

IBM TotalStorage<sup>®</sup> DS6000



# Managing



IBM TotalStorage<sup>®</sup> DS6000



# Managing

**Note:**

Before using this information and the product it supports, read the information in "Notices" on page 81.

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## Tables





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## 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.

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### 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.

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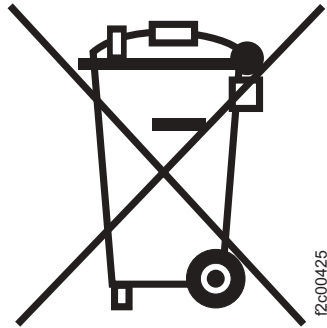
### Environmental notices

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.

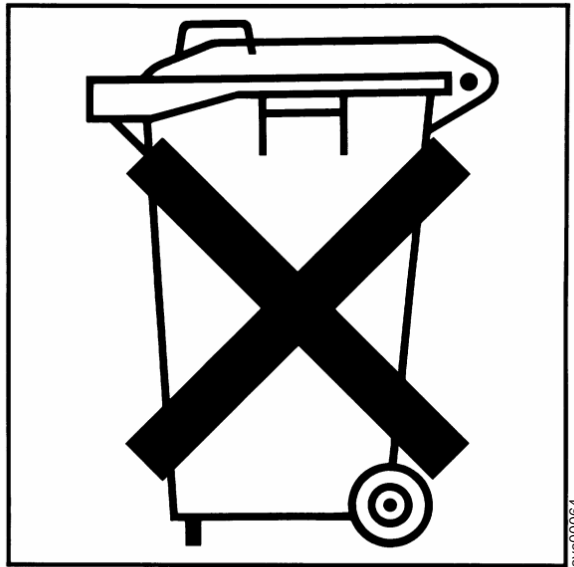
In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as 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/batteryrecycle.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

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## 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:

International Business Machines Corporation  
RCF Processing Department  
Department 61C  
9032 South Rita Road  
TUCSON AZ 85775-4401

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## Chapter 1. Managing

The topics in this section provide information related to managing your DS6000.  
Topics covered include licenses, copy services, configuration, and general storage.



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## Chapter 2. Accessing the DS Storage Manager remotely

The DS6000 can be accessed remotely through the DS Storage Manager using a Web browser from any location that has network access.

To access the DS6000 remotely through the DS Storage Manager, in a browser window, enter one of the following addresses in the Address box.

- For non-secure access, enter `http://IP_address_of_MC:port_ID/DS6000/Console`
- For secure access through Secure Sockets Layer (SSL), enter `https://IP_address_of_MC:SSL_port_ID/DS6000/Console`

**Note:** The default initial port ID is 8451, and the default SSL port ID is 8452. However, when you installed the DS Storage Manager, you were given the option to change the port IDs. If you changed the default port IDs during installation, ensure that you enter the correct port IDs to access the DS6000 remotely.





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## Chapter 3. Getting started with configurations

The information presented here can help you as you begin to work with real-time or simulated configurations.

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, and extent pools from which your logical volumes will be created.

If you plan to use Copy Services features (remote mirror and copy and point-in-time copy<sup>®</sup>), ensure that the license codes for the features that you plan to use are activated. IBM supports a Web interface that is accessible through the IBM home page that allows you to retrieve the license feature code. After you obtain the feature activation codes, you must enter them using the Web-based interface called the IBM System Storage<sup>™</sup> DS Storage Manager.

**Note:** A license feature code is an encrypted value that is installed on each storage unit to enable the licensed feature that is associated with the license code. If you plan to use the remote mirror and copy feature, a separate license is required for each source and target site.

If you plan to implement a remote mirror and copy configuration, you need to define the paths that remote mirror and copy volume pairs will use. Fibre channel is used as the communication link between source and target volumes. Therefore, Fibre Channel Protocol (FCP) connections have to be configured between the storage units.

The following topics will help you get started. You can find links to these topics below.

- [Activating licenses](#)
- [IBM System Storage DS Storage Manager](#)
- [Network configurations](#)
- [Administering](#)
- [Getting started using Copy Services](#)
- [Page help](#)



---

## Chapter 4. Configuration files

The topics in this section provide task information related to working with configuration files. This information is for working with a simulated configuration.

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### Creating a configuration file (simulated only)

Complete this task to create a simulated configuration file.

A simulated configuration file allows you to store management console and logical storage configuration settings to be applied to the DS6000 at a later time. The configuration file contains information for one or more storage units (including both physical and logical) and one or more host systems.

1. In the navigation, select **Simulated manager** → **Manage configuration files**. From the **Select Action** menu, select **Create new...**, and then click **Go** to create a new enterprise file for offline configuration. A default simulated configuration file is available to use if you do not want to create a new file.
2. If you have another file open when you select the **Create new...** action, a message prompts you to save your current work before you create a new file. If you click **Ok** after you receive the message, the new configuration file opens after it is created. If you click **Continue**, you must open the newly created configuration file before you can start working in it.

Once you create a simulated configuration file, you must either import a storage unit instance or create a new storage unit instance from the Create storage unit page.

The configuration file that you create has a default name until you save it using the **Save** action. The default name for the enterprise files is "Enterprise 1," incremented by one for each existing default file name that you do not change.

If you are creating a new logical storage configuration, return to Creating a custom logical storage configuration and complete the rest of the steps.

If you are setting up the DS Storage Manager, return to Setting up the DS Storage Manager and complete the rest of the steps.

---

### Opening configuration files (simulated only)

Complete this task to open an existing enterprise file.

1. In the navigation, select **Simulated manager** → **Manage configuration files**.
2. Select an enterprise file in the table.
3. In the **Select Action** drop-down list, select **Open...**, and then click **Go**.

Within a single open instance of the application, you can have only one configuration document open at a time. When you select another enterprise file in the table and then select **Open...** from the **Select Action** drop-down list, and if you are working on a configuration document that has not recently been saved, a message prompts you to save the current work before opening another document.

