote support features, this information is sent to IBM so that an IBM service representative can contact you.

The **showcontactinfo** command generates a report that displays customer contact information for the storage complex.

The **testcallhome** command initiates a call home test by creating a test problem record.

## setplex

The **setplex** command allows you to modify the 1750 storage complex settings. You can associate a unique name with the 1750 which allows you to open a secure shell connection to a storage unit for remote support.



## Parameters

**Note:** You can view the changes of a processed **setplex** command by issuing the **showplex** command.

- name** *storage\_complex\_name*  
(Optional) Specifies the user-defined name for the storage complex.
- desc** *storage\_complex\_description*  
(Optional) Specifies the user-defined description for the storage complex.
- acct** *account*  
(Optional) Specifies the user-defined account number.
- allowrssh** *enable | disable*  
(Optional) Specifies that a secure shell connection to the storage unit be opened.

*storage\_image\_ID*  
(Required) Specifies the storage image ID. A storage image ID consists of the values associated with the manufacturer, machine type, and serial number.

## Example

### Invoking the setplex command

```
dscli>setplex -name primary_1750 -desc "Production volumes"
 -acct "IBM Storage" -allowrssh enable IBM.1750-68FA120
```

### The resulting output

Storage Plex *primary\_1750* successfully modified

## showplex

The **showplex** DS6000 command displays detailed properties of a 1750 storage complex. Detailed properties include your names, descriptions, and notification settings for the storage complex.

➤— showplex — storage\_image\_ID —➤  
" \_ "

### Parameters

**Note:** The **showplex** command displays the current settings for the parameters that are associated with the **setplex**, **setdialhome**, **setsim**, **setsmtp**, and **setsnmp** commands. Issue the **showplex** command after you have processed each of these commands so that you can view that your changes have been activated in your system.

*storage\_image\_ID* | -  
(Required) Specifies the storage image ID. A storage image ID consists of the values for manufacturer, machine type, and serial numbers.  
  
If you specify the dash (-), this parameter information is automatically supplied.

### Example

For this command and all other DS CLI show commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

#### Invoking the showplex command

dscli>showplex IBM.1750-68FA120

#### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120

| Name           | Desc              | Acct        | Allow-rssh | Dial-home | SNMP     | SNMP-info        | SNMP-comname   |
|----------------|-------------------|-------------|------------|-----------|----------|------------------|----------------|
| storage unit 1 | My storage unit 1 | ABC Company | Disabled   | Disabled  | Disabled | 9.11.123.123:500 | SNMP community |

| SMTP-server      | SIM DASD-level | SIM-DASD-notify | SIM-media-level | SIM-media-notify | SIMsu-level | SIMsu-notify | eMail-notify | Dial-home-modem |
|------------------|----------------|-----------------|-----------------|------------------|-------------|--------------|--------------|-----------------|
| 9.11.123.123:300 | None           | 1               | None            | 1                | None        | 1            | Enabled      | Enabled         |

### Report field definitions

**Name** Specifies the name that you have assigned to the designated storage unit.

**Desc** Specifies the description that you have assigned to the designated storage unit.

**Acct** Specifies the account name that you have assigned to the designated storage unit.

**Allowrssh**  
Specifies whether you can open access to the remote support shell connection (RSSH) to the designated storage unit.

**Dialhome**  
Specifies, if enabled, that the action to call home is activated when a problem is encountered.

**SNMP**  
Specifies whether you want the SNMP traps that are generated by the storage-complex to be sent to the IP address that you have designated with the **setsnmp** command.

**SNMPinfo**  
Specifies the SNMP IP address and port information where SNMP alerts are sent. The IP address and port information are separated with a colon. Multiple IP address and port pairs are separated with commas and no space before or after each comma.

**SNMPcomname**  
Specifies the SNMP community name. An SNMP community is the group that devices and management stations that run SNMP belong to. An SNMP community helps define where information is sent. The community name identifies the group, and an SNMP device or agent can belong to more than one SNMP community. SNMP does not respond to requests from management stations that do not belong to one of its communities. There are two SNMP default communities:

- Write = private
- Read = public

**SMTPserver**  
Specifies the SMTP IP address and port.

**SIMDASDlevel**  
Specifies the service information message (SIM) reporting level for DASD SIMs. One of the following values is displayed:

**acute** Indicates an irrecoverable error with possible loss of data.

**serious**  
Indicates an irrecoverable error or a data check with loss of access to data.

**moderate**  
Indicates that a system path is not operational and performance might be degraded.

**service**  
Indicates a recoverable error, equipment checks, or data checks. You can defer repair.

**none** Indicates that there are no problems.

**SIMDASDnotify**  
Specifies the maximum number of DASD service information messages that are sent after the first message.

### **SIMMedialevel**

Specifies the SIM reporting level for media SIMs. One of the following values is displayed:

**acute** Does not apply SIM media.

**serious**

Indicates an irrecoverable error or a data check with loss of access to data.

**moderate**

Does not apply to SIM media.

**service**

Indicates a recoverable error, equipment checks, or data checks. You can defer repair.

**none** Indicates that there are no problems.

### **SIMMedianotify**

Specifies the maximum number of media service information messages that are sent after the first message.

### **SIMsulevel**

Specifies the SIM reporting level for storage unit SIMs. One of the following values is displayed:

**acute** Does not apply SIM storage unit level.

**serious**

Indicates an irrecoverable error or a data check with loss of access to data.

**moderate**

Indicates that a system path is not operational and performance might be degraded.

**service**

Indicates a recoverable error, equipment checks, or data checks. You can defer repair.

**none** Indicates that there are no problems.

### **SIMsunotify**

Specifies the maximum number of additional storage unit service information messages that are sent after the first message.

### **eMailnotify**

Specifies, if enabled, that when service is required problem notifications be sent to an e-mail address that is specified by the **-contactemail** parameter of the **setcontactinfo** command.

### **Dialhomemodem**

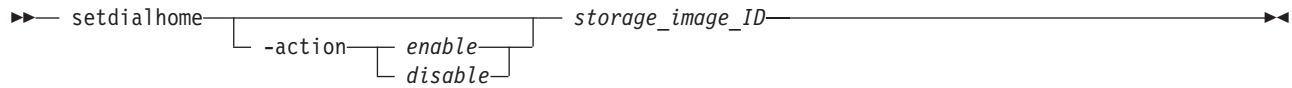
Specifies that an IP connection is available that allows the use of a modem in the Call Home support program.

**Note:** You cannot use the DS CLI to configure the modem or to test modem availability and connection. Use the DS Storage Manager to establish these settings.



## setdialhome

The **setdialhome** command activates the Call Home feature.



### Parameters

#### Notes:

1. The **setdialhome** command is not associated with the modem Call Home feature. DS CLI cannot be used to configure the modem or test modem availability and connection.
2. Before using the **setdialhome** command, you must ensure the following:
  - The **setsmtp** command must be enabled.
  - The required contact information must be set in place through the use of the **setcontactinfo** command. This information consists of the following:
    - Company name
    - Country
    - State or province
    - Primary contact phone number
3. You can view the changes of a processed **setdialhome** command by issuing the **showplex** command.

**-action** *enable | disable*

(Optional) Enables or disables the Call Home feature.

*storage\_image\_ID*

(Required) Specifies the storage image ID. A storage image ID consists of the values associated with the manufacturer, machine type, and serial number.

### Example

#### Invoking the setdialhome command

```
dscli>setdialhome -action enabled
IBM.1750-68FA120
```

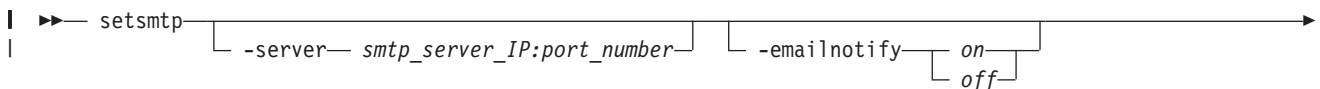
#### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

The dial home settings were successfully modified

## setsmtp

The **setsmtp** DS6000 command modifies the storage image Simple Mail Transport Protocol (SMTP) and activates the e-mail notification settings.



| ▶ *storage\_image\_ID* —————▶

|

|

## Parameters

|

**Note:** You can view the changes of a processed **setsmtp** command by issuing the **showplex** command.

|

|

**-server** *smtp\_server\_IP:port\_number* . . .

(Optional) Specifies the SMTP port and IP address where a message is sent in the event of a problem. You must separate the IP address and the port with a colon. Do not include blank spaces.

Example: 9.11.242.56:500

|

**-emailnotify** *on* | *off*

|

(Optional) Specifies that an e-mail notification be sent to the e-mail address that is specified by the **setcontactinfo** command with the **-contactemail** parameter.

|

|

**Note:** Before you process the **setsmtp** command with this parameter, run the **showcontactinfo** command to ensure that a contact e-mail address has been defined. If a contact e-mail address has not been defined, process the **setcontactinfo** command with the **-contactemail** parameter to allow you to receive notifications.

|

|

*storage\_image\_ID*

(Required) Specifies the storage image ID. A storage image ID consists of the values associated with the manufacturer, machine type, and serial number.

## Example

### Invoking the setsmtp command

```
dscli>setsmtp -server 9.11.242.12:500 IBM.1750-68FA120
```

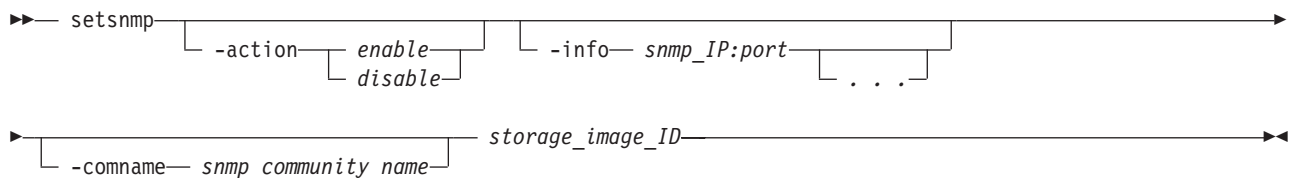
### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

The SMTP settings were successfully modified

## setsnmp

The **setsnmp** command activates the Simple Network Management Protocol (SNMP) trap notification feature, which sends notifications using SNMP when a problem occurs on a storage unit. Use the command to set the SNMP addresses for the notifications. This command is only used with the DS6000.



Parameters

**Note:** You can view the changes of a processed **setsnmp** command by issuing the **showplex** command.

- action** *enable | disable*  
(Optional) Enables or disables the SNMP notification feature.
- info** *snmp\_IP:port . . .*  
(Optional) Specifies the SNMP port and IP address where a message is sent in the event of a problem. You must separate the IP address and the port with a colon. Multiple SNMP IP addresses and port pairs must be separated with commas. Do not include white spaces.  
  
Example: 9.11.242.56:500,9.11.242.79:501
- comname** *snmp\_community\_name*  
(Optional) Specifies the SNMP community name.
- storage\_image\_ID**  
(Required) Specifies the storage image ID. A storage image ID consists of the values associated with the manufacturer, machine type, and serial number.

Example

Invoking the setsnmp command

dscli>setsnmp -info 9.11.242.7:161 IBM.1750-68FA120

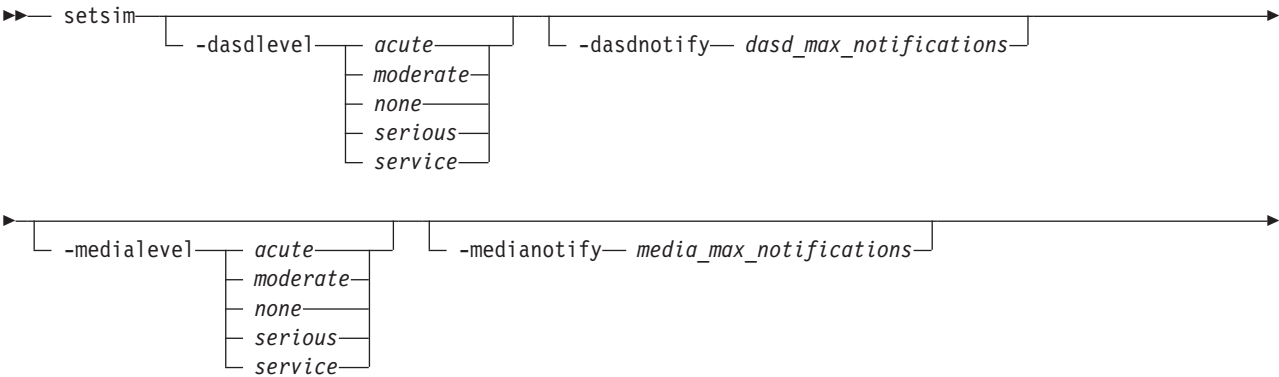
The resulting output

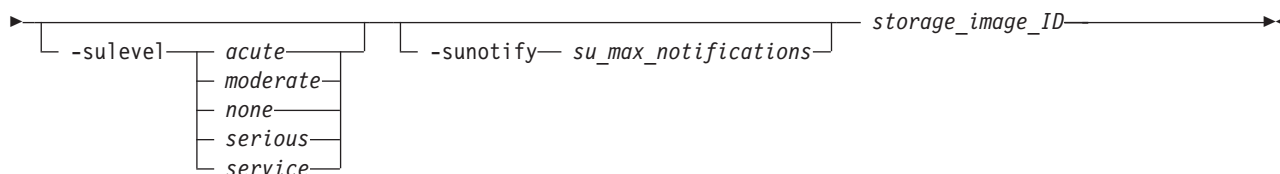
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120

The SNMP settings were successfully modified

setsim

On zSeries hosts, data storage and data retrieval errors are recorded and can be offloaded. A service information message (SIM) provides the error information. The **setsim** command activates the SIM notification feature.





## Parameters

**Note:** You can view the changes of a processed **setsim** command by issuing the **showplex** command.

**-dasdlevel** *acute | moderate | none | serious | service*

(Optional) Specifies the reporting level for DASD service information messages.

**-dasdnotify** *dasd\_max\_notifications*

(Optional) Specifies the maximum number of times that service information messages are offloaded for DASD service information messages. You can enter 0 to 5.

**-medialevel** *acute | moderate | none | serious | service*

(Optional) Specifies the reporting level for media service information messages.

**-medianotify** *media\_max\_notifications*

(Optional) Specifies the maximum number of times that service information messages are offloaded for media service information messages. You can enter 0 to 5.

**-sulevel** *acute | moderate | none | serious | service*

(Optional) Specifies the reporting level for storage unit service information messages.

**-sunotify** *dasd\_max\_notifications*

(Optional) Specifies the maximum number of times that service information messages are offloaded for storage unit service information messages. You can enter 0 to 5.

*storage\_image\_ID*

(Required) Specifies the storage image ID. A storage image ID consists of the values associated with the manufacturer, machine type, and serial number.

## Example

### Invoking the setsim command

```
dscli>setsim -dasdnotify 3 IBM.1750-68FA120
```

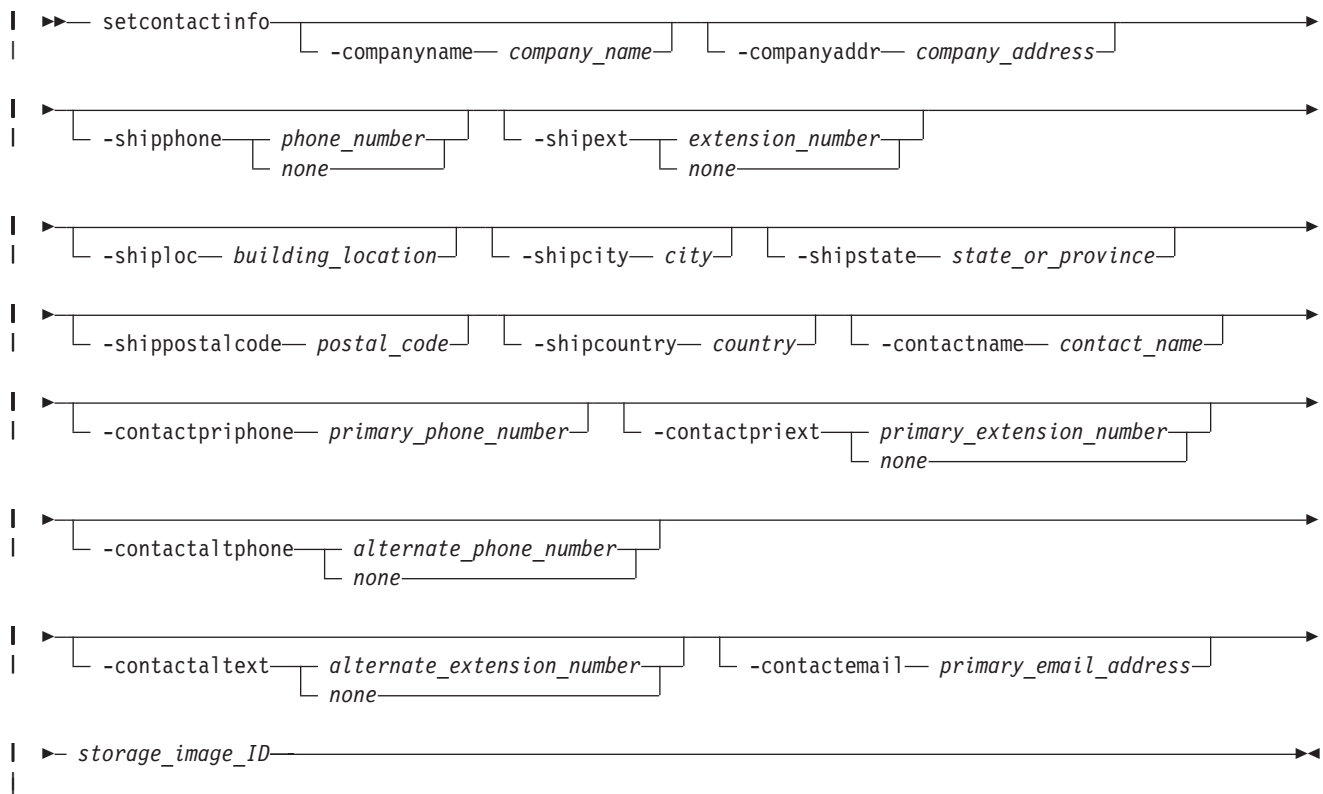
### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

The SIM settings were successfully modified

## setcontactinfo

The **setcontactinfo** DS6000 command provides contact information for your storage system administrator. When you use any of the remote support features, this information is sent to IBM so that an IBM service representative can contact you.



## Parameters

**-companyname** *company\_name*

(Required, if it is not currently set) Specifies your company name. This parameter is required only if the information has not previously been designated.

**-companyaddr** *company\_address*

(Optional) Specifies the address of the company. Enclose the address in double quotation marks.

Example "9000 S. Rita Rd Tucson AZ 85744"

**-shipphone** *phone\_number* | *none*

(Optional) Specifies the telephone number to contact regarding the equipment parts that are being shipped.

You can enter a country code, an area code, and a telephone number. Separate each code of the telephone number with a hyphen (for example, 520-555-5555).

### Notes:

1. The phone number can be no more than 22 characters.
2. Specify **-shipphone none** if you want to delete the ship phone contact number. When you specify **-shipphone none**, the ship phone number and the ship phone contact extension number is set to zero.
3. If you want to change the ship phone contact number, enter a new number for the command. The new number overrides what is there currently. This does not change the ship phone contact extension number. You must specify that separately.

For example, your current ship phone contact number and extension is 520-555-5555 4398 and you want to change it to 520-888-8888 2411. Enter the DS CLI **setcontactinfo** command as follows:

```
dsccli>setcontactinfo -shipphone 520-888-8888 -shipext
2411 IBM.1750-68FA120
```

**-shipext** *extension\_number* | *none*

(Optional) Specifies the extension number of the ship phone contact number.

**Notes:**

1. The extension number can be no more than 6 characters.
2. Specify **-shipext none** when you want to delete the extension number.
3. Specify **-shipext** and the extension number when you want to override an existing extension number.
4. You cannot specify the extension number by itself. There must be an entry for the ship phone contact number.

**-shiploc** *building\_location*

(Required, if it is not currently set) Specifies the building location where your equipment parts are generally shipped. Enclose the location in double quotation marks. This parameter is required only if the information has not previously been designated.

**-shipcity** *city*

(Optional) Specifies the city where your equipment parts are generally shipped.

Example: Tucson

**-shipstate** *state\_or\_province*

(Required, if it is not currently set) Specifies the state or province where your equipment parts are generally shipped. This parameter is required only if the information has not previously been designated.

Example: Arizona

**-shippostalcode** *postal\_code*

(Optional) Specifies the zip or postal code that is associated with the state or province where your equipment parts are shipped.

**-shipcountry** *country*

(Required, if it is not currently set) Specifies the country or region where your equipment parts are shipped. This parameter is required only if the information has not previously been designated. Table 2 on page 506 provides a list of the ISO country or region codes that you can use. This field also directs the Call Home e-mail records to the appropriate e-mail receiver for the geography of the machine.

**-contactname** *contact\_name*

(Optional) Specifies the name of the storage system administrator who can be contacted by IBM service personnel.

**-contactpriphone** *primary\_phone\_number*

(Required, if it is not currently set) Specifies the primary telephone number for IBM service personnel to use to contact the storage system administrator.

You can enter a country or region code, an area code, and a telephone number. Separate each code of the telephone number with a hyphen (for example, 520-555-5555).

**Notes:**

1. The phone number, including the country code, cannot be more than 22 characters.
2. An account cannot exist without a primary contact phone number. This number can never be set to zero.
3. Specify the **-contactpriphone** parameter and the new phone number to change the existing primary phone contact number. The new number overrides the existing number.

**-contactprixt** *extension\_number* | *none*

(Optional) Specifies the extension number of the primary contact phone number.

**Notes:**

1. The extension number can be no more than 6 characters.
2. Specify **-contactprixt none** when you want to delete the extension number.
3. Specify **-contactprixt** and the extension number when you want to override an existing extension number.
4. You cannot specify the extension number by itself. There must be an entry for the primary contact phone number.

**-contactaltphone** *alternate\_phone\_number* | *none*

(Optional) Specifies an alternate telephone number for IBM service personnel to use to contact the storage system administrator.

You can enter a country or region code, an area code, and a telephone number. Separate each code of the telephone number with a hyphen (for example, 520-555-4444).

**Notes:**

1. The phone number can be no more than 22 characters.
2. Specify **-contactaltphone none** if you want to delete the alternate phone contact number. When you specify **-contactaltphone none**, the alternate phone number and the alternate phone contact extension number is set to zero.
3. If you want to change the alternate phone contact number, enter a new number for the command. The new number overrides the number that is currently there. This does not change the alternate phone contact extension number. You must specify that separately. For example, your current ship phone contact number and extension is 520-555-5555 4398 and you want to change it to 520-888-8888 2411. Enter the DS CLI **setcontactinfo** command as follows:

```
dsccli>setcontactinfo -contactaltphone 520-888-8888 -contactalttext
2411 IBM.1750-68FA120
```

**-contactalttext** *extension\_number* | *none*

(Optional) Specifies the extension number of the alternate contact phone number.

#### Notes:

1. The extension number can be no more than 6 characters.
2. Specify **-contactalttext none** when you want to delete the extension number.
3. Specify **-contactalttext** and the extension number when you want to override an existing extension number.
4. You cannot specify the extension number by itself. There must be an entry for the alternate contact phone number.

#### **-contactemail** *primary\_email\_address*

(Optional) Specifies the e-mail address for IBM service personnel to use to contact the storage system administrator. This e-mail address is also used when you activate the system problem notification program.

#### Notes:

1. This parameter is required if you intend to use the Call Home function.
2. This parameter is required if you intend to designate the **-emailnotify** parameter of the **setsmtp** command.

#### *storage\_image\_ID*

(Required) This parameter accepts a fully qualified storage image ID. A storage image ID consists of the manufacturer, machine type, and serial number.

## Example

### Invoking the **setcontactinfo** command

```
dscli>setcontactinfo -companyname IBM -shipstate AZ -shiploc "bldg1300"
-shipcountry US -contactpriphone 520-799-8001 IBM.1750-68FA120
```

### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

The contact information settings were successfully modified

Table 2. Country and Region Codes

| ISO Country or Region Code | Business Unit | Country or Region Name | State |
|----------------------------|---------------|------------------------|-------|
| AF                         | EMA           | Afghanistan            |       |
| AL                         | EMA           | Albania                |       |
| DZ                         | EMA           | Algeria                |       |
| AS                         | APS           | American Samoa         |       |
| AD                         | EMA           | Andorra                |       |
| AO                         | EMA           | Angola                 |       |
| AI                         | LAG           | Anguilla               |       |
| AQ                         | LAG           | Antarctica             |       |
| AG                         | LAG           | Antigua and Barbuda    |       |
| AR                         | LAG           | Argentina              |       |
| AM                         | EMA           | Armenia                |       |
| AW                         | LAG           | Aruba                  |       |



Table 2. Country and Region Codes (continued)

| ISO Country or Region Code | Business Unit | Country or Region Name | State |
|----------------------------|---------------|------------------------|-------|
| AU                         | APS           | Australia              |       |
| AT                         | EMA           | Austria                |       |
| AZ                         | EMA           | Azerbaijan             |       |
| BS                         | LAG           | Bahamas                |       |
| BH                         | EMA           | Bahrain                |       |
| BD                         | APS           | Bangladesh             |       |
| BB                         | LAG           | Barbados               |       |
| BY                         | EMA           | Belarus                |       |
| BE                         | EMA           | Belgium                |       |
| BZ                         | LAG           | Belize                 |       |
| BJ                         | EMA           | Benin                  |       |
| BM                         | LAG           | Bermuda                |       |
| BT                         | APS           | Bhutan                 |       |
| BO                         | LAG           | Bolivia                |       |
| BA                         | EMA           | Bosnia and Herzegovina |       |
| BW                         | EMA           | Botswana               |       |
| BV                         | APS           | Bouvet Island          |       |
| BR                         | LAG           | Brazil                 |       |
| IO                         | APS           | British Indian Ocean   |       |
| BN                         | APS           | Brunei Darussalam      |       |
| BG                         | EMA           | Bulgaria               |       |
| BF                         | EMA           | Burkina Faso           |       |
| BI                         | APS           | Burundi                |       |
| KH                         | APS           | Cambodia               |       |
| CM                         | EMA           | Cameroon               |       |
| CA                         | CAN           | Alberta                | AB    |
| CA                         | CAN           | British Columbia       | BC    |
| CA                         | CAN           | Manitoba               | MB    |
| CA                         | CAN           | New Brunswick          | NB    |
| CA                         | CAN           | Newfoundland           | NL    |
| CA                         | CAN           | Nova Scotia            | NS    |
| CA                         | CAN           | Northwest Territorie   | NT    |
| CA                         | CAN           | Nunavut                | NU    |
| CA                         | CAN           | Ontario                | ON    |
| CA                         | CAN           | Prince Edward Island   | PE    |
| CA                         | CAN           | Quebec                 | QC    |
| CA                         | CAN           | Saskatchewan           | SK    |
| CA                         | CAN           | Yukon                  | YT    |
| CV                         | EMA           | Cape Verde             |       |

Table 2. Country and Region Codes (continued)

| ISO Country or Region Code | Business Unit | Country or Region Name      | State |
|----------------------------|---------------|-----------------------------|-------|
| KY                         | LAG           | Cayman Islands              |       |
| CF                         | EMA           | Central African Republic    |       |
| TD                         | EMA           | Chad                        |       |
| CL                         | LAG           | Chile                       |       |
| CN                         | APN           | China/Hong Kong             |       |
| CX                         | APS           | Christmas Islands           |       |
| CC                         | APS           | Cocos (Keeling) Island      |       |
| CO                         | LAG           | Colombia                    |       |
| KM                         | APS           | Comoros                     |       |
| CD                         | EMA           | Congo Democratic Republic   |       |
| CG                         | EME           | Congo Peoples Republic      |       |
| CK                         | APS           | Cook Islands                |       |
| CR                         | LAG           | Costa Rica                  |       |
| CI                         | EMA           | Cote d'Ivoire (Ivory        |       |
| HR                         | EMA           | Croatia                     |       |
| CU                         | LAG           | Cuba                        |       |
| CY                         | EMA           | Cyprus                      |       |
| CZ                         | EMA           | Czech Republic              |       |
| DK                         | EMA           | Denmark                     |       |
| DJ                         | EMA           | Djibouti                    |       |
| DM                         | LAG           | Dominica                    |       |
| DO                         | LAG           | Dominican Republic          |       |
| EC                         | LAG           | Ecuador                     |       |
| EG                         | EMA           | Egypt                       |       |
| SV                         | LAG           | El Salvador                 |       |
| GQ                         | EMA           | Equatorial Guinea           |       |
| ER                         | EMA           | Eritrea                     |       |
| EE                         | EMA           | Estonia                     |       |
| ET                         | EMA           | Ethiopia                    |       |
| FK                         | APS           | Falkland Islands (Malvinas) |       |
| FO                         | EMA           | Faroe Islands               |       |
| FJ                         | APS           | Fiji                        |       |
| FI                         | EMA           | Finland                     |       |
| FR                         | EMA           | France                      |       |
| GF                         | LAG           | French Guiana               |       |
| PF                         | APS           | French Polynesia            |       |
| TF                         | APS           | French Southern Territories |       |
| GA                         | EMA           | Gabon                       |       |
| GM                         | EMA           | Gambia                      |       |

Table 2. Country and Region Codes (continued)

| ISO Country or Region Code | Business Unit | Country or Region Name                | State |
|----------------------------|---------------|---------------------------------------|-------|
| GE                         | EMA           | Georgia                               |       |
| DE                         | EMA           | Germany                               |       |
| GH                         | EMA           | Ghana                                 |       |
| GI                         | EMA           | Gibraltar                             |       |
| GR                         | EMA           | Greece                                |       |
| GL                         | EMA           | Greenland                             |       |
| GD                         | LAG           | Grenada                               |       |
| GP                         | LAG           | Guadeloupe                            |       |
| GU                         | APS           | Guam                                  |       |
| GT                         | LAG           | Guatemala                             |       |
| GN                         | EMA           | Guinea                                |       |
| GW                         | APS           | Guinea-Bissau                         |       |
| GY                         | LAG           | Guyana                                |       |
| HT                         | LAG           | Haiti                                 |       |
| HM                         | APS           | Heard Island and McDonald Islands     |       |
| VA                         | EMA           | Holy See (Vatican City State)         |       |
| HN                         | LAG           | Honduras                              |       |
| HK                         | APN           | Hong Kong                             |       |
| HU                         | EMA           | Hungary                               |       |
| IS                         | EMA           | Iceland                               |       |
| IN                         | APS           | India                                 |       |
| ID                         | APS           | Indonesia                             |       |
| IR                         | EMA           | Iran (Islamic Republic of)            |       |
| IQ                         | EMA           | Iraq                                  |       |
| IE                         | EMA           | Ireland                               |       |
| IL                         | EMA           | Israel                                |       |
| IT                         | EMA           | Italy                                 |       |
| JM                         | LAG           | Jamaica                               |       |
| JP                         | APN           | Japan                                 |       |
| JO                         | EMA           | Jordan                                |       |
| KZ                         | EMA           | Kazakhstan                            |       |
| KE                         | EMA           | Kenya                                 |       |
| KI                         | EMA           | Kiribati                              |       |
| KP                         | APN           | Korea Democratic People's Republic of |       |
| KR                         | APN           | Korea Republic of                     |       |
| KW                         | EMA           | Kuwait                                |       |
| KG                         | EMA           | Kyrgyzstan                            |       |
| LA                         | APN           | Lao People's Democratic Republic      |       |
| LV                         | EMA           | Latvia                                |       |