---

## Closing configuration files (simulated only)

Complete this task to close an open configuration file.

The Close task closes the current enterprise file and prompts you to save your work.

1. In the navigation, select **Simulated manager** → **Manage configuration files**.
2. Select a configuration in the table.
3. In the **Select Action** drop-down list, select **Close**, and then click **Go**.
4. If an error message appears, click **OK** to save and close the current configuration, and **Continue** to close the configuration without saving it.
5. If you have not yet saved the file, the **Save as** page opens to allow you to enter an alternate name.
6. If you have saved the document at least once, the save function permanently saves the contents with your specified file name.

---

## Saving configuration files as (simulated only)

Complete this task to save configuration files, or save them under a different, user-specified name.

Regardless of which file is currently selected in the Manage files table, the **Save** action saves changes to the open file. When you select **Save** from the **Select Action** drop-down list, you save any changes that you made to the file under the file name. If you have not yet saved the enterprise file, the **Save as...** page opens to allow you to enter an alternate name. If you saved the document at least once, the save function permanently saves the contents to your defined file name.

1. In the navigation, select **Simulated manager** → **Manage configuration files**.
2. Select an item in the table.
3. In the **Select Action** drop-down list, select **Save as....** The **Save As** page is displayed in the work area.
4. Enter the new enterprise configuration file name and, optionally, a description.
5. Click **OK** to complete the process and close the page.

---

## Importing configuration files (simulated only)

Complete this task to import a configuration file.

Use this option to import an XML file containing a configuration that was created on another server.

1. In the navigation, select **Simulated manager** → **Manage configuration files**.
2. In the **Select Action** drop-down list, select **Import**. The **Import** page is displayed.
3. Specify the file to import. You can use the **Browse** button to navigate to the directory that contains the target file.
4. Click **OK** to complete the process and close the page.

---

## Exporting configuration files (simulated only)

Complete this task to export a configuration file.

Use this option to export an XML file containing an enterprise configuration.

1. In the navigation, select **Simulated manager** → **Manage configuration files**.
2. In the **Select Action** drop-down list, select **Export**, and then click **Go**. A **File Download** dialog box appears.
3. In the **File Download** dialog box, click **Save**. A **Save As** window appears.
4. Specify the export location for the file. Navigate to the location that you want the exported .xml file to be saved, and then click **Save**.

---

## Deleting configuration files (simulated only)

Complete this task to delete configuration files.

1. In the navigation, select **Simulated manager** → **Manage configuration files**.
2. Select a configuration in the table.
3. In the **Select Action** drop-down list, select **Delete**. A confirmation dialog is displayed and, if confirmed, deletes the enterprise configuration.
4. Confirm the deletion or select **Cancel** to cancel the process.



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## Chapter 5. Copy Services

This topic provides information to start and later manage your data using Copy Services functions.

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### Getting started with Copy Services

This topic provides information about requirements and guidelines for using the point-in-time copy and remote mirror and copy features of Copy Services.

It is assumed that you have obtained the information that you need to activate the Copy Services licenses using the IBM Disk Storage Feature Activation (DSFA) Web site at: <http://www.ibm.com/storage/dsfa/>. After you obtain the activation keys, it is also assumed that you have entered them in the DS Storage Manager Web interface.

You can use the DS CLI or DS Storage Manager (GUI) to perform Copy Services tasks. An Information Center (an online help system) is provided for browsing and searching online product-related documentation. To use the information center, click the question mark (?) icon that appears in the top right corner of the DS Storage Manager.

**Note:** For a listing of Copy Services commands, see the Command-line interface section of the DS6000 Information Center. For a listing of Copy Services tasks that you can perform from the DS Storage Manager, see the Managing section of the DS6000 Information Center.

The following rules apply when using Copy Services functions:

1. **One or more storage units must be assigned.** Ensure that one or more storage units are configured, assigned, and operating in a normal state. See “Storage Units — Main Page” for more information. The number of required storage units depends on the function. For example, FlashCopy operations require one storage unit, but Metro Mirror and Global Mirror require two.

**Note:** If you plan to use Remote FlashCopy (known as Inband FlashCopy commands on the ESS 2105), two storage units are required for this configuration.

2. **Physical connection must be established between two storage units.** If you plan to use remote mirror and copy functions, such as Metro Mirror, Global Copy or Global Mirror), ensure that a physical connection is established between two storage units. Two (or more) storage units can be connected using a fibre channel direct connection or connect through a switch. To connect the storage units, it is recommended that you have one cable from c0 to c0 and one from c1 to c1, for example, and that you have the proper port topology configuration for those connections. To configure I/O ports, select, in the navigation, **Real-time Manager** → **Storage units** → **Select Action: Configure I/O Ports...** → **Go**.
3. **Logical configuration must be created.** Consider the following requirements:
  - a. **Volume capacity:** Ensure that the capacity of your target volumes is equal to or greater than your source volumes. When you select target volumes

from the DS Storage Manager, it verifies that the capacities of the target volumes are at least as big as the source volumes. It does not allow you to select smaller-sized target volumes.

**Note:** Be aware that for failover and failback operations to complete successfully, the volumes must be the same size and type.

- b. **Volume quantity:** Ensure that you have at least one target volume for each source volume that is of equal or greater capacity than the source volume. You can create up to 256 volumes per LSS.
- c. **Volume sizes:** Capacities of the volume are configured using the following conventions:

**Decimal**

1 GB ( $10^9$ ) = 1,000,000,000 bytes (ESS 2105 volumes are configured in decimal format.)

**Binary**

1 GB ( $2^{30}$ ) = 1,073,741,824 bytes (DS volumes are configured in binary format.)

This method provides volumes that fully use the capacity in every extent.

**Block** 1GB = ( $2^{30}$ ) = 1,073,741,824 (iSeries™ volumes are configured in this format.)

This method supports volume capacity in bytes (512-byte logical blocks). Supported storage sizes range from 1 to 4G blocks (the actual number of gigabytes is the number of blocks times 512).