Table 2. Country and Region Codes (continued)

| ISO Country or Region Code | Business Unit | Country or Region Name                | State |
|----------------------------|---------------|---------------------------------------|-------|
| LB                         | EMA           | Lebanon                               |       |
| LS                         | EMA           | Lesotho                               |       |
| LR                         | EMA           | Liberia                               |       |
| LY                         | EMA           | Libyan Arab Jamahiriya                |       |
| LI                         | EMA           | Liechtenstein                         |       |
| LT                         | EMA           | Lithuania                             |       |
| LU                         | EMA           | Luxembourg                            |       |
| MO                         | APS           | Macau                                 |       |
| MK                         | EMA           | Macedonia Former Yugoslav Republic of |       |
| MG                         | APS           | Madagascar                            |       |
| MW                         | EMA           | Malawi                                |       |
| MY                         | APS           | Malaysia                              |       |
| MV                         | APS           | Maldives                              |       |
| ML                         | EMA           | Mali                                  |       |
| MT                         | EMA           | Malta                                 |       |
| MH                         | APS           | Marshall Islands                      |       |
| MQ                         | LAG           | Martinique                            |       |
| MR                         | EMA           | Mauritania                            |       |
| MU                         | LAG           | Mauritius                             |       |
| YT                         | APS           | Mayotte                               |       |
| MX                         | LAG           | Mexico                                |       |
| FM                         | APS           | Micronesia Federated States of        |       |
| MD                         | EMA           | Moldava Republic of                   |       |
| MC                         | EMA           | Monaco                                |       |
| MN                         | APN           | Mongolia                              |       |
| MS                         | EMA           | Montserrat                            |       |
| MA                         | EMA           | Morocco                               |       |
| MZ                         | EMA           | Mozambique                            |       |
| MM                         | APS           | Myanmar                               |       |
| NA                         | EMA           | Namibia                               |       |
| NR                         | APS           | Nauru                                 |       |
| NP                         | APS           | Nepal                                 |       |
| NL                         | EMA           | Netherlands                           |       |
| AN                         | LAG           | Netherlands Antilles                  |       |
| NC                         | APS           | New Caledonia                         |       |
| NZ                         | APS           | New Zealand                           |       |
| NI                         | LAG           | Nicaragua                             |       |
| NE                         | EMA           | Niger                                 |       |
| NG                         | EMA           | Nigeria                               |       |

Table 2. Country and Region Codes (continued)

| ISO Country or Region Code | Business Unit | Country or Region Name                         | State |
|----------------------------|---------------|------------------------------------------------|-------|
| NU                         | EMA           | Niue                                           |       |
| NF                         | EMA           | Norfolk Island                                 |       |
| MP                         | APS           | Northern Mariana Island                        |       |
| NO                         | EMA           | Norway                                         |       |
| OM                         | EMA           | Oman                                           |       |
| PK                         | EMA           | Pakistan                                       |       |
| PW                         | APS           | Palau                                          |       |
| PS                         | EMA           | Palestinian Territory                          |       |
| PA                         | LAG           | Panama                                         |       |
| PG                         | EMA           | Papua New Guinea                               |       |
| PY                         | LAG           | Paraguay                                       |       |
| PE                         | LAG           | Peru                                           |       |
| PH                         | APS           | Philippines                                    |       |
| PN                         | APS           | Pitcairn                                       |       |
| PL                         | EMA           | Poland                                         |       |
| PT                         | EMA           | Portugal                                       |       |
| PR                         | DOM           | Puerto Rico                                    |       |
| QA                         | EMA           | Qatar                                          |       |
| RE                         | EMA           | Reunion                                        |       |
| RO                         | EMA           | Romania                                        |       |
| RU                         | EMA           | Russian Federation                             |       |
| RW                         | EMA           | Rwanda                                         |       |
| SH                         | EMA           | Saint Helena                                   |       |
| KN                         | LAG           | Saint Kitts and Nevis                          |       |
| LC                         | APS           | Saint Lucia                                    |       |
| PM                         | LAG           | Staint Pierre and Miquelon                     |       |
| VC                         | LAG           | Saint Vincent and the Grenadines               |       |
| WS                         | APS           | Samoa                                          |       |
| SM                         | EMA           | San Marino                                     |       |
| ST                         | APS           | Sao Tome and Principle, Democratic Republic of |       |
| SA                         | EMA           | Saudi Arabia                                   |       |
| SN                         | EMA           | Senegal                                        |       |
| CS                         | EMA           | Serbia and Nontenegro                          |       |
| SC                         | EMA           | Seychelles                                     |       |
| SL                         | EMA           | Sierra Leone                                   |       |
| SG                         | APS           | Singapore                                      |       |
| SK                         | EMA           | Slovakia                                       |       |
| SI                         | EMA           | Slovenia                                       |       |

Table 2. Country and Region Codes (continued)

| ISO Country or Region Code | Business Unit | Country or Region Name                       | State |
|----------------------------|---------------|----------------------------------------------|-------|
| SB                         | APS           | Solomon Islands                              |       |
| SO                         | EMA           | Somalia                                      |       |
| ZA                         | EMA           | South Africa                                 |       |
| GS                         | APS           | South Georgia and the South Sandwich Islands |       |
| ES                         | EMA           | Spain                                        |       |
| LK                         | APS           | Sri Lanka                                    |       |
| SD                         | EMA           | Sudan                                        |       |
| SR                         | APS           | Suriname                                     |       |
| SJ                         | EMA           | Svalbard and Jan Mayen Islands               |       |
| SZ                         | EMA           | Swaziland                                    |       |
| SE                         | EMA           | Sweden                                       |       |
| CH                         | EMA           | Switzerland                                  |       |
| SY                         | EMA           | Syrian Arab Republic                         |       |
| TW                         | APS           | Taiwan                                       |       |
| TJ                         | EMA           | Tajikistan                                   |       |
| TZ                         | EMA           | Tanzania United Republic of                  |       |
| TH                         | APS           | Thailand                                     |       |
| TL                         | EMA           | Timor-Leste (East Timor)                     |       |
| TG                         | EMA           | Togo                                         |       |
| TK                         | APS           | Tokelau                                      |       |
| TO                         | APS           | Tonga                                        |       |
| TT                         | LAG           | Trinidad and Tobago, Republic of             |       |
| TN                         | EMA           | Tunisia                                      |       |
| TR                         | EMA           | Turkey                                       |       |
| TM                         | EMA           | Turkmenistan                                 |       |
| TC                         | APS           | Turks and Caicos Island                      |       |
| TV                         | APS           | Tuvalu                                       |       |
| UG                         | EMA           | Uganda                                       |       |
| UA                         | EMA           | Ukraine                                      |       |
| AE                         | EMA           | United Arab Emirates                         |       |
| GB                         | EMA           | United Kingdom                               |       |
| US                         | DOM           | Alaska                                       | AK    |
| US                         | DOM           | Alabama                                      | AL    |
| US                         | DOM           | Arkansas                                     | AR    |
| US                         | DOM           | Arizona                                      | AZ    |
| US                         | DOM           | California                                   | CA    |
| US                         | DOM           | Colorado                                     | CO    |
| US                         | DOM           | Connecticut                                  | CT    |

Table 2. Country and Region Codes (continued)

| ISO Country or Region Code | Business Unit | Country or Region Name | State |
|----------------------------|---------------|------------------------|-------|
| US                         | DOM           | District of Columbia   | DC    |
| US                         | DOM           | Delaware               | DE    |
| US                         | DOM           | Florida                | FL    |
| US                         | DOM           | Georgia                | GA    |
| US                         | DOM           | Hawaii                 | HI    |
| US                         | DOM           | Iowa                   | IA    |
| US                         | DOM           | Idaho                  | ID    |
| US                         | DOM           | Illinois               | IL    |
| US                         | DOM           | Indiana                | IN    |
| US                         | DOM           | Kansas                 | KS    |
| US                         | DOM           | Kentucky               | KY    |
| US                         | DOM           | Louisiana              | LA    |
| US                         | DOM           | Massachusetts          | MA    |
| US                         | DOM           | Maryland               | MD    |
| US                         | DOM           | Maine                  | ME    |
| US                         | DOM           | Michigan               | MI    |
| US                         | DOM           | Minnesota              | MN    |
| US                         | DOM           | Missouri               | MO    |
| US                         | DOM           | Mississippi            | MS    |
| US                         | DOM           | Montana                | MT    |
| US                         | DOM           | North Carolina         | NC    |
| US                         | DOM           | North Dakota           | ND    |
| US                         | DOM           | Nebraska               | NE    |
| US                         | DOM           | New Hampshire          | NH    |
| US                         | DOM           | New Jersey             | NJ    |
| US                         | DOM           | New Mexico             | NM    |
| US                         | DOM           | Nevada                 | NV    |
| US                         | DOM           | New York               | NY    |
| US                         | DOM           | Ohio                   | OH    |
| US                         | DOM           | Oklahoma               | OK    |
| US                         | DOM           | Oregon                 | OR    |
| US                         | DOM           | Pennsylvania           | PA    |
| US                         | DOM           | Puerto Rico            | PR    |
| US                         | DOM           | Rhode Island           | RI    |
| US                         | DOM           | South Carolina         | SC    |
| US                         | DOM           | South Dakota           | SD    |
| US                         | DOM           | Tennessee              | TN    |
| US                         | DOM           | Texas                  | TX    |
| US                         | DOM           | Utah                   | UT    |

Table 2. Country and Region Codes (continued)

| ISO Country or Region Code | Business Unit | Country or Region Name   | State |
|----------------------------|---------------|--------------------------|-------|
| US                         | DOM           | Virginia                 | VA    |
| US                         | DOM           | Vermont                  | VT    |
| US                         | DOM           | Washington               | WA    |
| US                         | DOM           | Wisconsin                | WI    |
| US                         | DOM           | West Virginia            | WV    |
| US                         | DOM           | Wyoming                  | WY    |
| UM                         | DOM           | United States Minor      |       |
| UY                         | LAG           | Uruguay                  |       |
| UZ                         | EMA           | Uzbekistan               |       |
| VU                         | APS           | Vanuatu                  |       |
| VE                         | LAG           | Venezuela                |       |
| VN                         | APS           | Viet Nam                 |       |
| VG                         | LAG           | Virgin Islands (British) |       |
| VI                         | LAG           | Virgin Islands (U.S.)    |       |
| WF                         | APS           | Wallis and Futuna Island |       |
| EH                         | EMA           | Western Sahara           |       |
| YE                         | EMA           | Yemen                    |       |
| ZM                         | EMA           | Zambia                   |       |
| ZW                         | EMA           | Zimbabwe                 |       |

## showcontactinfo

The **showcontactinfo** command displays customer contact information for the storage image.

►►— showcontactinfo— storage\_image\_ID—◄◄

## Parameters

storage\_image\_ID -

(Required) Accepts a fully qualified storage image ID. A storage image ID consists of manufacturer, machine type, and serial number.

## Example

### Invoking the showcontactinfo command

```
dscli>showcontactinfo IBM.1750-68FA120
```

### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
```

```
companyname IBM
companyaddr 9000 S. Rita Rd Tucson Az 85744
shipphone 1-520-7998001-
shiploc Lab 2000
```



```

shipcity Tucson
shipstate AZ
shippostalcode 85744
shipcountry US
contactname John Doe
contactpriphone 1-520-7998001-
contactaltphone 1-520-7998002-
contactemail johndoe@us.ibm.com

```

## testcallhome

The **testcallhome** DS6000 command initiates a call home test by creating a test problem record.

```

▶▶—testcallhome— storage_image_ID —————▶▶
 " _ "

```

### Parameters

**Note:** The Call Home function has a modem call home feature. The **testcallhome** command cannot be used to test the modem connection. You must use the DS Storage Manager to configure and test the modem call home feature.

*storage\_image\_ID* -

(Required) This parameter accepts a fully qualified storage image ID. A storage image ID consists of manufacturer, machine type, and serial number.

If you specify the dash (-), this parameter information is automatically supplied.

### Example

#### Invoking the testcallhome command

```
dscli>testcallhome IBM.1750-68FA120
```

#### The resulting output

```

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120

```

A test problem record was successfully created.

---

## DS6000 PE package commands

This section contains commands that are used to create and send information logs to IBM which are then used for problem analysis and resolution.

**Note:** The group of commands described in this section are not supported on a System i system.

Use the following commands to create, copy, and send PE packages for the DS6000:

- **lspe**
- **lsss**
- **mkpe**
- **offloadss**
- **sendpe**

- **sendss**

The **lspe** command generates a report that is used by a DS6000 user to find previously created PE package files that are ready to send to IBM.

The **lss** command generates a report that is used by a DS6000 user to find previously created offloaded statesave files that are ready to send to IBM.

The **mkpe** command creates and copies PE packages from DS6000 nodes to the destination directory on a management node. You must have administrator authority to use the **mkpe** command.

The **offloadss** command copies state information from nodes to the destination directory on a management node.

The **sendpe** command is used by a DS6000 user to send a previously created PE package to IBM. You must have administrator authority to use the **sendpe** command.

The **sendss** command is used by a DS6000 user to send previously created offloaded statesave files to IBM. You must have administrator authority to use the **sendss** command.

## offloadss

The **offloadss** DS6000 command copies state information from nodes to the destination directory on a management node.

```

>> offloadss [-noftp] [-retry count] storage_image_ID >>

```

## Parameters

### Notes:

1. This command can only be initiated from the DSCLI client installed locally on the management console connected to the target storage unit.
2. Only a person with administrator authority can initiate this command.
3. The statesave information is collected in the %MR1750\_SM\_HOME%\send2IBM directory and automatically sent to the IBM support Web address. As with the use of the **mkpe** command, the files that are sent by FTP transfer are automatically moved to the master console subdirectory %MR1750\_SM\_HOME%\send2IBM\sent\

### **-noftp**

(Optional) Specifies that the ftp transfer to IBM be disabled. The default is that ftp transfer is enabled unless this parameter is specified.

**Note:** You cannot use this parameter with the **-retry** parameter.

### **-retry count**

(Optional) Specifies the number of times that FTP can be tried after the original FTP transfer has failed. You can specify a value of 0 - 3 with 0 being the default. If you specify 0, no additional FTP transfers are attempted after the initial FTP transfer attempt.

**Note:** You cannot use this parameter with the **-noftp** parameter.

*storage\_unit\_ID*

(Required) Specifies the storage image ID. A storage image ID consists of manufacturer, machine type, and serial number.

## Example

### Invoking the offloadss command

```
dscli>offloadss IBM.1750685FA120
```

### The resulting output

```
Date/Time: Sun Jan 09 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120

offloadss: The following files offloaded from 1750-68FA120:
/Program Files/IBM/DS6000StorageManager/SM/send2IBM/
175051113AB15A.IBM.0.NOPMH.20050327243603.c10.dumptrace.tgz

offloadss: statesave FTPed to IBM:
175051113AB15A.IBM.0.NOPMH.20050327243603.c10.dumptrace.tgz

offloadss: successfully completed.
```

## mkpe

The **mkpe** command creates and copies PE packages from DS6000 nodes to the destination directory on a management node. The **mkpe** command is also used to create a PE package from the log and configuration files contained on the storage management console, and the package does not contain any files that are copied from the DS6000 nodes.