**Note:** You must consider the gigabyte definitions. In many applications, the source and target of a remote mirror and copy relationship must be exactly the same size. For example, if you plan to use DS6000 and ESS 2105 volumes for remote mirror and copy functions, the volumes on the DS6000 must be created in decimal format to be compatible with ESS volumes.

- d. **Logical subsystem:** You can configure up to 32 LSSs. Each LSS is made up of either CKD or FB volumes. An LSS that consists of CKD addresses requires that other LSSs also be made up of CKD addresses. You can have both CKD and FB LSSs on the same storage unit.

**Note:** CKD LSSs are referred to as LCUs in the DS Storage Manager.

- 4. **Paths must be created:** You must define paths for Metro Mirror, Global Copy, and Global Mirror functions. Fibre channel is used as the communications link between source and target volumes. To create paths, select, in the navigation, **Real-time Manager** → **Copy Services** → **Paths**. From the Select Action drop-down list, select **Create...** and then **Go**. See Creating remote mirror and copy paths for more information.
- 5. **Relationships must be created:** Determine which source and target volumes you wish to pair for Copy Services relationships. To create relationships, select, in the navigation, **Real-time Manager** → **Copy Services** → **select the function (FlashCopy, Metro Mirror, or Global Mirror)**. From the Select Action drop-down list, select **Create...** and then **Go**. See Creating FlashCopy volume pairs or Creating Metro Mirror volume pairs, for example.

**z/OS® Global Mirror limitation:**



If you plan to use z/OS Global Mirror (previously known as Extended Remote Copy or XRC), be aware that a z/OS Global Mirror environment that includes a DS8000 as a primary storage unit and a DS6000 as a secondary storage unit is not recommended for failover and failback operations because of the following limitations:

**Performance mismatch (mirroring)**

If the secondary storage unit (the DS6000) and its connectivity to the System Data Mover (SDM) that runs on z/OS Global Mirror is significantly less capable (lower performing) than the primary storage unit and its connectivity to the application systems, the overall z/OS Global Mirror performance may suffer degraded performance. That is, if applications can write faster to primary storage units than the SDM can write to the secondary storage units, then implementation problems will result. (The SDM is the function that copies data from the primary storage unit to the secondary storage unit in a z/OS Global Mirror environment.)

**Performance mismatch (running applications)**

Suppose a disaster or failure occurs and applications failover to the secondary (or recovery) site and are running using the secondary storage units. If the secondary storage unit (the DS6000) is less capable (performance-wise) than the primary storage unit, it is likely that you will *not* be able to complete primary business applications in the required or expected time frame.

**z/OS Global Mirror-capable local (or primary) storage units**

Suppose a disaster or failure occurs in an z/OS Global Mirror environment and applications failover to the secondary site and are running at the secondary site on the secondary storage units. Later, after the primary site has been repaired and is ready to resume as the primary site, the secondary storage unit can then use z/OS Global Mirror to failback to the primary site. However, for the failover and failback operations to work successfully, the secondary storage unit must be a z/OS Global Mirror-capable primary storage unit, which means it must be capable of being an z/OS Global Mirror primary storage unit. The DS6000 does not have the appropriate microcode functionality to be a z/OS Global Mirror-capable primary storage unit, and therefore cannot be used to failback to the primary site.

**General considerations include:**

- If you plan to issue DS6000 commands, you must have the DS CLI prompt and be connected to a storage unit that will be used for open systems or zSeries® host system storage. The DS CLI helps enable open systems hosts to invoke and manage FlashCopy and remote mirror and copy operations through batch processes and scripts. For more information, see the *IBM System Storage DS6000 Command-Line Interface Guide*.

**Note:** For more complex Copy Services environments, you might find invoking and managing Copy Services functions with the DS CLI is easier. With the DS CLI, you can save commands as scripts, which significantly reduces the time to create, edit, and verify their content.

- When you issue a FlashCopy command with the **Initiate background copy** option enabled, the FlashCopy relationship is established, but put in a queue for background copying. The time that the background copying starts for the specific relationship depends on the number of FlashCopy volumes that have begun background copying or are waiting to begin. When the copy starts, the status displays as "background copy running" for that FlashCopy volume pair.

How long the actual physical copy takes can depend on the amount of data being copied and other activity that is occurring on the storage unit. For information on monitoring when the copy completes, see “Viewing information about FlashCopy relationships” on page 26.

- You should be aware of some FlashCopy data consistency considerations. For example, there are environments where data is stored in server memory cache and written to disk at some later time. Buffers for a database management subsystem (DBMS) or metadata for a journaled file system are two examples of these environments. If a FlashCopy operation copies a source volume to a target volume, but buffers from the DBMS or metadata from the journaled file system are not flushed first, you might have to perform an incremental update. For a DBMS, you might have to back out of current transactions. For a journaled file system, you might have to run the fsck utility on the target volume.

To avoid these types of restart actions, ensure that all data that is related to the FlashCopy source volume has been written to disk before you perform the FlashCopy operation. For a DBMS, you can quiesce the subsystem or use a DBMS command such as DB2's LOG SUSPEND. For a journaled file system, you can unmount the source volume before you perform a FlashCopy operation.

- **For FlashCopy operations:** If you are going to automate your FlashCopy procedures, consider verifying the data consistency on your target volumes frequently. On some systems, such as AIX®, Windows®, and Linux®, before performing FlashCopy operations, you must quiesce your applications that access FlashCopy source volumes. The source volumes must then be unmounted during the FlashCopy establishment. This is to ensure that there is no data in the buffers that could be flushed to the target volumes and potentially corrupt them.
- You can use Global Mirror to create consistent copies of your data at a secondary site, with minimal impact to the local (or primary) site. Global Mirror uses the concept of *sessions* to internally manage data consistency across storage units. You can also use Metro Mirror, Global Copy, and FlashCopy (without Global Mirror) to create data consistency. However, this requires that you use either external automated software or manually suspend your applications at the local site to create consistency at your recovery (or secondary) site.
- The DS Storage Manager can be used for almost all functions for Copy Services. However, you cannot issue the following functions from the DS Storage Manager. They are available only through the DS CLI:

#### **FlashCopy consistency groups**

Consistency group commands allow the storage unit to freeze I/O activity to a LUN or volume until you issue the FlashCopy consistency group command. Consistency groups help create a consistent point-in-time copy across multiple LUNs or volumes, and even across multiple storage units.

#### **Remote FlashCopy (known as Inband FlashCopy commands on the ESS 2105)**

Remote FlashCopy commands are issued to a source volume of a remote mirror and copy volume pair on a local storage unit and sent across paths (acting as a conduit) to a remote storage unit to enable a FlashCopy pair to be established at the remote site. This eliminates the need for a network connection to the remote site solely for the management of FlashCopy.

- If you perform scenarios that call for freeze and run operations for remote mirror and copy operations, you must issue these requests from the command line interface, together with external automated software. These requests are *not* supported by the DS Storage Manager. (Automation software is not provided

with the storage unit; it must be supplied by the user. However, IBM has offerings to assist with this automation. For more information, contact your IBM storage representative.)

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## Adding a Copy Services 2105 domain to a storage complex

Complete this task to set up a Copy Services 2105 domain using the DS Storage Manager.

Copy Services functions are available through the DS Storage Manager that is installed on a management console. The management console is the focal point for configuration and Copy Services functions.

Configuring a Copy Services domain on the DS Storage Manager allows you to perform Copy Services functions between machine type 2105 and machine type 1750. The mirroring solutions are compatible between the 2105 (ESS Models 750 and 800) and 1750.

For this example, assume that you want to configure a 2105 Copy Services domain using the DS Storage Manager. The 1750 must authenticate with the 2105 before you can perform Copy Services functions. Because of the single login process used by the 1750 to access the 2105, the user names and passwords must be the same on the 1750 and 2105. This allows the user to access the 2105 server from the DS Storage Manager, without having to authenticate on the 2105.

Perform the following steps to configure the 2105 Copy Services domain and add it to the list of storage complexes.

1. **Determine the address of the management console.** You need to know the IP address or fully qualified host name of the management console for one of the servers in the Copy Services domain. If you know the address, you can ping the name of the machine. If you do not, see your network administrator. You will be providing this address in Step 3.
2. **Identify the user name and password of that management console.** You need this information to access information from the storage complex. For example, depending on which client application the DS Storage Manager is running (local host or management console), you need the existing user name and password that was created with the ESS Specialist for the 2105 Copy Services domain. The user name and password must match on the management console and 2105 Copy Services domain in order to connect. If they do not match, you must create the user account (in Step 3) that matches the user account on the 2105.

**Note:** The Storage Complex drop-down list will include *local host* as an entry if you installed a DS Storage Manager on your own workstation.

3. **Add a connection for a 2105 Copy Services domain.**
  - a. To add a connection for the 2105 Copy Services domain, expand the **Manage Hardware** section, click **Storage Complexes**, and click **Add 2105 Copy Services Domain** and click **Go**.
  - b. Add the IP address of the 2105 Copy Services IP address and click **OK**. This is the IP address that you identified in Step 1. If the user name and password on the management console and 2105 Copy Services domain match, the status is shown as connected. If they do not match, continue to the following step.

- c. Create a user account that matches the user account from the 2105 Copy Services domain. To do this, expand the **Monitor System** section, click **User Administration**, and click **Add user**.
- d. From the **Add user** page, enter the user name and a temporary password. You are asked which access or group assignment that you want to assign the user. For this example, select the Copy Services group to allow the user to manage Copy Services relationships.

**Copy Services operator**

Performs Copy Services functions

- e. Logout from the DS Storage Manager
- f. Log back into the DS Storage Manager using the user name that matches the user account from the 2105. Then, change the password to match the password on the 2105 Copy Services domain. You can now create Copy Services relationships between the 2105 and 1750.

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## FlashCopy

This section contains a list of DS Storage Manager tasks that help you create, monitor, and manage your FlashCopy operations.

### Applying the FlashCopy Revertible option to existing FlashCopy relationships

Complete this task to apply the FlashCopy Revertible option 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 apply the FlashCopy Revertible option to a FlashCopy relationship that is already revertible.

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 using this task. It is not valid to perform the FlashCopy Revertible task on a FlashCopy relationship that is already 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. You can apply the FlashCopy Revertible option with this DS Storage Manager task in a Global Mirror configuration to modify an existing FlashCopy relationship with the persistent, change recording, target write inhibit, and no copy options enabled. This DS Storage Manager task allows you, under certain conditions during failure recovery, to correct an inconsistency in the FlashCopy consistency group target volumes by discarding or committing the changes to a target volume in a FlashCopy relationship.

The FlashCopy Revertible task restarts an existing FlashCopy volume pair with the revertible option enabled for disaster recovery purposes. 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.

Perform the following step to apply the FlashCopy Revertible option to existing FlashCopy relationships:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **FlashCopy**. A list of FlashCopy volume pairs is displayed. Select one or more FlashCopy pairs on which to perform an action.
2. Select **FlashCopy Revertible** from the **Select Action** drop-down menu. Click **Go**.
3. The FlashCopy Revertible: Select common options page is displayed. You must select whether to enable or disable the **Permit FlashCopy to occur if target volume is online for host access** option. The rest of the options cannot be changed. The **Make relationship(s) persistent** and **Enable change recording** options are automatically selected and the **Initiate background copy** and **Establish target on existing Metro Mirror source** options are automatically not selected. Click **Next**.
4. The FlashCopy Revertible: Select advanced options page is displayed. You can enter a value only in the sequence number field. The rest of the options cannot be changed. The **Inhibit writes to source volume**, **Inhibit writes to target volume** and **Allow target to be restored to pre-FlashCopy state** options are automatically selected. Click **Next**.
5. Verify your options, and when you have finished, click **Finish** to complete the task, or click **Cancel** to exit without performing the task. The FlashCopy main page is displayed.