```
mkpe [-noftp] [-retry count] [-smonly]
[-customer customer_name] storage_image_ID
```

## Parameters

### Notes:

1. This command can only be initiated from the DSCLI client installed locally on the management console connected to the target storage unit.
2. You must have administrator authority to use the **mkpe** command.
3. The PE package information is collected on the MC in subdirectory %MR1750\_SM\_HOME%\send2IBM. You use the **mkpe** command to collect the information and create the PE package which is then transferred using FTP to the IBM support Web address.
4. PE package files that are successfully transferred to IBM support are automatically moved to the MC subdirectory, %MR1750\_SM\_HOME%\send2IBM\sent\.
5. When there is a transfer failure (after attempts to use FTP for the designated number of times), you can use the **sendpe** command to send the package file later.
6. The **mkpe** command is processed in the background on the storage server side. This processing can take more than an hour to complete. A message is displayed when the **mkpe** command is issued that indicates

a period of time might pass before the command processing is completed. If you specify the **-smonly** parameter in your command, no message is displayed.

**-noftp**

(Optional) Specifies that the FTP transfer to IBM be disabled. The default is that the FTP transfer is enabled until this parameter is specified. You can send the PE package later by using the **sendpe** command when you specify the **-noftp** parameter.

A typical use of this parameter is when your MC is located in a network that does not have direct access to the Internet or to IBM support. Another use for this parameter might be when you are experiencing connection problems with IBM. You can create the PE package and send it later using the **sendpe** command.

**Note:** You cannot use the **-noftp** parameter with the **-retry** parameter.

**-retry** *count*

(Optional) Specifies that the FTP transfer to IBM be retried (after the original attempt fails) up to a maximum of three times. The default value is zero (no additional transfer attempts after the initial failure).

**Note:** You cannot use the **-retry** parameter with the **-noftp** parameter.

**-smonly**

(Optional) Specifies that a PE package be created that includes copies of the log and configuration files that are contained only on the MC. There are no files that are copied from the DS6000 storage nodes for inclusion in this PE package.

**Note:** You must include the **-customer** parameter when you use the **-smonly** parameter.

**-customer** *customer\_name*

(Required when the **-smonly** parameter is specified) Specifies the customer name that is associated with the MC PE package. This name must be communicated to or received from IBM support because it is used to identify the PE package.

**Note:** The customer name can contain up to 15 alphanumeric or nonalphanumeric characters. The nonalphanumeric characters must be represented by an underscore. For example, if the original name is global2warm\*hot, it is represented as global2warm\_hot.

**Example of a completed MC only pe package file:**

```
1750511SMC0000.mine4results.000.NOPMH.051028223544.
c10.SMCLog.zip
```

**storage\_image\_ID**

(Required) Specifies the storage image ID. A storage image ID consists of the manufacturer, machine type, and serial numbers.

## Example

The following examples show how you might use the **mkpe** command in three different situations:

### Invoking the mkpe command to create, copy and send a PE package from DS6000 nodes to IBM support

```
dscli>mkpe IBM.1750-68FA120
```

#### The resulting output

```
Date/Time: Sun Jan 09 02:23:49 PST 2005 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
CMUC00246I mkpe: The task might take more than 1 hour to complete.
The following PE package successfully generated and copied
from 1750-68FA120:
c:/Program_Files/IBM/DS6000StorageManager/SM/send2IBM/175051113AB15A.
IBM.0.NOPMH.20050328223544.c10.pe.zip
c:/Program_Files/IBM/DS6000StorageManager/SM/send2IBM/175051113AB15A.
IBM.0.NOPMH.20050328223807.c11.pe.zip

PE package successfully sent to IBM:
175051113AB15A.IBM.0.NOPMH.20050328223544.c10.pe.zip

PE package successfully sent to IBM:
175051113AB15A.IBM.0.NOPMH.20050328223807.c11.pe.zip
```

mkpe successfully completed.

### Invoking the mkpe command to create and copy a PE package from DS6000 nodes to the management console.

```
dscli>mkpe -noftp IBM.1750-68FA120
```

#### The resulting output

```
Date/Time: Sun Jan 09 02:23:49 PST 2005 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
CMUC00246I mkpe: The task might take more than 1 hour to complete.
The following PE package successfully generated and copied from
1750-68FA120:

c:/Program_Files/IBM/DS6000StorageManager/SM/send2IBM/175051113AB15A.
IBM.0.NOPMH.20050328223544.c10.pe.zip
c:/Program_Files/IBM/DS6000StorageManager/SM/send2IBM/175051113AB15A.
IBM.0.NOPMH.20050328223807.c11.pe.zip
```

mkpe successfully completed.

### Invoking the mkpe command to create an MC PEpackage and send it to IBM with a retry count of 3:

```
dscli>mkpe -smconly
-customer mine4results -retry 3 IBM.1750-68FA120
```

#### The resulting output

```
Date/Time: Sun Jan 09 02:23:49 PST 2005 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA120
The following SMC PE package successfully generated:

c:/Program_Files/IBM/DS6000StorageManager/SM/send2IBM/1750511SMC0000.
mine4results.000.NOPMH.051028223544.c10.SMCLog.zip

PE package successfully sent to IBM:
1750511SMC0000.mine4results.000.NOPMH.051028223544.
c10.SMCLog.zip
```

mkpe successfully completed.

## sendss

The **sendss** command is used by a DS6000 user with administrator authority to send previously created offloaded statesave files to IBM. This might be necessary if there was an error during the original FTP of the statesave file.

```
►► sendss [-retry count] statesave_filename [. . .]
```

## Parameters

### Notes:

1. This command can only be initiated from the DSCLI client installed locally on the management console connected to the target storage unit.
2. Only DS6000 users who have administrator authority can use this command.
3. Use the **lss** command with the **-state ready** parameter to list the statesave files that you want to send to IBM.
4. After the files are sent to IBM, the copies on your system are automatically moved to the %MR1750\_SM\_HOME%\send2IBM\sent directory.

### **-retry** count

(Optional) Specifies the number of times you want the system to keep trying to send the files by FTP if an error occurred on the original FTP transaction. You can specify a value of 0 - 3. The default is 0 and indicates that FTP not make attempts to resend the files.

statesave\_name | ... | -

(Required) Specifies the file that is to be sent to IBM. A typical filename might look like the following:

175051113AB15A.IBM.0.NOPMH.050318180713.c10.dumptrace.tgz

## Example

### Invoking the sendss command

```
dscli>sendss
-retry 3 175051113AB15A.IBM.0.NOPMH.050318180713.c10.dumptrace.tgz
```

### The resulting output

```
sends: Statesave sent to IBM:
175051113AB15A.IBM.0.NOPMH.050318180713.c10.dumptrace.tgz
sendss: successfully completed.
```

## sendpe

The **sendpe** command is used by a DS6000 user with administrator authority to send a previously created PE package to IBM. This might be necessary because there was an error during the original FTP transfer of the package.

```
►► sendpe [-retry count] pepackage_name [. . .]
```

Parameters

Notes:

- 1. This command can only be initiated from the DSCLI client installed locally on the management console connected to the target storage unit.
- 2. Only DS6000 users who have administrator authority can use this command.
- 3. Use the **lspe** command with the **-state ready** parameter to list the PE package files that you want to send to IBM.
- 4. The PE package files that can be sent have a file extension of pe.zip or SMClog.zip.
- 5. After the files are sent to IBM, the copies on your system are automatically moved to the %MR1750\_SM\_HOME%\send2IBM\sent directory.

**-retry** *count*

(Optional) Specifies that the FTP transfer to IBM be retried (after the original attempt fails) up to a maximum of three times. The default value is zero (no additional transfer attempts after the initial failure).

*pepackage\_name* | ... | -

(Required) Specifies the file that is to be sent to IBM. A typical file name might look like the following:

175051113AB15A.IBM.0.NOPMH.20050328223544.c10.pe.zip

Example

Invoking the sendpe command

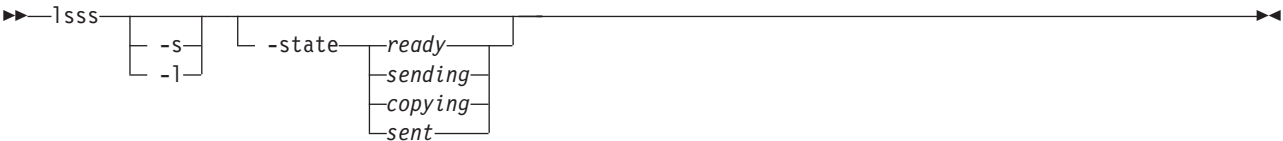
```
dscli>sendpe
-retry 3 175051113AB15A.IBM.0.NOPMH.20050328223544.c10.pe.zip
```

The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DSCLI Version: 5.0.0.0 DS:
IBM.1750-68FA120
PE package successfully sent to IBM:
175051113AB15A.IBM.0.NOPMH.20050328223544.c10.pe.zip
sendpe successfully completed.
```

lsss

The **lsss** command is used by a DS6000 user to find previously created offloaded statesave files that are ready to send to IBM. These files were created with the **offloadss** command and must be sent to IBM because there was an error during the original FTP transfer of the statesave file.



Parameters

**Note:** This command can only be initiated from the DSCLI client installed locally on the management console connected to the target storage unit.

**-s** (Optional) Specifies that only the statesave file names be displayed. You cannot use the **-l** and the **-s** parameters together.

**-l** (Optional) Specifies that the default output plus additional attributes that are identified as long output be displayed. You cannot use the **-l** and the **-s** parameters together.

**-state** *ready | sending | copying | sent*

(Optional) Specifies that the report displays statesave files that meet the designated criteria. For example, if you specify the **-state ready** parameter, the report returns only those statesave file names that are ready to be sent to IBM.

Each option (*ready*, *sending*, *copy*, and *sent*) that is associated with this parameter represents a specific status that you can designate to narrow the search criteria. The **lsss** command uses this criteria to search for statesave files. The following values are associated with each option:

**Ready** Specifies that you want to see the files that have been offloaded from the 1750, but not yet sent to IBM.

**Sending**

Specifies that the file is in the process of being transferred to IBM.

**Copying**

Specifies that the statesave file is in the process of being copied from either of the two storage management consoles.

**Sent** Specifies that the statesave file has been transferred to IBM.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

### Invoking the lsss command

```
dscli>lsss -l
-state ready
```

### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS:

| Statesave                                                                      | State | Lasttime                   | Size (KB) |
|--------------------------------------------------------------------------------|-------|----------------------------|-----------|
| 175051113<br>AB15A.IBM.<br>0.NOPMH.<br>050318180<br>713.cl0.dump-<br>trace.tgz | Ready | 10/23/2005<br>00:00:00 PST | 5000      |
| 175051113<br>AB15A.IBM.<br>0.NOPMH.<br>050318180<br>713.cl1.dump-<br>trace.tgz | Ready | 10/23/2005<br>00:00:10 PST | 5000      |

## Report field definitions

### Statesave

Specifies the name of the statesave file.



**State** Specifies the status that is associated with the statesave file.

**Lasttime**  
Specifies the last modified timestamp of the designated statesave file.

**Size (KB)**  
Specifies the size of the designated statesave file.

## lspe

The **lspe** command is used by a DS6000 user to find previously created PE package files that are ready to send to IBM. These files were created with the **mkpe** command and must be sent to IBM because there was an error during the original FTP of the PE package file.



## Parameters

**Note:** This command can only be initiated from the DSCLI client installed locally on the management console connected to the target storage unit.

- s** (Optional) Specifies that only the PE package file names be displayed. You cannot use the **-l** and the **-s** parameters together.
- l** (Optional) Specifies that the default output plus additional attributes that are identified as long output be displayed. You cannot use the **-l** and the **-s** parameters together.
- state ready | sending | copying | sent**  
(Optional) Specifies that the report display PE package files that meet the designated criteria. For example, if you specify the **-state ready** parameter, the report returns only those PE package file names that are ready to be sent to IBM.

Each option (ready, sending, copying, and sent) that is associated with this parameter represents a specific status that you can designate to narrow the search criteria. The **lspe** command uses this criteria when it searches for PE package files. The following values are associated with each option:

**Ready** Specifies that the PE package file was created but not yet sent to IBM.

### Sending

Specifies that the file is in the process of being transferred to IBM.

### Copying

Specifies that the PE package file is in the process of being copied from either of the two storage management consoles.

**Sent** Specifies that the PE package file has been transferred to IBM.

## Example

For this command and all other DS CLI list commands, the results are shown in table format to provide clarity. The actual reports do not display as tables.

## Invoking the lspe command

```
dscli>lspe -l
-state ready
```

### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS:

| PE Package                                                                        | State | Date                       | Size (KB) |
|-----------------------------------------------------------------------------------|-------|----------------------------|-----------|
| 175051113<br>AB15A.IBM.<br>0.NOPMH.<br>200503282<br>23544.<br>cl0.pe.zip          | Ready | 10/23/2005<br>00:00:00 PST | 800       |
| 1750511SMC<br>0000.tucson.<br>000.NOPMH.<br>20051023000<br>000.cl0.<br>SMCLog.zip | Ready | 10/23/2005<br>00:00:10 PST | 300       |

### Report field definitions

#### PE Package

Specifies the name of the PE package file.

#### State

Specifies the status associated with the PE package file.

#### Date

Specifies the last modified timestamp of the designated PE package file.

#### Size (KB)

Specifies the size of the designated PE package file.

---

## DS6000 problem log commands

This section contains commands that can track and close problems that might be encountered during the operation of your system. Problems are designated by type and include the following values: hardware, software, test, heartbeat and data loss.

Use the following commands to list the problem logs for the DS6000:

- **closeproblem**
- **lsproblem**

The **closeproblem** command removes the problem record from the storage unit.

The **lsproblem** command generates a report that lists which problems and a few of the details about the problem such as how often the problem has occurred or which component type has detected the problem.

### closeproblem

The **closeproblem** command modifies the status of a problem in the problem log file to closed.

```
➤➤ closeproblem [-dev storage_image_ID] [-quiet] --node node_Num problem_ID ➤➤
```

## Parameters

**Note:** You cannot specify a range of problem IDs.

**-dev** *storage\_image\_ID*

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for all ID values that take a storage image ID in the command input required for this command.

**-quiet**

(Optional) Specifies that the confirmation prompt for this command be turned off.

**-node** *node\_Num*

(Required) Specifies the ID of the node on which the problem record was created.

The node number, along with the problem ID uniquely identifies a problem record.

*problem\_ID*

(Required) Specifies the problem entry to be closed. The format of the problem ID is *yyyy-mm-dd-hh.mm.ss.us*

## Example

### Invoking the `closeproblem` command

```
dscli>closeproblem -dev IBM.1750-68FA121 -node 0 2005-01-01-12.30.00.000001
```

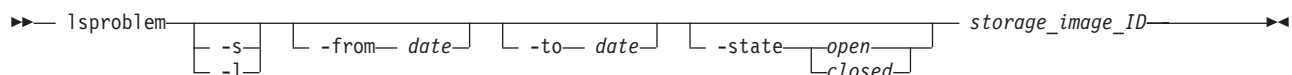
### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.1750-68FA121
```

```
Are you sure you want to close problem 2004-01-01-12.30.00.000001 ? y/n Y
Problem 2005-01-01-12.30.00 was successfully closed.
```

## lsproblem

The **lsproblem** command lists problem logs. This command is exclusive to the DS6000.



## Parameters

**-s** (Optional) Displays problem IDs. You cannot use the **-l** and the **-s** parameters together.

**-l** (Optional) Displays the default output and attributes that are identified as long output. You cannot use the **-l** and the **-s** parameters together.

**-from** *date*

(Optional) To print problem IDs for a range of dates, enter the start date (in the format of *mm/dd/yyyy*) for the range. For example, 06/11/2005.

**-to** *date*

(Optional) To print problem IDs for a range of dates, enter the end date (in the format of *mm/dd/yyyy*) for the range. For example, 08/24/2005.

**-state** *open* | *closed*

(Optional) The problem state that you want to print in the log.

**storage\_image\_ID**

(Required) Specifies a storage image ID. Accepts a fully qualified storage image ID. A storage image ID consists of manufacturer, machine type, and serial number.

## Example

The following tables represent the headers that are displayed on the output report associated with the **lsproblem** command using the **-l** parameter.

### Invoking the lsproblem command

```
dsccli>lsproblem -l IBM.1750-68FA120
```

### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0  
DS: IBM.1750-68FA120

| ID                        | Node | Type | Sev     | Occur | State |
|---------------------------|------|------|---------|-------|-------|
| 2004-02-12-01.23.45.66666 | 0    | H/W  | Problem | 1     | Open  |

| Frus | FruList | SRN      | First time                | Last time                 | Detector |
|------|---------|----------|---------------------------|---------------------------|----------|
| 1    |         | BE804900 | 2004-02-12-01.23.45.66666 | 2004-02-12-01.23.45.66666 | SES      |

### Report column definitions

**ID** Specifies the identification number that is assigned to the problem.

**Node** Specifies the node (0 or 1) on which the problem record is created. The node number, along with the Problem ID, uniquely identifies a problem record.

**Type** Specifies the type of problem. One of the following choices is displayed:

- H/W
- S/W
- Test
- Heartbeat
- Data Loss

**SEV** Specifies the severity of the problem. One of the following choices is displayed:

- Problem
- Event
- Attention
- Test
- Heartbeat

**Occur** Specifies the number of times that the problem occurs.

**State** Specifies the state of the problem as being open or closed.

**FRUs** Specifies the number of FRUs that are suspended for causing the problem.

**FRUList**

Specifies the list of FRUs that are candidates for replacement in order to solve the problem. This list also specifies the FRUs that have been replaced and identifies those that need to be replaced.

**SRN** Specifies the SRN (service reference number), also known as SRC, which is a 4-byte value.

**Firsttime**

Specifies the first timestamp of the problem.

**Lasttime**

Specifies the last timestamp of the problem.

**Detector**

Specifies the component type that found the problem. One of the following choices is displayed:

- Harvest
- RAS
- AH
- Bering
- SES



---

## Chapter 12. Removing the DS6000 command line interface

---

### Removing the DS CLI using unattended (silent) mode

Use the unattended (silent) mode to remove the DS CLI through the command line if the DS CLI is installed on a UNIX system or a variant of UNIX (for example, HPUX, Sun, or AIX).

Perform the following steps to successfully uninstall the DS CLI.

**Notes:**

1. If you are using Windows or Novell, you will use the Add/Remove Programs feature to uninstall the DS CLI.
2. This uninstall process only works with DS CLI. No other versions of CLI can be removed with this process.
1. Locate the uninstaller file in the `/_uninst` folder. If you selected the default directory, you can find the `_uninst` folder using the `/opt/ibm/dscli` path. The uninstaller file name is `uninstaller.xxx`, where `xxx` depends on the operating system. If you have a Hewlett Packard, Sun, or AIX system, then the file name is `uninstaller.bin`. For all other operating systems the file name is `uninstaller.sh`.
2. Type the following command at the command prompt: `<install directory>/_uninst/uninstaller.<exe | sh | bin> -silent`
3. Press the **Enter** key. All the associated CLI files are uninstalled.

---

### Removing the DS CLI using the console mode

Use the console mode to remove the DS CLI when the DS CLI is installed on a UNIX system that does not have use of an X display.

Perform the following steps to remove the DS CLI using the console mode:

**Note:** Do not use the console method to uninstall DS CLI on a Windows system. Instead, follow the steps in this guide for removing the DS CLI using graphical mode.

1. Type the following command at a command prompt: `<install directory>/_uninst/uninstaller.<sh | bin> -console`
2. The Welcome screen displays. Press 1 and Enter to continue, or 3 to Cancel the removal process.

```
Welcome to the InstallShield Wizard for IBM System Storage DS Command-Line
Interface (CLI)
The InstallShield Wizard uninstalls IBM System Storage DS Command-Line Interface
on your computer.
```

```
To continue, choose Next.
```

```
DS Command-Line Interface
IBM Corporation
```

```
Press 1 for Next, 3 to Cancel or 4 to Redisplay [1]
```

3. The Uninstallation Location screen is displayed. Press 1 and Enter to continue, or 3 and Cancel to exit the removal process.

IBM System Storage DS Command-Line Interface will be uninstalled from the following location:

C:\Program Files\ibm\dsccli

Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]

4. The Uninstallation progress screen is displayed while the command-line interface is being removed.

Uninstalling IBM System Storage DS Command-Line Interface...

5. The Uninstallation Finish screen is displayed. Press 3 to finish the removal.

The InstallShield Wizard has successfully uninstalled IBM System Storage DS Command-Line Interface. Choose Finish to exit the wizard.

Press 3 to Finish or 4 to Redisplay [3]

---

## Removing the DS CLI from your system using graphical mode

Use the graphical mode to remove the DS CLI from your system when the DS CLI is installed on a Windows, Novell, or UNIX system.

### Notes:

1. The following procedure applies to the removal of only the DS CLI application. This procedure cannot be used to remove other versions of the CLI.
2. If you do not want to create a new profile when you reinstall the CLI, select to not delete the DS CLI profile as you complete this task.

You use the Add/Remove Programs facility of the Windows operating system to remove the DS CLI from your system. When you have processed the uninstall steps, restart your system to complete the uninstall. Perform the following steps to remove the DS CLI using the graphical mode.

1. Navigate to the Windows Control Panel and open the Add/Remove program facility.
2. Scroll the list of currently installed programs and click the listing for IBM System Storage DS Command-Line Interface.
3. Click the **Change/Remove** button and the Welcome window for the Uninstaller is displayed.
4. Click **Next** to continue or click **Cancel** to exit the removal process. When you click **Next**, the Confirmation window is displayed that shows the directory from which the DS CLI program is removed.
5. Click **Remove** to continue or **Cancel** to stop the removal and exit the uninstall process. Click **Back** to return to the previous window. When you click **Remove**, the Uninstallation Progress window is displayed. When the uninstall process is finished, the Finish window is displayed, which contains a statement about the success or failure of the uninstall process. Click **Finish** to close.

If the uninstall program does not remove some information from your system, the Restart window is displayed. You must restart so that previously locked files are released and automatically deleted.

6. Close the Add/Remove Programs window.
7. Restart your system, if required (now or later), to complete the removal process.



---

## Removing the DS CLI from an OpenVMS system

The removal of the DS CLI application from an OpenVMS system requires not only a removal from your main system but also a removal from your startup, login, and shutdown processes.

Perform the following steps to remove the CLI from your OpenVMS system:

1. Log on to your host system as a user with SYSLCK, SYSNAM, SYSPRV (or a system group UIC), TMPMBX, and CMKRNL privileges.
2. Type the following command at the command prompt to start the uninstallation process: `PRODUCT REMOVE IBMDSCLI`. A message similar to the following is displayed.

The following product has been selected:

|                            |                 |
|----------------------------|-----------------|
| IBM AXPVMS DSCLI V5.0-1F96 | Layered Product |
|----------------------------|-----------------|

Do you want to continue? [YES]

3. Press Enter to confirm the uninstallation. The following uninstallation confirmation message with completion status is displayed.

The following product will be removed from destination:

|                            |                                  |
|----------------------------|----------------------------------|
| IBM AXPVMS DSCLI V5.0-1F96 | DISK\$V732_ALPHA: [VMS\$COMMON.] |
|----------------------------|----------------------------------|

Portion done: 0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%

When the uninstallation process ends, a message similar to the following is displayed.

The following product has been removed:

|                            |                 |
|----------------------------|-----------------|
| IBM AXPVMS DSCLI V5.0-1F96 | Layered Product |
|----------------------------|-----------------|

4. Remove the command-line interface startup, login, and shutdown functions from your system startup, login, and shutdown processes.

---

## Removing the DS CLI from a System i system

This section contains information to help you uninstall the DS CLI from a System i system.

Because the DS CLI is installed on a System i system from a remote system, it is not possible to use the conventional DS CLI removal methods that you use with other systems.

When the DS CLI was installed onto your System i system, you used a remote system to perform the installation (for example, Windows, UNIX or AIX). Part of the installation process is the creation of an uninstaller. However, because you were using another system to do your installation, the uninstaller that was created was for the system that you installed from and not for the System i system. This uninstaller cannot be used to uninstall the DS CLI.

When you want to uninstall the DS CLI, you can use one of the following two methods:

- Uninstall directly from your i5/OS iSeries system.

You might use this method if you are not planning to upgrade the DS CLI and you want to totally remove the DS CLI from your System i system.

- Uninstall using a remote system.

You might use this method when you are upgrading the DS CLI, because after the removal, you can use this remote system to install the upgraded DS CLI.

## Removing the DS CLI using your System i system directly

Complete this task to remove the DS CLI through the direct use of your System i system.

You cannot use the conventional DS CLI removal methods that are used on other systems because the installation of the DS CLI on your System i system was done from a remote system. The remote installation does not allow the creation of an uninstaller that can be used directly by your System i system for the removal process. However, it is possible to use your System i system directly (bypassing the uninstaller) to remove the DS CLI application.

You cannot use the uninstaller that was created for the DS CLI when you originally installed the DS CLI because it was created for the remote system that you used for the installation and not for the System i system.

You can perform this procedure at any time. However, it is common to perform this procedure when you want to remove the DS CLI from your system, but you do not intend to perform an associated upgrade of the DS CLI application.

**Note:** The i5/OS direct removal method requires that you use the i5/OS console mode and that you issue an i5/OS command. The following steps presume that you are logged in to the i5/OS and have the authority to issue a removal command.

Perform the following steps to remove the DS CLI through the direct use of your System i system:

1. Issue the following command from your i5/OS application:

```
RUNJAVA CLASS(run) PARM('-console')
CLASSPATH('/QIBM/ProdData/Java400/jt400ntv.jar:/yourdir/_uninst
/uninstall.jar')
```

Substitute your uninstall directory for *yourdir*.

2. Wait until the uninstall process is complete before you continue with your next process.

## Removing the DS CLI from your System i system using the remote method

Complete this task to remove the DS CLI from your System i system using the remote method.

You cannot use the conventional DS CLI removal methods that are used on other systems because the installation of the DS CLI on your System i system has been done from a remote system. The remote installation does not allow the creation of an uninstaller that can be used directly by your System i system for the removal

process. However, it is possible to use the remote removal method on your System i system to remove the DS CLI application.

Ensure that the remote system that you use to uninstall the DS CLI is network-attached to the System i system and is a supported platform for DS CLI.

You can use the following remote method to remove the DS CLI from a System i system. You can perform this procedure at any time. However, it is common to perform this procedure when you want to upgrade the DS CLI application, because the remote system that you are using to remove the DS CLI is typically the same system that you use for the upgrade.

To remove the DS CLI from your System i system using the remote method, perform the following steps:

1. Use FTP to copy the `uninstall.dat` and `uninstall.jar` files from the `uninstall` directory on your System i system into a common directory on the machine that you are using to do the uninstall.
2. Invoke the uninstall process from the common directory (or point to it using the `classpath [-cp]` option) by issuing the following command: `java -cp uninstall.jar run -os400 <system> <userid> <password>`
3. Wait until the uninstall process is completed before you continue to your next process.



---

## Chapter 13. Command-line interface scenarios

These scenarios describe some typical configuration and configuration management tasks. You can use them as models for writing your own scripts.

The following tasks are illustrated:

- Determining the physical configuration characteristics of a storage unit.
- Determining the current logical storage and Copy Services configuration settings.
- Creating new logical storage and Copy Services configuration settings.
- Modifying or deleting logical storage and Copy Services configuration settings.

---

### Modifying fixed block volume groups

This scenario describes how to modify fixed block storage within a storage unit.

To modify fixed block volume groups, you must have the command-line interface prompt, and you must be connected to a storage unit that will be used for open systems host system storage.

Adding volumes to a volume group and removing volumes from a volume group are typical storage management tasks. The volumes that are added to a volume group can be “unassigned” to a volume group, or they can be volumes that are assigned to a volume group but you want to move them to a different volume group. In either case, you are responsible for managing how the volumes are allocated to volume groups and how the volumes are reserved for future allocation. It is better that you maintain “unassigned” volumes in a volume group that is not accessible by any host system, thereby controlling the accessibility of volumes that are reserved for future allocation.

You can assign a fixed block volume to multiple volume groups. This might be necessary for some host system applications. However, damage to volume data can occur if a volume is accessed by different host systems using different file management systems. To assign a fixed block volume to multiple volume groups, perform the following steps:

1. Find the fixed block volumes that are to be assigned to a volume group using the following command.

```
dscli> lsfbvol -dev ID -datatype 512 | 520p | 520u -extpool ID
```

The command creates a list of all volumes of the specified volume type within the specified extent pool. It includes only the volumes that are contained by the specified storage image.

2. Retrieve the current volume group volume map using the following command.

```
dscli> showvolgrp -dev ID volume_group_ID
```

The command creates a list of volumes that are assigned to the target volume group.

3. Modify the volume group using the following command.

```
dscli> chvolgrp -dev ID -action add | remove | replace -volume
ID,ID,...,ID volume_group_ID
```

You can add or remove volume IDs to the list in order to add or remove volumes. This command applies the updated volume ID list.

---

## Deleting data storage configurations

This section describes how you can delete or remove fixed block or count key data storage within a storage unit by using the command-line interface. This applies to entire configurations and not just the removal of a volume or volume group.

Before you begin, you must be logged into the DS CLI application in interactive command mode. You must also be connected to a storage image that is used for open systems host system storage.

Deleting data storage configurations involves the following steps:

1. Remove host access to the volumes that will be removed.
  - For fixed block storage, the SCSI host port IDs must be removed.
  - For count key data storage, the CKD volumes are automatically removed from the FICON/ESCON-All volume group ID (10) when the CKD volumes are deleted.
2. Remove the volume groups.
  - For fixed block storage, if all of the fixed block volumes are being removed, the associated volume groups must be removed.
  - The FICON/ESCON-All volume group is automatically removed when the last CKD volume is removed.
3. Remove the volumes. This applies to both fixed block and count key data storage.
4. Remove the logical control units (CKD only).

**Note:** Logical subsystems (LSS) are automatically removed when the fixed block volumes are removed.

5. Remove the ranks.
6. Remove the arrays.
7. Remove the extent pools.

When all the steps have been completed, the array sites that have been freed are designated as unassigned. They can be redefined to make new fixed block or CKD storage resources.

### Deleting a fixed block data storage configuration

Complete this task to delete a fixed block data storage configuration.

To delete fixed block data storage, you must have the command-line interface prompt, and you must be connected to a storage unit that contains configured storage.

Deleting a storage configuration involves several steps that systematically remove host access to the data storage, and then removes the storage elements (arrays, ranks, extent pools, volumes, and volume groups) in order to restore the physical resource to an “equivalent to new” state.

To delete fixed block data storage, perform the following steps:

1. Remove host access to the volumes that will be removed. This generally requires the issuance of the **lshostconnect** command and the **rmhostconnect** command.

- a. Issue the **lshostconnect** command to display a list of SCSI host port IDs that are associated with the storage to be removed. Enter the **lshostconnect** command at the dscli command prompt as follows:

```
dscli>lshostconnect -dev IBM.1750-68FA120 -l -portgrp 1
```

**Notes:**

- 1) The **-portgrp port\_grp\_number** parameter is used to only list those port IDs that are associated with a port group number that you assigned when you originally created the host connection.
  - 2) The **-l** parameter is used to generate the detailed status report for each host connection.
- b. Issue the **rmhostconnect** command to delete the SCSI host port IDs that are associated with the storage volumes to be removed. Enter the **rmhostconnect** at the dscli command prompt as follows:

```
dscli>rmhostconnect -dev IBM.1750-68FA120 1
```

**Notes:**

- 1) The **host\_connect\_ID** parameter (1 in the command example) is required and is a unique identifier (0 - 65 534) within the scope of a storage unit.
  - 2) A message is displayed with a request that you confirm the deletion of the host connection.
2. Find the volume groups and volume group storage maps by issuing the **lsvolgrp** and **showvolgrp** commands.
    - a. Issue the **lsvolgrp** command to display a list of defined volume group IDs and their characteristics. Enter the **lsvolgrp** command at the dscli command prompt as follows:

```
dscli>lsvolgrp -dev IBM.1750-68FA120 -l
```
    - b. Issue the **showvolgrp** command to display the detailed properties of the volume group that you want to delete. Enter the **showvolgrp** command at the dscli command prompt as follows:

```
dscli>showvolgrp -dev IBM.1750-68FA120 -lunmap V1001
```

Repeat the **showvolgrp** command for each volume group you want to delete.
- Note:** The **Volume\_Group\_ID** (V1001) parameter is required. The shortened form is allowed when you designate the **-dev** parameter.
- c. Copy the list of volumes within the volume group for later use when you analyze which volumes that you want to remove.
3. Remove the volume groups, as a means to remove volume access by host systems, by issuing the **rmvolgrp** command. Enter the **rmvolgrp** command at the dscli command prompt as follows:

```
dscli>rmvolgrp -dev IBM.1750-68FA120 V123-V125
```

**Notes:**

- a. All volume groups that are specified for deletion must belong to the same storage unit.
- b. The **Volume\_Group\_ID** parameter (V123-V125 in the example) is required. The shortened version of the ID is allowed if you designate the **-dev** parameter.

- c. The example command shows a range of volume group IDs. If you have another volume group or another volume group range, you must add a blank between the designations (for example, V123-V125 V130-V133 V135)
- d. A message is displayed for each deleted volume group ID or range of volume group IDs. The message requests that you confirm the deletion.

4. Remove the fixed block volumes by issuing the **rmfbvol** command. This action enables the removal of the associated ranks, arrays and extent pools. Enter the **rmfbvol** command at the dscli command prompt as follows:  

```
dscli>rmfbvol -dev IBM.1750-68FA120 0100 0101
```

**Notes:**

- a. The associated logical subsystem (LSS) is automatically removed when the last volume that is contained by the LSS is removed.
- b. The *Volume\_ID* parameter (represented by 0100 0101 in the example) is required when you issue the **rmfbvol** command. The shortened version of the ID is allowed if you designate the **-dev** parameter.
- c. A message is displayed for each volume that is deleted. The message requests that you confirm the deletion.

5. Remove the ranks by issuing the **lsrank** and **rmrank** commands.
  - a. Issue the **lsrank** command to display a list of rank IDs to be removed. Use the command parameters to develop a selective list of rank IDs. Enter the **lsrank** command at the dscli prompt as follows:  

```
dscli>lsrank -dev IBM.1750-68FA120 -1
```

**Note:** Rank IDs that indicate extents used = 0 are eligible to be removed. If extents used are greater than 0 then rank segments are currently assigned to existing volume IDs.

- b. Issue the **rmrank** command to remove the ranks that are assigned to the arrays. Enter the **rmrank** command at the dscli prompt as follows:

```
dscli>rmrank -dev IBM.1750-68FA120 R23
```

**Notes:**

- 1) The *rank\_ID* parameter (R23 in the example) is required. The shortened version of the ID is allowed if you designate the **-dev** parameter.
- 2) You must remove the ranks before you can remove the arrays and extent pools.
- 3) The processing time that is associated with the **rmrank** command can be lengthy and might inhibit your use of the array on which this command is being processed.
- 4) When the **rmrank** command is issued, the following processing occurs:
  - The rank is unassigned from the array.
  - The rank is removed. When this is successful, a message is displayed. This part of the process does not take long; however, the processing that is associated with this command is not complete even though you have received a message that the rank was removed.
  - The array is formatted. This processing can take some time. During this processing the array cannot be removed or



assigned to another rank. Also, until this process is fully completed, the rank is listed as assigned to the array from which it is has been removed.

- You can check the progress of the **rmrank** command by logging onto another session of DS CLI. Issue the **lsarray** command against the storage unit where the rank or ranks are being deleted. When you no longer see the rank that is assigned to the array from which you removed it, the remove rank process is complete.

6. Remove the arrays by issuing the **lsarray** and **rmarray** commands.

- a. Issue the **lsarray** command to obtain a list of array IDs to be removed. Enter the **lsarray** command at the dscli prompt as follows:

```
dscli>lsarray -dev IBM.1750-68FA120 -state unassigned
```

**Notes:**

- 1) The **-state unassigned** parameter allows you to narrow your list to just the array IDs that are not assigned to a rank ID.
  - 2) If you issue the **lsarray** command without using the **-state** parameter, it is possible you will see a list of arrays that have a state of **unavailable**. This is generally a good indication that the ranks have not been removed and that the drives are still formatting. You must wait until the ranks have been removed and the drives have been formatted before you can proceed.
  - 3) Proceed to the next step (remove arrays) only after all the associated arrays are displayed with a state of unassigned.
- b. Issue the **rmarray** command to delete the unassigned arrays so that the array sites can be redefined as new arrays. Enter the **rmarray** command at the dscli command prompt as follows:

```
dscli>rmarray -dev IBM.1750-68FA120 A44-A48 A51
```

**Notes:**

- 1) The example command displays the use of a range of array IDs plus one additional array ID.(A44-A48 A51). A range of arrays requires the use of a hyphen and a space between the next array or another range of arrays.
  - 2) A message is displayed for each array being deleted that requests your confirmation before processing.
7. Remove the extent pools by issuing the **lsextpool** and **rmextpool** commands.

- a. Issue the **lsextpool** command to obtain a list of extent pool IDs to be removed. Enter the **lsextpool** command at the dscli command prompt as follows:

```
dscli>lsextpool -dev IBM.1750-68FA120 -l -stgtype fb
```

**Note:**

- The **-stgtype fb** parameter allows you to narrow the list so that it displays only those extent pools that are assigned for use with fixed block volumes.
- Extent pool IDs that indicate assigned ranks = 0 are eligible to be removed. If the assigned ranks are greater than 0, the extent pool potentially contains assigned storage volumes. The rank indicator must be 0 before you can remove the extent pool.

- b. Issue the **rmextpool** command to delete extent pool IDs that do not contain assigned rank IDs. Enter the **rmextpool** command at the dscli command prompt as follows:

```
dscli>rmextpool -dev IBM.1750-68FA120 P21-P25 P30
```

**Notes:**

- 1) All rank assignments must be deleted before the extent pool can be deleted.
- 2) The example command displays the use of a range of extent pool IDs plus one additional extent pool ID (P21-P25 P30). A range of extent pool IDs requires the use of a hyphen and a space between the next extent pool ID or next range of extent pool IDs.

## Deleting a count key data storage configuration

Complete this task to delete a count key data storage (CKD) configuration.

To delete CKD storage, you must have the command-line interface prompt, and you must be connected to a storage unit that contains configured storage.

Deleting a CKD storage configuration starts with the removal of the CKD volumes and proceeds with the removal of each of the other elements (ranks, arrays, and extent pools) in order to restore the physical resource to an “equivalent to new” state.

**Note:** There is no reason to remove the volume groups because the internal code automatically assigns and unassigns CKD volumes to the FICON/ESCON-All volume group ID (10).

To delete CKD storage, perform the following steps:

1. Remove the CKD volumes by issuing the **lsckdvol** and **rmckdvol** commands.
  - a. Issue the **lsckdvol** command to display a list of CKD volume IDs. Analyze the list to determine which IDs can be removed. Enter the **lsckdvol** command at the dscli command prompt as follows:

```
dscli>lsckdvol -dev IBM.1750-68FA120 -lcu 00 -l
```

**Notes:**

- 1) You can narrow the list of volume IDs for the designated storage unit by using the supported parameters of the **lsckdvol** command.
  - 2) The example displays the use of the **-lcu** parameter with a value of 00. Logical control unit (LCU) values are in the range 00 - 1E. You must specify a specific LCU; otherwise, the entire storage unit is queried, which results in a longer processing time.
- b. Issue the **rmckdvol** command to delete volumes. This action enables the removal of the associated ranks, arrays, and extent pools. Enter the **rmckdvol** command at the dscli command prompt as follows:

```
dscli>rmckdvol -dev IBM.1750-68FA120 0100 0101
```

**Note:**

- The **Volume\_ID** parameter (represented by the values 0100 0101 in the command example) is required when you issue the **rmckdvol** command.

- A message is displayed for each volume that is being deleted. The message requests that you confirm the deletion.
2. Issue the **rmlcu** command to delete LCUs so that the address groups can be redefined for use with fixed block or CKD volumes. Enter the **rmlcu** command at the dscli command prompt as follows:

```
dscli>rmlcu -dev IBM.2107-68FA120 00-03 08
```

**Note:** The example command displays the use of a range of LCU IDs plus one additional LCU ID (00-03 08). A range of LCU IDs requires the use of a hyphen. If you add an additional LCU ID or a range of LCU IDs, you must allow a space between the next LCU ID or another range of LCU IDs.

3. Remove the ranks by issuing the **lsrank** and **rmrank** commands.
  - a. Issue the **lsrank** command to display a list of rank IDs to be removed. Use the **lsrank** command parameters to develop a selective list of rank IDs. Enter the **lsrank** command at the dscli command prompt as follows:

```
dscli>lsrank -dev IBM.1750-68FA120 -1
```

**Note:** Rank IDs that indicate extents used = 0 are eligible to be removed. If the displayed value for extents used is greater than 0, it indicates that the ranks are currently assigned to existing volume IDs.

- b. Issue the **rmrank** command to remove the ranks that are assigned to the arrays. Enter the **rmrank** command at the dscli prompt as follows:

```
dscli>rmrank -dev IBM.1750-68FA120 R23
```

**Notes:**

- 1) You must remove the ranks before you can remove the arrays and extent pools.
- 2) The processing time that is associated with the **rmrank** command can be lengthy and might inhibit your use of the array on which this command is being processed.
- 3) When the **rmrank** command is issued, the following processing occurs:
  - The rank is unassigned from the array.
  - The rank is removed. When this is successful, a message is displayed. This part of the process does not take long; however, the processing that is associated with this command is not complete even though you have received a message that the rank was removed.
  - The array is formatted. This processing can take some time. During this processing the array cannot be removed or assigned to another rank. Also, until this process is fully completed, the rank is listed as assigned to the array from which it has been removed.
  - You can check the progress of the **rmrank** command by logging onto another session of DS CLI. Issue the **lsarray** command against the storage unit where the rank or ranks are being deleted. When you no longer see the rank that is assigned to the array from which you removed it, the remove rank process is complete.
4. Remove the arrays by issuing the **lsarray** and **rmarray** commands.

- a. Issue the **lsarray** command to obtain a list of array IDs to be removed. Enter the **lsarray** command at the dscli prompt as follows:

```
dscli>lsarray -dev IBM.1750-68FA120 -state unassigned
```

**Notes:**

- 1) The **-state unassigned** parameter allows you to narrow your list to just the array IDs that are not assigned to a rank ID.
- 2) If you issue the **lsarray** command without using the **-state** parameter, it is possible you will see a list of arrays that have a state of unavailable. This is generally a good indication that the ranks have not been removed and that the drives are still formatting. You must wait until the ranks have been removed and the drives have been formatted before you can proceed.

Proceed to the next step (remove arrays) only after all the associated arrays are displayed with a state of unassigned.

- b. Issue the **rmarray** command to delete the unassigned arrays so that the array sites can be redefined as new arrays. Enter the **rmarray** command at the dscli command prompt as follows:

```
dscli>rmarray -dev IBM.1750-68FA120 A44-A48 A51
```

**Notes:**

- 1) The example command displays the use of a range of array IDs plus one additional array ID (A44-A48 A51). A range of arrays requires the use of a hyphen and a space between the next array or another range of arrays.
- 2) A message is displayed for each array being deleted that requests your confirmation before processing.

5. Remove the extent pools by issuing the **lsextpool** and **rmextpool** commands.

- a. Issue the **lsextpool** command to obtain a list of extent pool IDs to be removed. Enter the **lsextpool** command at the dscli command prompt as follows:

```
dscli>lsextpool -dev IBM.1750-68FA120 -stgtype fb -l
```

**Notes:**

- 1) Use the **-stgtype fb** parameter to narrow the list so that it displays only those extent pools that are assigned for use with fixed block volumes.
- 2) Extent pool IDs that indicate assigned ranks = 0 are eligible to be removed. If the value for assigned ranks is greater than 0, the extent pool potentially contains assigned storage volumes. The rank indicator must be 0 before you can remove the extent pool.

- b. Issue the **rmextpool** command to delete extent pool IDs that do not contain assigned rank IDs. Enter the **rmextpool** command at the dscli command prompt as follows:

```
dscli>rmextpool -dev IBM.1750-68FA120 P21-P25 P30
```

**Notes:**

- 1) All rank assignments must be deleted before the extent pool can be deleted.
- 2) The example command displays the use of a range of extent pool IDs plus one additional extent pool ID (P21-P25 P30). A range of extent pool IDs requires the use of a hyphen. When you

add an additional extent pool ID or another range of extent pool IDs, you must put a space between the current extent pool ID value and the next extent pool ID value.

## Processing remote FlashCopy (inband) transactions

This scenario describes how to successfully process remote FlashCopy (formerly known as inband FlashCopy) transactions. These transactions can only be processed using the DS CLI remote FlashCopy commands. These transactions cannot be managed through the GUI.

You must be logged into the DS CLI application in interactive command mode.

Remote FlashCopy commands are issued to a source volume of a remote mirror and copy volume pair on a local storage unit. This enables a FlashCopy pair to be established at the remote site and eliminates the need for a network connection to the remote site solely for the management of FlashCopy. The following steps are based on an example that uses the sites LSS 22 and LSS 2A.

1. You must determine which volumes are available for use and then establish a remote mirror and copy path between LSS 22 and LSS 2A.

- a. Issue the **lsavailpprcport** command to obtain a report that lists which volumes are available for use. Enter the **lsavailpprcport** command at the dscli command prompt with the following parameters and variables:

```
dscli> lsavailpprcport -dev IBM.1750-1300861
-remotedev IBM.1750-1300871 -remotewwnn 5005076303FFC03D 22:2A
```

The following report is generated.

| Local port | Attached port | Type |
|------------|---------------|------|
| I0030      | I0031         | FCP  |
| I0031      | I0030         | FCP  |
| I0100      | I0101         | FCP  |
| I0101      | I0100         | FCP  |

- b. Issue the **mkpprcpath** command to establish the remote mirror and copy path between LSS 22 and LSS 2A. Enter the **mkpprcpath** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkpprcpath -dev IBM.1750-1300861 -remotedev IBM.1750-1300871
-remotewwnn 5005076303FFC03D
-src lss 22 -tgt lss 2A I0030:I0031 I0100:I0101
```

The following confirmation is displayed if your command input is correct.

```
Date/Time: February 7, 2005 4:25:04 PM IST IBM DSCLI Version: 0.0.0.0 DS:
IBM.1750-1300861
CMUC00149I mkpprcpath: Remote Mirror and Copy path 22:2A successfully
established.
```

2. Issue the **mkpprc** command to establish a remote mirror and copy pair (2200 to 2A00). Enter the **mkpprc** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkpprc -dev IBM.1750-1300861 -remotedev IBM.1750-1300871
-type mmir 2200:2A00
```

The following confirmation is displayed if your command input is correct.

```
Date/Time: February 7, 2005 4:25:33 PM IST IBM DSCLI Version: 0.0.0.0 DS:
IBM.1750-1300861
CMUC00153I mkpprc: Remote Mirror and Copy volume pair relationship
2200:2A00 successfully created.
```

3. Issue the **mkremoteflash** command to use LSS 22 on the local site as a conduit LSS for new remote Flash Copy relationships on the remote storage unit. These new relationships use volume 2A00 as their source. The target can be any other volume on the remote storage unit (in this scenario, 2A01). Enter the **mkremoteflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>mkremoteflash -dev IBM.1750-1300871 -conduit IBM.1750-1300861/22
-record 2A00:2A01
```

The following confirmation is displayed if your command input is correct.

```
Date/Time: February 7, 2005 4:28:11 PM IST IBM DSCLI Version: 0.0.0.0
DS: IBM.1750-1300871
CMUC00173I mkremoteflash: Remote FlashCopy volume pair 2A00:2A01 successfully
created. Use the lsremoteflash command to determine copy completion.
```

4. Issue the **resyncremoteflash** command because the remote FlashCopy relationship (2A00:2A01) was created with the **-record** parameter. Enter the **resyncremoteflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>resyncremoteflash -dev IBM.1750-1300871 -conduit IBM.1750-1300861/22
-record 2A00:2A01
```

The following confirmation is displayed if your command input is correct.