## 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 if you have modified the FlashCopy relationship using the **FlashCopy Revertible** action and have selected the **Allow target to be restored to pre-FlashCopy state** option, which changes the Restorable property value to Yes.

If a FlashCopy consistency group formation operation does not complete, the consistency groups at the remote site might be only partially formed. You must verify the consistency group on 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 that reverting to the previous consistency group state is no longer possible.

Perform the following steps to commit data to FlashCopy target volumes:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **FlashCopy**. A list of FlashCopy volumes is displayed. Select one or more volumes on which to perform an action.
2. On the FlashCopy main page, select the target volumes from the table that you want to commit changes to and select **Commit changes** from the **Select Action** drop-down menu.
3. Click **Go**. The Commit Changes — Confirm page is displayed. This page displays the relationships on which the changes will be committed.
4. Select **OK** to confirm that you want to commit updates to the target volumes, or click **Cancel** to exit without performing the task. The FlashCopy main page is displayed.



## 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.

When you create FlashCopy relationships between source and target volumes, the size of the target volumes must be equal or greater than the size of the corresponding source volumes. Any mismatch causes the task to fail.

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 actual physical copy processing takes can depend on the amount of data being copied and other activities that are occurring on the storage unit.

Perform the following steps to create a FlashCopy relationship between a source and target volume:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **FlashCopy**. All storage complexes that are listed in the drop-down menu are based on the storage complexes that you added during the configuration process. If you have added a 2105 Copy Services domain, it is listed as a storage complex. All relationships that are displayed can be either source or target volumes from the selected domain.
2. Select **Create...** from the **Select Action** drop-down menu, and click **Go**.
3. Select the type of relationship to create (single source volume with a single target or single source volume with multiple targets), and click **Next**.
4. On the Select source volumes page, select the source volumes for the FlashCopy relationships, and click **Next**.
5. On the Select target volumes page, select your target volumes. You can change the LSS from the Resource type drop-down menu to select target volumes. For single source and target volume selections, you must select the same number of target volumes as you did source volumes.
6. When you have finished selecting your target volumes, click **Next**.
7. On the Select common options page, select any (or none) of the following copy options, and click **Next**.
  - **Initiate background copy** copies all tracks from the source to the target volume as a background task.
  - **Enable change recording** and **Make relationship persistent** allow a relationship to be refreshed later. If you click **Enable change recording**, **Make relationship persistent** is automatically selected.

- The **Permit FlashCopy to occur if target volume is online for host access** allows the target volume to be online for host system access. This parameter applies only to count key data volumes.
  - The **Establish target on existing Metro Mirror source** allows the FlashCopy target volume to be a remote mirror and copy source volume.
  - The **Sequence number for these relationships** is used for Global Mirror functions.
8. On the Verification page, review the attributes and values that you selected to verify that they are correct.
  9. If the attributes and values are not correct, click **Back** as appropriate to return and then specify the correct values. Otherwise, click **Finish** to complete the create FlashCopy relationship task.

**Note:** You can monitor when the copy processing completes by viewing the **Properties** selection from the FlashCopy action drop-down menu.

## 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.

The **Establish target on existing Metro Mirror source** option takes a point-in-time copy of a volume and makes a copy at a remote site. This option is available as a check box both on the **Create FlashCopy relationship — Select common options** wizard page and on the **Resync FlashCopy** page.

- Perform these steps during FlashCopy creation:
  1. In the navigation, select **Real-time Manager Copy Services FlashCopy**. A list of FlashCopy volumes is displayed.
  2. Select **Create...** from the **Select Action** drop-down menu and click **Go**.
  3. Select the type of relationship to create (single source volume with a single target or single source volume with multiple targets), and click **Next**.
  4. On the Select source volumes page, select the source volumes for the FlashCopy relationships, and click **Next**.
  5. On the Select target volumes page, select your target volumes.
  6. When you have finished selecting your target volumes, click **Next**.
  7. On the Select common options page, select the **Establish target on existing Metro Mirror source** option.
  8. Review the options, and click **OK** to proceed.
- Perform these steps during Resynch FlashCopy processing:
  1. In the navigation, select **Real-time Manager → Copy Services → FlashCopy**. A list of FlashCopy volumes is displayed.
  2. Click on one or more FlashCopy volume pairs on which to establish FlashCopy targets on a Metro Mirror source volume.
  3. On the FlashCopy main page, click on the **Resync FlashCopy** action from the **Select Action** drop-down menu. Click **Go**. The Resynch FlashCopy page is displayed.
  4. Select the **Establish target on existing Metro Mirror source** option.
  5. Review the options and click **OK** to continue.

**Note:** By default, when you issue a **Resync FlashCopy** action to a FlashCopy relationship, this action acts as an incremental FlashCopy relationship. This means that if you created the FlashCopy relationship with the Change Recording and Persistent options, the volume pair is synchronized and a record of all host write operations to the source is maintained in the source volumes. Afterwards, you when issue the **Resync FlashCopy** action to the same FlashCopy relationship, only the new write operations to the source are copied to the target. This minimizes the data that is copied to the remote site when you use the **Establish target on existing Metro Mirror source** option.

## 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 steps to create a persistent FlashCopy relationship between a source volume and target volume.

1. In the navigation, select **Real-time Manager** → **Copy Services** → **FlashCopy**.
2. Select **Create...** from the **Select Action** drop-down menu, and click **Go**. All storage complexes that are listed in the drop-down list are based on the storage complexes that you added during the configuration process. You can change which storage complex or resource type from which to select volumes. All relationships that are displayed can be source or target volumes from the selected domains.
3. Select the type of relationship to create (single source volume with a single target or single source volume with multiple target volumes), and click **Next**.
4. On the Select source volumes page, select the source volumes for the FlashCopy relationships, and click **Next**.
5. On the Select target volumes page, select your target volumes and click **Next**.
6. After you have selected your target volumes, click **Next**.
7. On the Select common options page, select the **Make relationships persistent** option, and click **Next**. Optionally, you can click the following options:
  - **Initiate background copy** copies all tracks from the source to the target volume as a background task.
  - **Enable change recording** and **Make relationship persistent** allow a relationship to be refreshed later. If you click **Enable change recording**, **Make relationship persistent** is automatically selected.
  - The **Permit FlashCopy to occur if target volume is online for host access** allows the target volume to be online for host system access. This parameter applies only to count key data volumes.
  - **Establish target on existing Metro Mirror source** allows the FlashCopy target volume to be a remote mirror and copy source volume.
  - **Sequence number for these relationships** is used for Global Mirror functions.
8. On the Verification page, review the attributes and values that you selected to verify that they are correct.