```
CMUC00175I resyncremoteflash: Remote FlashCopy volume pair 2A00:2A01
successfully resynched. Use the lsremoteflash command to determine copy
completion.
```

5. Issue the **lsremoteflash** command to verify that the transaction has processed as you intended. Enter the **lsremoteflash** command at the dscli command prompt with the following parameters and variables:

```
dscli>lsremoteflash -dev IBM.1750-1300871 -conduit IBM.1750-1300861/22 2A00:2A01
```

The following report is displayed if your command input is correct.

| ID        | SrcLSS | Sequence Num | ActiveCopy | Recording |
|-----------|--------|--------------|------------|-----------|
| 2A00:2A01 | 2A     | 0            | Disabled   | Enabled   |

| Persistent | Revertible | SourceWrite<br>Enabled | TargetWrite<br>Enabled | Background<br>Copy |
|------------|------------|------------------------|------------------------|--------------------|
| Enabled    | Disabled   | Disabled               | Disabled               | Enabled            |

---

## Configure support options using the DS CLI

This scenario provides a high-level description of the tasks that you must perform to configure support options using the command-line interface. Support options (for example, e-mail alerts and alert traps that are sent by an SNMP agent) enable IBM support personnel to quickly assist you with problem determination and, with your consent, remotely perform certain maintenance procedures.

**Note:** The Call Home function also has a modem call home feature. The DS CLI cannot be used to configure this feature. You must use the DS Storage Manager to configure the modem call home feature.

Before you begin, you must have the command-line interface prompt, and you must be connected to a storage unit that is used for open systems host system storage.

This scenario first creates the contact information and then establishes the SMTP port and IP address where a message is sent in the event of a problem. After these two tasks are completed, you can activate the Call Home function and verify that the Call Home function works according to your specifications. You can also set up your storage unit to receive alert traps.

1. Set up the contact information.

The contact information that you supply is sent to IBM so that an IBM service representative can contact you. The type of information that you must supply consists of the following but is not limited to this list:

- Company name
- Company address
- Country
- State or province
- Primary contact phone number
- Primary e-mail address (required if you are using the Call Home e-mail notification feature).

See “Setting up contact information using the DS CLI” on page 45 for details.

2. Set up the e-mail notification process.

Using e-mail, the Call Home function can notify IBM when a problem occurs on your storage unit. You must specify the SMTP port and IP address where the message is sent in the event of a problem.

See “Setting up Call Home (SMTP) notifications using the DS CLI” on page 47 for details.

3. Activate and verify the Call Home function.

After you provide your contact information and specify the SMTP port and IP address where the message is sent in the event of a problem, you can activate and test Call Home.

See “Activating the Call Home function using the DS CLI” on page 49 for details.

4. Set up the SNMP alert notifications process.

One of the support options you can configure for your storage unit involves the notification of Simple Network Management Protocol (SNMP) alert traps. SNMP notifications are alerts and notifications of thresholds that have been exceeded and exception events that have occurred.

See “Setting up SNMP notifications using the DS CLI” on page 50 for details.

5. Set up the Service information messages (SIM) notification process.

SIMs are generated by a storage unit for S/390 and zSeries hosts. You can designate the level of error you want to be notified about and how often you want to be notified.

See “Setting up SIM notifications using the DS CLI” on page 51 for details.

---

## **Metro Mirror test scenario: failback operation from local to remote site**

This scenario describes the steps required to test the failover and failback procedures in which a failback is done from the local site to the remote site. This test allows you to bring up a test application on the remote volumes. Then, after the test is complete, resynchronize the remote volumes from the local (production) volumes by copying only changed tracks.

Assume the following for this scenario:



- Production is running at Site A (the local site).
- You have simulated a disaster by disabling the links between the local and remote storage units.

Complete these steps for the failover and failback test scenario. (The parameters and values included in this scenario are examples.)

1. **Freeze updates to the primary (A) volumes in Metro Mirror relationships across the affected LSSs.** This process ensures that the secondary (B) volumes will be consistent at the time of the freeze. (One command per LSS is required.) Enter the **freezepprc** command at the dscli command prompt with the following parameters and variables:

```
freezepprc -dev IBM.2107-130165X -remotedev IBM.2107-75ALA2P 07:12
```

The following represents an example of the output:

```
CMUC00161W freezepprc: Remote Mirror and Copy consistency group 07:12 successfully created.
```

As a result of the freeze action, the following processing occurs:

- I/O processing to the Metro Mirror volume pairs is temporarily queued during the time that updates are frozen.
- The volume pairs that are associated with the source and target LSSs are suspended. During this time, updates are collected using the change recording feature on the Site A volumes.
- The established paths between the LSS pairs are disabled.

2. **Resume operations following a freeze.**

Issue the **unfreezepprc** command to allow I/O activity to resume for the specified volume pairs. Enter the **unfreezepprc** command at the dscli command prompt with the following parameters and variables:

**Note:** This action is sometimes referred to as a *thaw* operation.

```
dscli> unfreezepprc -dev IBM.2107-130165X -remotedev IBM.2107-75ALA2P 07:12
```

The following represents an example of the output:

```
CMUC00198I unfreezepprc: Remote Mirror and Copy pair 07:12 successfully thawed.
```

3. **At Site B (remote site), issue a failover command to the B to A volume pairs.** Enter the **failoverpprc** command at the dscli command prompt with the following parameters and variables:

```
dscli> failoverpprc -dev IBM.2107-75ALA2P -remotedev IBM.2107-130165X -type mmir 1200-125f:1a00-1a5f
```

The following represents an example of the output:

```
CMUC00196I failoverpprc: Remote Mirror and Copy pair 1200:1A00 successfully reversed.
CMUC00196I failoverpprc: Remote Mirror and Copy pair 1201:1A01 successfully reversed.
```

When this command processes, the following occurs:

- The B volumes become suspended primary volumes. Updates are collected using the change recording feature on the volumes.
- The A volumes are suspended primary volumes.

4. **Allow test I/O to start at Site B.**

5. **When testing is complete, perform the following steps:**

- a. **Quiesce test I/O at Site B (remote site).**
- b. **Enable the remote mirror and copy links between the storage units across the two sites. (The paths will not reestablish automatically.)**



- c. **Reestablish paths between the local and remote site LSSs that contain the Metro Mirror volume pairs.** Enter the **mkpprcpath** command at the dscli command prompt with the following parameters and variables:

```
dscli> mkpprcpath -dev IBM.2107-130165X -remotedev IBM.2107-75ALA2P
-remotewwnn 5005076303FFC550 -src1ss 07 -tgt1ss 12 -consistgrp
I0102:I0031 I0002:I0102
```

The following represents an example of the output:

```
CMUC00149I mkpprcpath: Remote Mirror and Copy path 07:12
successfully established.
```

6. **At the local site, issue a failback command to the A to B volume pairs.** Enter the **failbackpprc** command at the dscli command prompt with the following parameters and variables

```
dscli> failbackpprc -dev IBM.2107-130165X -remotedev IBM.2107-75ALA2P
-type mmir 1a00-1a5f:1200-125f
```

The following represents an example of the output:

```
CMUC00197I failbackpprc: Remote Mirror and Copy pair 1200:1A00
successfully failed back.
CMUC00197I failbackpprc: Remote Mirror and Copy pair 1201:1A01
successfully failed back.
```

When this command processes, the following occurs:

- Updates that are made to the volumes at Site B are recorded with the change recording feature. Changed tracks of data are copied from the Site A volumes to Site B volumes.
- When the copy process is complete, the Site A volumes will be synchronized with the Site B volumes.

7. **Production I/O continues to the A volumes.**

---

## Allowed remote mirror and copy volume pair conversions

This topic describes allowed volume pair conversions using the remote mirror and copy function.

You can convert remote mirror and copy volume pairs between copy modes. For example, you can convert volume pairs in Global Copy to Metro Mirror mode and vice versa. If you create a Global Copy volume pair where the source volume was associated with a 1750 storage unit and the target volume was associated with an ESS 2105 Model 800 or 750, you can convert that volume pair to Metro Mirror mode.

Before you establish remote mirror and copy volume pairs, logical paths must be established between the source and target logical subsystem (LSS). I/O ports must be available and configured before you can establish paths between the source and target LSSs. Each LSS with source volumes requires at least one path to be established to the LSS that holds the target volumes.

The following **mkpprcpath** command establishes remote mirror and copy paths:

```
dscli>mkpprcpath -dev storage_image_ID -remotedev storage_image_ID
-remotewwnn wwnn -src1ss source_LSS_ID -tgt1ss target_LSS_ID
source_port_ID:target_port_ID
```

### Example

```
dscli>mkpprcpath -dev IBM.1750-75FA120 -remotedev IBM.1750-68FA150
-src1ss 00 -tgt1ss 00 -remotewwnn 12341234000A000F
I1A10:I2A20
```

## Convert Metro Mirror volume pairs to Global Copy mode

You can convert a Metro Mirror volume pair to Global Copy mode. For example, because Global Copy can operate at very long distances, well beyond the 300 km (maximum supported distance for Metro Mirror), you might want to convert some Metro Mirror volume pairs, which contain less critical application data, to Global Copy mode.

The following **mkpprc** command converts Metro Mirror volume pairs Global Copy mode:

```
dscli> mkpprc -dev storage_image_ID -remotedev storage_image_ID
-type gcp SourceVolumeID:TargetVolumeID
```

### Example

```
dscli>mkpprc -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150
0100:0100 -type gcp 0101:0101 0102:0102 0103:0103
```

## Convert Global Copy volume pairs to Metro Mirror mode

There are two common situations when you would convert a Global Copy volume pair to a Metro Mirror mode:

- You have used Global Copy to complete the bulk transfer of data in the creation of many copy pairs, and you now want to convert some or all of those pairs to Metro Mirror mode. This process resynchronizes the volume pairs by copying all changed data from the source volumes to the target volumes.
- You have Global Copy pairs for which you want to make FlashCopy backups on the remote site. You convert the pairs temporarily to synchronous mode in order to obtain a point-in-time consistent copy.

The following **mkpprc** command converts Global Copy volume pairs to Metro Mirror mode:

```
dscli> mkpprc -dev storage_image_ID -remotedev storage_image_ID
-type mmir SourceVolumeID:TargetVolumeID
```

### Example