9. If the attributes and values are not correct, click **Back** to return through the selections, and specify the correct values. Otherwise, click **Finish** to complete the FlashCopy relationship task.

## 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 the 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.

Perform the following steps to create 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.2107-1300861/0001) from LSS22 and volume 2A00 (IBM.2107-1300871/0001) 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. You must use the DS CLI for this step (see Processing Remote FlashCopy [inband] transactions in the *IBM System Storage DS6000 Command-Line Interface User's Guide* for additional information).

## Creating multiple data copies using a single source volume

Complete this task to create multiple data copies of a single source volume.

If you require multiple copies of the same data, you can copy a single source volume multiple (up to twelve) times to different target volumes, without waiting for the previous relationship to end.

Perform the following steps to create multiple data copies using a single source FlashCopy volume:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **FlashCopy**.
2. Select **Create...** from the **Select Action** drop-down menu, and click **Go**.
3. Select the **A single source volume with multiple targets** option, and click **Next**.
4. On the Select target volumes page, select your target volumes (for the 1:n relationship between source and target). The nickname of the source volume is displayed. The default resource type for target volume selection is the same as the associated source volume. Ensure that the capacity of target volumes that you select is either the same size or larger than the selected source volume.
5. After you have selected your target volumes, click **Next**.
6. On the Select common options page, select the copy options for the FlashCopy volume pairs, and click **Next**.
  - Optionally, you can click the **Initiate background copy** button to copy all tracks from the source to the target volume as a background task.
  - Optionally, you can click the **Enable change recording** and **Make relationship persistent** buttons to allow a relationship to be refreshed later. If you click **Enable change recording**, **Make relationship persistent** is automatically selected.
7. On the Verification page, review the attributes and values that you have selected to verify that they are correct.
8. If the attributes and values are not correct, click **Back** to return through the selections and specify the correct values. Otherwise, click **Finish** to complete the multiple FlashCopy relationship task.

## Deleting FlashCopy relationships

Complete this task to delete FlashCopy relationships between a source volume and target volume.

Deleting FlashCopy relationships between volume pairs ends a FlashCopy operation. All the data on the target volume can become corrupted and unusable if another application inadvertently writes to it. You can delete a FlashCopy relationship only if one of the following conditions is true:

- The FlashCopy operation was performed without a background copy.
- The FlashCopy operation was performed without a background copy and you need to create an immediate copy of the source volume.
- There is no longer a requirement for the FlashCopy relationship.

**Note:** A source volume can be in more than one FlashCopy relationship at the same time. If a volume is already in a FlashCopy relationship, you can delete the relationship before the background copy completes.

Perform the following steps to delete FlashCopy relationships:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **FlashCopy**. A list of FlashCopy volumes is displayed. You must have created a FlashCopy relationship and it must be listed in the table before you can delete it. From the table, Select the FlashCopy relationship that you want to delete.
2. On the FlashCopy main page, select **Delete** from the **Select Action** drop-down menu. Click **Go**. The following warning message is displayed: "CMUS00000W This operation deletes the selected FlashCopy relationships. Click OK to delete the FlashCopy relationships. Click Cancel to cancel the operation."

3. To confirm, click the **OK** button and the selected FlashCopy relationships are deleted, or click **Cancel** to exit without performing the task. The FlashCopy main page is displayed.

## 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 **FlashCopy Reversible** action and have selected the **Allow target to be restored to pre-FlashCopy state** option, which changes the Restorable property value to Yes.

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 committing changes is no longer possible.

Perform the following steps to discard changes to FlashCopy target volumes:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **FlashCopy**. A list of FlashCopy volumes is displayed.
2. On the FlashCopy main page, select the FlashCopy relationships from which you want to discard changes to the target volume, and select **Discard Changes** from the **Select Action** drop-down menu.
3. Click **Go**. The Discard Changes — Confirm page is displayed. This page lists the relationships from which you want to discard changes.
4. Select **OK** to confirm that you want to discard changes to the target volumes, or click **Cancel** to exit without performing the task. The FlashCopy main page is displayed.

## Providing data consistency using FlashCopy consistency groups

You can establish a consistency group by using the freeze option of the mkflash and resyncflash DS CLI commands. This function ensures consistency between multiple FlashCopy volumes.

For information, see the mkflash and resyncflash DS CLI commands. The establish consistency groups for FlashCopy function (freeze option of FlashCopy commands) is not supported using the DS Storage Manager.

## Starting a background copy of a FlashCopy relationship

Complete this task to start a background copy of a FlashCopy volume pair that allows data to be copied from the source volume to the target volume.

When you issue a FlashCopy command with the **Initiate background copy** option, 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 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 viewing the Properties selection from the FlashCopy action pull-down menu.

Perform the following steps to start a background copy of a FlashCopy relationship between a source volume and target volume.

1. In the navigation, select **Real-time Manager** → **Copy Services** → **FlashCopy**. A list of FlashCopy volumes is displayed. Select one or more volumes on which to perform an action.
2. On the FlashCopy main page, select **Initiate background copy** from the **Select Action** drop-down menu. Click **Go**. The Initiate background copy page is displayed.
3. On the Initiate background copy page, confirm the FlashCopy relationships on which the background copy will run. If the source volume has multiple targets, the relationships are selected together and the background copy is started on all relationships.
4. Select the FlashCopy relationships, and click **OK** to complete the task, or click **Cancel** to exit without performing the task. The FlashCopy main page is displayed.