```
dscli>mkpprc -dev IBM.1750-68FA120 -remotedev IBM.1750-68FA150
0100:0100 -type mmir 0101:0101 0102:0102 0103:0103
```

---

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VS07171L



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# Index

## Numerics

2105 to DS8000 DS CLI upgrade 5

## A

accessibility 550  
account information 48  
account setup 51  
add volumes to session, CLI 140  
adding ranks to extent pool, DS CLI 97  
address group 69  
AIX  
    CLI installation considerations 9  
    LIBPATH handling 9  
AIX LIBPATH 26  
alert traps 50  
alias volumes 340  
applykey 234  
arrays status 94  
arrays, creating (ckd) 81  
arrays, creating (FB) 67  
arrays, deleting 95  
assigning ranks 82  
audit report, console 491

## B

background copy 170

## C

Call Home  
    account information 48  
    activating 49  
    testing 49  
Call Home, CLI  
    enabling 499  
changing volume states  
    Metro Mirror (DS CLI) 127, 136  
chckdvol 334  
checking command usage 39  
chextpool 314  
chfbvol 357  
chhostconnect 268  
chlcu 324  
chlss 352  
chpass 225  
chrank 302  
chsession 483  
chsi 250  
chsu 245  
chuser 225  
chvolgrp 377  
Cisco MDS 9216 Multilayer Fabric  
    Switch 7, 451, 467  
ckd  
    creating LCU 83  
CKD  
    deleting configurations 536

CKD (*continued*)  
    volume removal 341  
CKD configuration error 85  
CKD configuration error, correcting 86  
ckd volume  
    creating arrays 81  
CKD volume rank 82  
ckd volumes, creating 85  
CLI  
    displaying  
        WWNN 118  
    pause 125  
    postinstallation 35  
    resuming Metro Mirror  
        relationship 124  
CLI commands on a command line 36  
CLI commands, overview 181  
CLI default configuration profile file 53  
CLI help 40  
CLI history function 39  
CLI interactive mode 39  
closeproblem 524  
command flags 181  
command line presentation 36  
commands  
    applykey 234  
    chckdvol 334  
    chextpool 314  
    chfbvol 357  
    chhostconnect 268  
    chlcu 324  
    chlss 352  
    chpass 225  
    chrank 302  
    chsession 483  
    chsi 250  
    chsu 245  
    chuser 225  
    chvolgrp 377  
    closeproblem 524  
    commitflash 389  
    commitremoteflash 407  
    diagsi 251  
    dscli 217  
    failbackpprc 438  
    failoverpprc 441  
    freezepprc 455  
    lsaddressgrp 323  
    lsarray 294  
    lsarraysite 289  
    lsavailpprcport 424  
    lsckdvol 334  
    lsddm 240  
    lsxtpool 315  
    lsfbvol 358  
    lsflash 392  
    lshostconnect 273  
    lshosttype 287  
    lshostvol 278  
    lsioport 259  
    lskey 235

commands (*continued*)  
    lslcu 326  
    lslss 353  
    lspe 523  
    lsportprof 279  
    lspprc 444  
    lspprcpath 427  
    lsproblem 525  
    lsrank 303  
    lsremoteflash 412  
    lsserver 252  
    lssession 485  
    lssi 254  
    lsss 521  
    lstgencl 237  
    lssu 245  
    lsuser 228  
    lsvolgrp 379  
    managehostconnect 280  
    managepwfile 228  
    mkaliasvol 342  
    mkarray 298  
    mkckdvol 340  
    mkesconpprcpath 431  
    mkextpool 317  
    mkfbvol 364  
    mkflash 396  
    mkgmir 467  
    mkhostconnect 281  
    mklcu 328  
    mkpe 517  
    mkpprc 451  
    mkpprcpath 433  
    mkrank 307  
    mkremoteflash 415  
    mksession 484  
    mkuser 231  
    mkvolgrp 381  
    offloadauditlog 491  
    overview structure 181  
    pausegmir 469  
    pausepprc 457  
    resumegmir 470  
    resumepprc 459  
    resyncflash 390  
    resyncremoteflash 409  
    reverseflash 398  
    revertflash 401  
    revertremoteflash 418  
    rmarray 298  
    rmckdvol 341  
    rmextpool 318  
    rmfbvol 366  
    rmflash 402  
    rmgmir 472  
    rmhostconnect 284  
    rmlcu 330  
    rmpprc 462  
    rmpprcpath 435  
    rmrank 308  
    rmremoteflash 420

commands (*continued*)

- rmssession 490
- rmuser 232
- rmvolgrp 383
- sendpe 520
- sendss 520
- setcontactinfo 502
- setdialhome 499
- setflashrevertible 405
- setioport 263
- setoutput 221
- setplex 495
- setremoteflashrevertible 422
- setsim 501
- setsmtp 499
- setsnmp 500
- showarray 299
- showarraysite 292
- showckdvol 344
- showcontactinfo 514
- showextpool 319
- showfbvol 368
- showgmir 474
- showgmircg 480
- showgmiroos 481
- showhostconnect 285
- showioport 264
- showlcu 331
- showlss 355
- showpass 233
- showplex 496
- showrank 309
- showsi 257
- showsu 247
- showuser 233
- showvolgrp 384
- testcallhome 515
- unfreezeflash 404
- unfreezepprc 465
- ver 236
- commitflash 389
- commitremoteflash 407
- concurrent copy
  - modifying
    - timeout value (DS CLI) 128
- conduit LSS 543
- configuration error 73
- configuration profile file 53
- configuring
  - fibre-channel I/O ports 76, 87
- configuring I/O port, System i 76, 87
- connection ID, caution 268
- consistency group 165
  - modifying
    - timeout value (DS CLI) 128
- consistency group parameters, CLI 141
- consistency groups
  - creating (DS CLI) 131
- console audit report 491
- console mode installation, DS CLI 16
- contact information, CLI 45
- controlling CLI page help 40
- conversions
  - Global Copy
    - to Metro Mirror 547
  - Metro Mirror
    - to Global Copy 547

- converting
  - Metro Mirror (DS CLI) 134
  - volume pairs 134
- Copy Services
  - across 2105 and 1750 137
  - across 2105 and 2107 137
- correcting
  - path-related configuration error 120
  - wrong value for remote WWNN 120
  - wrong value for target LSS ID 120
- correcting a CKD configuration error 86
- correcting fixed block configuration error 73
- correcting FlashCopy relationships, commitflash command 168
- correcting FlashCopy relationships, revertflash command 167
- count key data volumes
  - creating extent pools 80
- create FlashCopy relations, Global Mirror 152
- create Global Copy pairs 151
- create paths, Global Mirror 149
- creating
  - ckd volumes 85
  - consistency group (DS CLI) 123, 131
  - extent pools, fixed block 66
  - fixed block volume groups 73
  - fixed block volumes 69
  - FlashCopy relationship 105
  - LUN volumes 71
  - Metro Mirror volume pair
    - using a 2105 (DS CLI) 137
  - persistent FlashCopy 106
  - ranks for CKD volumes 82
  - SCSI host port connections 77
  - volume groups for System i 75
- creating a rank, DS CLI 68
- creating arrays (ckd) 81
- creating arrays (FB) 67
- creating extent pools, CKD 80
- critical heavy mode 451
- critical mode setting (DS CLI) 129
- critical volume mode 451

## D

- DDM status 93
- default CLI settings 53
- default directories 36
- default report format 221
- delete arrays 95
- delete extent pools, DS CLI 93
- delete LCUs 103
- delete ranks 100
- deleting
  - FlashCopy relationships 108
  - paths 121
  - single volume relationship (DS CLI) 136
  - volume pair (DS CLI) 127
- deleting CKD configurations 540
- deleting fixed block configuration 536
- delim report format 221
- determining
  - available I/O ports 134
- diagsi 251
- disaster recovery
  - drain time 174
  - failback
    - scenario (DS CLI) 132
  - failover (DS CLI) 132
  - failover B volumes to A volumes 164
  - first pass 174
  - OOS 174
  - quiesce your system 174
- disaster recovery, Global Mirror
  - background copy 170
  - begin the failback recovery process 172
  - checking status 163
  - consistency group analysis 165
  - correcting FlashCopy relationships, commitflash command 168
  - end Global Mirror processing 162
  - fast reverse restore 169
  - Global Copy failback 177
  - Global Copy failover 177
  - process overview 161
  - reestablish FlashCopy relationships, B to C 171
  - reestablishing paths 175
  - resume Global Mirror processing 178
  - resume Global Mirror processing at the A site 178
  - resynchronize B volumes to A volumes 173
  - revertflash and FlashCopy relationships 167
- disk drive module 93
- displaying
  - paths 118
- DS CLI
  - console mode installation 16
  - create paths 119
  - creating
    - volume pairs 122, 126
  - default directories 36
  - determining 134
  - ESS machine types 5
  - first time login 36
  - graphical mode installation 13
  - I/O ports 134
  - installation on Linux 16
  - interactive mode 39
  - limitations 7
  - OpenVMS messages 216
  - persistent setup, OpenVMS 32
  - script mode 38
  - session limitation 7
  - silent mode installation 22
  - silent mode installation, DS CLI 22
  - single-shot mode 37
  - upgrade preparation 5
- DS CLI command format 36
- DS CLI commands
  - System i 88
- DS CLI exit codes 42
- DS CLI installation
  - AIX considerations 9
  - default directories 9
  - HP Tru64 considerations 9
  - key aspects 9
  - mounting the installation CD 12

- DS CLI installation (*continued*)
  - System i considerations 9
- DS CLI Tasks
  - Global Mirror
    - add volumes to session 140
    - create FlashCopy relationships 152
    - create Global Copy pairs 151
    - create session 153
    - end a session 155
    - end processing, no script 148
    - end processing, script mode 147
    - modify tuning parameters 141
    - pausing processing 145
    - query Global Mirror session 145
    - remove FlashCopy relationships 156
    - remove Global Copy relationships 157
    - remove paths 158
    - remove volumes 154
    - resume processing 146
    - setup, creating paths 149
    - start processing 146
    - view session 144
  - DS CLI Tasksmodify topology
    - Global Mirror 142
  - DS CLI upgrade, 2105 to DS8000 5
  - dscli command 217

## E

- end Global Mirror script mode 147
- ending Global Mirror processing 162
- exception events 50
- exit codes, obtaining 42
- extent pool modifications, CLI 91
- extent pool names 66
- extent pool, adding ranks with DS CLI 97
- extent pools, delete with DS CLI 93
- extent pools, System i 66

## F

- failback
  - disaster recovery scenario (DS CLI) 132
  - local to remote 545
- failback recovery process 172
- failbackpprc 438
- failover
  - disaster recovery (DS CLI) 132
- failoverpprc 441
- fast reverse restore 169
- fibre-channel I/O ports
  - configuring 76, 87
  - fc-al 76, 87
  - ficon 76, 87
  - scsi-fcp 76, 87
- finding PE package files 523
- finding statesave files 521
- first pass 174
- first time login 36
- fixed block
  - deleting configurations 536

- fixed block configuration error, correcting 73
- fixed block volume
  - creating arrays 67
- fixed block volume groups, creating 73
- fixed block volume groups, modifying 535
- fixed block volumes
  - creating extent pools 66
- fixed block volumes, creating 69
- FlashCopy
  - background copy 113
  - creating a FlashCopy relationship 105
  - deleting relationships 108
  - persistent
    - creating 106
  - refreshing target volumes 110
  - reversing relationship 111
  - reversible option 112
  - reversible option defined 112
  - setflashreversible 112
  - target volumes
    - on Metro Mirror source 115
    - removing write inhibits 114
  - viewing information about FlashCopy relationships 107
- FlashCopy relationships, create 152
- force parameter 438, 441
- freezpprc 455

## G

- Global Copy
  - creating volume pairs 126
- Global Copy failback 177
- Global Copy failover 177
- Global Copy pairs, create 151
- Global Mirror - CLI
  - add volumes to session 140
  - create FlashCopy relationships 152
  - create Global Copy pairs 151
  - create session 153
  - end processing, no script 148
  - end processing, script mode 147
  - end session 155
  - modify topology 142
  - modify tuning parameters 141
  - pausing processing 145
  - query session 145
  - remove FlashCopy relationships 156
  - remove Global Copy pair 157
  - remove paths 158
  - remove volumes 154
  - resume processing 146
  - setup environment, paths 149
  - start processing 146
  - view session 144
- Global Mirror processing, ending 162
- graphical mode installation, DS CLI 13

## H

- help, CLI 40
- HP-UX volume restriction 268

## I

- I/O ports
  - available 134
- i5/OS
  - command format 37
  - green screen, DS CLI 88
  - library QDSCLI 88
  - removing DS CLI directly 532
  - silent mode CLI installation 22
- i5/OS password file directory 228
- IBMDSCCLI\$STARTUP.COM
  - procedure 32
- inband transactions 109, 543
- incremental FlashCopy
  - copying
    - updated tracks only 110
- incrementalresync 451
- installing the CLI 35
- interactive mode
  - history function 39
  - setoutput command 39
- iSeries
  - i5/OS password file directory 228
- issuing
  - DS CLI commands 88
  - i5/OS 88

## J

- JVM not found error 26

## K

- keyboards
  - accessibility features 550

## L

- LCU creation 83
- LCU status 102
- LCU status, one 103
- LCU, modify with CLI 101
- LCUs, deleting 103
- legal
  - terms and conditions 552
- library QDSCLI 88
- limitations
  - remote FlashCopy 109
- Linux
  - DS CLI installation, console mode 16
  - lshostvol command
    - considerations 278
- Linux password file directory 228
- Linux, DS CLI upgrade considerations 5
- lock account 225
- logical control unit creation 83
- logical control unit properties 103
- lsaddressgrp 323
- lsarray 294
- lsarraysite 289
- lsavailpprcport 424
- lsckdvol
  - eam (extent allocation method) 334
  - sam (standard allocation method) 334

- lsddm 240
- lsxtpool 315
- lsfbvol 358
- lsflash 392
- lshostconnect 273
- lshosttype 287
- lshostvol
  - Linux considerations 278
  - OpenVMS considerations 278
- lsioport 259
- lskey 235
- lslcu 326
- lssl 353
- lspe 523
- lsportprof 279
- lspprc 444
- lspprcpath 427
  - command 118
- lsproblem 525
- lsrank 303
- lsremoteflash 412
- lsserver 252
- lssession 485
- lssi 254
  - command 118
- lsss 521
- lsstgencl 237
- lssu 245
- lsuser 228
- lsvolgrp 379
- LUN sizes 364
- LUN volumes, creating 71

## M

- managehostconnect 280
- managepwfile 228
- message types 216
- Metro Mirror
  - consistency groups 123
  - creating
    - volume pairs 122
  - FlashCopy target on Metro Mirror
    - source 115
    - scenario 545
- mkaliasvol 342
- mkarray 298
- mkckdvol 340
- mkesconpprcpath 431
- mkextpool 317
- mkfbvol 364
- mkflash 396
- mkgmir 467
- mkhostconnect 281
- mklcu 328
- mkpe 517
- mkpprc 451
  - volume pairs 122, 126
- mkpprcpath 433
  - creating paths 119
- mkrank 307
- mkremoteflash 415
- mksession 484
- mkuser 231
- mkvolgrp 381
- modify
  - extent pool, CLI 91

- modify a rank, CLI 97
- modify an LCU, CLI 101
- modify topology, CLI 142
- modify tuning parameters, CLI 141
- modifying
  - concurrent copy timeout value (DS CLI) 128
  - consistency group timeout (DS CLI) 128
  - critical mode setting (DS CLI) 129
  - fixed block volume groups 535
  - timeout values (DS CLI) 128
  - z/OS Global Mirror (DS CLI) 129
- mounting the DS CLI installation CD 12
- multiple LCU status 102
- multiple ranks status 99

## N

- nonrevertible 167, 168
- Novell DS CLI graphical installation 13

## O

- offloadauditlog 491
- offloaded statesave files 520
- OpenVMS
  - DS CLI message considerations 216
  - ECOs for installation 27
  - IBMDSCCLI\$STARTUP.COM
    - procedure 32
  - installing CLI 28
  - lshostvol command
    - considerations 278
  - mounting the installation CD 28
  - persistent setup 32
  - Polycenter software installation
    - utility 27
  - preparing for CLI installation 27
- operational limitations 7
- OS/400 DS CLI graphical installation 13
- os400all 75
- os400mask 75
- out-of-sync 174

## P

- password file directories
  - i5/OS 228
  - LINUX 228
  - UNIX 228
  - Windows 228
- paths
  - creating 119
  - deleting 121
  - displaying 118
  - lspprcpath 131
  - mkpprcpath 119
  - port considerations 119
  - view existing 131
- Paths
  - correcting configuration error 120
- pausegmir 469
- pausepprc 457
  - suspending volumes 125
- pe package 517

- pe package files 520
- persistent FlashCopy
  - creating 106
- persistent setup 32
- Polycenter software installation
  - utility 27
- postinstallation
  - CLI 35
- postinstallation tasks 35
- primary volumes 164
- processing tips
  - 3 site recovery 451
  - cascade 451
  - incrementalresync 451
  - multiple volumes 451
  - volume grouping method 451

## Q

- query Global Mirror session 145
- quiesce your system 174

## R

- rank configuration 68, 82
- rank group 1 or 1 82
- rank status, one 99
- rank, create with DS CLI 68
- rank, modify with CLI 97
- ranks status 99
- ranks, deleting 100
- reestablishing remote mirror and copy
  - paths 175
- relationship
  - reversing FlashCopy 111
- release rank, CLI 97
- remote FlashCopy
  - limitations 109
- remote FlashCopy transactions 543
- Remote Mirror and Copy relationships
  - viewing (DS CLI) 133
- remote support
  - contact information 45
  - overview 45
- remove arrays 95
- remove LCUs 103
- remove ranks 100
- removing
  - uncorrupted incremental backup 114
  - write inhibits from FlashCopy target
    - volumes 114
- removing DS CLI, i5/OS 532
- report formats
  - controlling 39
  - default 221
  - delim 221
  - setoutput command 221
  - stanza 221
  - XML 221
- reserve rank, CLI 97
- resume Global Mirror processing 146
- resumegmir 470
- resumepprc 459
  - resuming volumes 124

- resync
  - target volumes in FlashCopy relationship 110
- resyncflash 390
- resynchronize B volumes to A volumes 173
- resyncremoteflash 409
- reverse a FlashCopy relationship 169
- reverseflash 398
- revertflash 401
- revertremoteflash 418
- rmarray 298
- rmckdvol 341
- rmextpool 318
- rmfbvol 366
- rmflash 402
- rmgmir 472
- rmhostconnect 284
- rmlcu 330
- rmpprc 462
- rmpprcpath 435
- rmrank 308
- rmremoteflash 420
- rmsession 490
- rmuser 232
- rmvolgrp 383

## S

- S/390 messages 51
- script mode 38
- script mode, end processing 147
- SCSI host port connections
  - creating 77
- secure shell connection 48
- sendpe 520
- sendss 520
- serial number, obtaining 40
- service action report, console 491
- Service information messages 51
- setcontactinfo 502
- setdialhome 499
- setflashrevertible 405
- setiport 263
- setoutput 221
- setplex 495
- setremoteflashrevertible 422
- setsim 501
- setsmtp 499
- setsnmp 500
- setup, account 51
- showarray 299
- showarraysite 292
- showckdvol 344
- showcontactinfo 514
- showextpool 319
- showfbvol 368
- showgmir 474
- showgmircg 480
- showgmiroos 481
- showhostconnect 285
- showiport 264
- showlcu 331
- showlss 355
- showpass 233
- showplex 496
- showrank 309

- showsi 257
- showsu 247
- showuser 233
- showvolgrp 384
- SIM messages 51
- single volume relationship
  - deleting (DS CLI) 136
- single-shot mode
  - command format, i5/OS 37
  - command format, Windows 37
- SMC pe package 517
- SNMP notifications 50
- stanza report format 221
- starting
  - FlashCopy 113
- status information, fixed block volume 358
- stop the process
  - Global Mirror 472
- storage image ID, obtaining 40
- support operations
  - SNMP notifications 50
- support options, CLI
  - Call Home activation 49
  - e-mail notifications 47
  - SMTP 47
- System i
  - bypassing uninstaller 532
  - CLI installation considerations 9
  - configuring I/O port 76, 87
  - creating
    - FlashCopy relationships 105
    - Global Copy pairs 126
    - Metro Mirror pairs 122
  - DS CLI commands 88
  - extent pool considerations 66
  - host connections 77
  - interactive mode 39
  - issuing 88
  - LUN volumes 71
  - lunmapping 384
  - os400all 75
  - os400mask 75
  - postinstallation tasks 35
  - removing CLI, direct method 532
  - removing CLI, remote method 532
  - script mode 38
  - serial number reporting 257
  - showvolgrp 384
  - single-shot mode 37
  - volume group creation
    - external load source consideration 75
    - multipath consideration 75

## T

- target volume
  - commit changes 117
  - discard changes 116
- FlashCopy
  - commit changes 117
  - discard changes 116
- testcallhome 515
- thaw operation 465, 545
- timeout connection 53

- timeout values
  - modifying
    - concurrent copy (DS CLI) 128
    - consistency group (DS CLI) 128
    - critical mode enabled (DS CLI) 128
    - z/OS Global Mirror (DS CLI) 128
- topology defined, CLI 142
- Trademarks 551
- tuning parameters, CLI 141

## U

- unassign rank, CLI 97
- unattended (silent) mode installation 22
- unattended (silent) mode installation, DS CLI 22
- unfreezeflash 404
- unfreezeprc 465
- uninstall.dat 532
- uninstall.jar 532
- UNIX DS CLI graphical installation 13
- UNIX password file directory 228
- unlock account 225

## V

- ver 236
- view a specific LCU 103
- view a specific rank 99
- view array sites status 94
- view arrays status 94
- view LCU status 102
- view ranks status 99
- view session, CLI 144
- viewing
  - existing paths 131
  - information about FlashCopy relationships 107
  - Remote Mirror and Copy relationships (DS CLI) 133
- volume format processing options 451
- volume pair
  - deleting (DS CLI) 127
- volume removal, CKD 341
- volumes
  - FlashCopy target volumes
    - commit changes 117
    - discard changes 116
- volumes, alias 340

## W

- Windows DS CLI graphical installation 13
- Windows password file directory 228
- write acceleration restriction 7, 451, 467
- write inhibits
  - mkflash command 114
  - removing from FlashCopy target volumes 114
- wwnn
  - displaying
    - for paths 118

## **X**

XML report format 221

## **Z**

z/OS Global Mirror

    modifying

        critical mode setting (DS CLI) 129

        timeout value (DS CLI) 129

zSeries system messages 51







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