## Resynchronizing a FlashCopy relationship

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.

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.

Perform the following steps to resynchronize a FlashCopy relationship between a source volume and target volume:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **FlashCopy**. A list of FlashCopy volume pairs is displayed. Select one or more FlashCopy pair on which to perform an action.

**Note:** All storage complexes that are listed in the drop-down list are based on the storage complexes that were added during the configuration process.

If you added a 2105 Copy Services domain, it is listed as a storage complex. All relationships that are displayed can be source or target volumes from the selected domain.

2. Select **Resync target** from the **Select Action** drop-down list. Click **Go**.
3. Select the copy options for the FlashCopy target volumes that will be resynchronized after data is copied from the source volumes. You must select whether to enable or disable the **Enable change recording**, **Permit FlashCopy to occur if target volume is online for host access**, and **Inhibit writes to target volume** options.
4. When you have finished selecting your options, click **OK** to complete the task, or click **Cancel** to exit without performing the task. The FlashCopy main page is displayed.

## 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.

When you select the **Inhibit writes to target** option to prevent host write operations on the target volume, 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 the **Resync FlashCopy** action is issued, the FlashCopy relationship is established to act as an incremental FlashCopy. In addition, by default, when you issue the **FlashCopy Revertible** action to the 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. (The **FlashCopy Revertible** option was previously called the **Record Changes** option.)

Perform the following steps to prevent write operations on FlashCopy target volumes:

1. In the navigation, select **Real-time Manager** → **Copy ServicesFlashCopy**. A list of FlashCopy volumes is displayed.
2. Select one or more FlashCopy volume pairs to prevent write operations to the associated FlashCopy target volumes.
3. On the FlashCopy main page, select **Resync FlashCopy** from the **Select Action** drop-down list. Click **Go**. The Create new FlashCopy — Resync FlashCopy page is displayed.
4. Select "Enable all" for the **Inhibit writes to target volume** option.
5. Review the options and select the **OK** button to continue.

## Resetting FlashCopy consistency groups

The unfreezeflash DS CLI command resets an existing FlashCopy consistency group that was previously established when the mkflash or resyncflash DS CLI command was issued using the freeze option. The unfreezeflash command resets the consistency group of all FlashCopy volumes that was established or resynchronized using the freeze option.

For information, see the unfreezeflash DS CLI command. The resetting FlashCopy consistency groups function (unfreezeflash DS CLI command) is not supported using the DS Storage Manager.

## 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 Reverse option of the **Reverse relationship** task before the background copy process completes to reverse the direction of the FlashCopy volume pair.

Perform the following steps to reverse a FlashCopy relationship between a source volume and target volume.

1. In the navigation, select **Real-time Manager** → **Copy Services** → **FlashCopy**. A page containing a list of FlashCopy volume pairs is displayed. Select one or more volume pairs on which to perform an action.
2. Select **Reverse relationship** from the **Select Action** drop-down menu. Click **Go**.
3. Select the copy options for the FlashCopy relationships. You must select whether to enable or disable the **Enable change recording**, **Permit FlashCopy to occur if target volume is online for host access**, **Inhibit writes to target volume**, and **Fast Reverse** options.
4. When you have finished selecting your options, click **OK** to complete the task, or click **Cancel** to exit without performing the task. The FlashCopy main page is displayed.

## Viewing information about FlashCopy relationships

Complete this task to view status information about each existing FlashCopy relationship.

Perform the following steps to view information about FlashCopy relationships:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **FlashCopy**. A list of FlashCopy volumes is displayed. Select one or more volumes on which to perform an action.
2. Select **Properties** from the **Select Action** drop-down menu and click **Go**, or click the source volume nickname link. The FlashCopy Properties page is displayed where you can view general properties or information about the number of "out-of-sync" (not yet copied) tracks of the FlashCopy volume pair.
3. Select the **Out-of-sync-tracks** tab and click the **Refresh Interval** drop-down menu to select how often to refresh the display of the number of "out-of-sync" tracks. Click **OK**.



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## Global Mirror

This topic provides information to help you get started using Global Mirror functions. Global Mirror asynchronously copies data from a host to a remote site, and maintains data on a storage unit at the remote site.

### Adding volumes to a Global Mirror session

Complete this task to add volumes to an existing Global Mirror session by modifying the session properties.

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 volume which, for example, is converted from Global Copy to Metro Mirror, the formation of a 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:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Global Mirror**. A page containing a list of volumes. Select one or more volumes on which to perform an action.
2. In Global Mirror — Main Page, select **Modify** from the **Select Action** drop-down list. Then click **Go**. The Modify Global Mirror — Select volumes page is displayed. The volumes that are currently part of this session are already selected.
3. Accept or modify the selected storage complex from the **Select storage complex** drop-down list.
4. Accept or modify the selected volumes from the **Select volumes** navigation. The volumes that you selected appear in the **Selected volumes** list.
  - a. Optionally, you can click the **Create FlashCopy** button to create a new FlashCopy relationship. After you create the FlashCopy relationship and the table resets, the new valid volumes are available for selection.
  - b. Optionally, you can click the **Create Metro Mirror** button to create a new Metro Mirror relationship. After you create the Metro Mirror relationship and the table resets, the new valid volumes are available for selection.
5. When you have finished selecting your volumes, click **Next**. The Modify Global Mirror — Define Global Mirror properties page is displayed.
6. Accept or modify the properties, and then click **Next**. The Modify Global Mirror — Select subordinates page is displayed.
7. After selecting the subordinates, click **Next**. The Modify Global Mirror — Verification page is displayed.
8. In Modify Global Mirror — Verification, review the attributes and values to verify that they are correct.
9. If the attributes and values are not correct, click **Back** as appropriate to return to the page where you want to make changes, and then specify the correct values. Otherwise, click **Finish** to complete the volume group creation process.

## Creating a new Global Mirror session

Complete this task to create a new Global Mirror session.

Global Mirror supports data consistency across multiple volumes, multiple LSSs, and multiple storage units using sessions. A session is a collection of volumes that are managed together during the creation of consistent copies of data.

Use the following rules to create sessions:

- An LSS can only be assigned to one session.
- A Global Mirror master storage unit coordinates the consistency group that is identified by a single session ID.
- The administrator is responsible for correctly defining sessions and managing the volumes within that session.
- A maximum of eight storage units are allowed per session.

Perform the following steps to create a new Global Mirror session:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Global Mirror**.
2. On the Global Mirror — Main Page, the following selection are required before selecting any volumes:
  - a. Select a storage complex from the **Storage complex** drop-down list.
  - b. Select a storage unit from the **Storage unit** drop-down list.
3. Select **Create** from the **Select Action** drop-down list. Then click **Go**. If an existing Global Mirror session does not exist, there are no check boxes to select and the pull-down list only allows for session creation. The Create new Global Mirror session — Select volumes page is displayed.
4. Select the volumes that you want to add to the session from the **Select volumes** navigation. The volumes that you selected appear in the **Selected volumes** list.
  - a. Optionally, you can click the **Create FlashCopy** button to create a new FlashCopy relationship. After you create the FlashCopy relationship and the table resets, the new valid volumes are available for selection.
  - b. Optionally, you can click the **Create Metro Mirror** button to create a new Metro Mirror relationship. After you create the Metro Mirror relationship and the table resets, the new valid volumes are available for selection.
5. When you have finished selecting your volumes, click **Next**. The Create Global Mirror — Define properties page is displayed.
6. In Create Global Mirror — Define properties, specify the session number in the **Enter session number** field.

**Note:** The session number consists of two hexadecimal characters ranging from 01 - FF (1-255 in decimal). This number is unique across the enterprise and uniquely identifies the Global Mirror session.

7. Specify the storage complex for the master LSS in the **Select master LSS** field.
8. Optionally, specify the consistency group interval time in **Consistency group interval time**. This value indicates how long (in seconds) you must wait between the formation of consistency groups. If the value is set to zero, the consistency group is formed continuously. The default value is 0. The maximum value is 65535 seconds.
9. Optionally, specify the maximum coordination interval in **Maximum coordination interval**. This value indicates the maximum time (in



- milliseconds) that the primary host I/O is paused to form a consistency group. The default value is 50. The maximum value is 65535 milliseconds.
10. Optionally, specify the maximum time writes are inhibited to the remote site before stopping the current consistency group in **Maximum time writes inhibited to remote site**. This value indicates the maximum amount of time (in seconds) that writes are inhibited to the remote site before stopping the current consistency group. The default value is 30 seconds.
  11. Click **Next**. The Create Global Mirror — Verification page is displayed.
  12. In Create Global Mirror — Verification, review the attributes and values to verify that they are correct.
  13. If the attributes and values are not correct, click **Back** as appropriate to return to the page where you want to make changes and then specify the correct values. Otherwise, click **Finish** to complete the Global Mirror session creation process.

## Deleting a Global Mirror session

Complete this task to delete a Global Mirror session.

You must stop Global Mirror processing before you can delete the Global Mirror session. When you delete a Global Mirror session, all of the volumes are removed from the session and the instance of the session no longer exists.

Perform the following steps to delete a Global Mirror session:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Global Mirror**. A page containing a list of sessions displays. Select one or more on which to perform an action.
2. In Global Mirror — Main Page, and select **Delete** from the **Select Action** drop-down list. Then click **Go**.
3. A confirmation box is displayed. Confirm the action to delete the session.

## Modifying a Global Mirror session

Complete this task to modify an existing Global Mirror session by modifying the session properties.

### Note:

- You must pause the Global Mirror session before making any modifications.
- If you are using DS CLI, query the Global Mirror processing status after you pause the processing.

Global Mirror supports data consistency across multiple volumes, multiple LSSs, and multiple storage units using sessions. A session is a collection of volumes that are managed together during the creation of consistent copies of data. Use the following rules to create sessions:

- An LSS can only be assigned to one session.
- A Global Mirror master storage unit coordinates the consistency group that is identified by a single session ID.
- You are responsible for correctly defining sessions and managing the volumes within that session.
- A maximum of eight storage units are allowed per session.

Perform the following steps to modify the properties of a Global Mirror session:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Global Mirror**. A page containing a list of sessions displays. Select one or more sessions on which to perform an action.
2. On the Global Mirror — Main page, select **Modify** from the **Select Action** drop-down list. Then click **Go**. The Modify Global Mirror — Select volumes page is displayed.
3. From the Modify Global Mirror — Select volumes page, accept or modify the selected storage complex from the **Select storage complex** drop-down list.
4. Accept or modify the selected volumes from the **Select volumes** navigation. The volumes that you selected appear in the **Selected volumes** list.
  - a. Optionally, you can click the **Create FlashCopy** button to create a new FlashCopy relationship. After you create the FlashCopy relationship and the table resets, the new valid volumes are available for selection.
  - b. Optionally, you can click the **Create Metro Mirror** button to create a new Metro Mirror relationship. After you create the Metro Mirror relationship and the table resets, the new valid volumes are available for selection.
5. When you have finished selecting your volumes, click **Next**. The Modify Global Mirror — Define Global Mirror properties page is displayed.
6. Accept or modify the session number in the **Enter session number** field.

**Note:** The session number consists of two hexadecimal characters ranging from 01 - FF (1-255 in decimal). This number is unique across the enterprise and uniquely identifies the session.

7. Accept or modify the storage complex for the master LSS in the **Select storage complex for master LSS** field.
8. Optionally, specify the master LSS in **Select master LSS**.

**Note:** The master LSSs that are available for selection depend on what you specified for **Select storage complex for master LSS**.

9. Optionally, specify the consistency group interval time in **Consistency group interval time**. This value indicates how long (in seconds) you must wait between the formation of consistency groups. If the value is set to zero, the consistency group is formed continuously. The default value is 0. The maximum value is 65 535 seconds.
10. Optionally, specify the maximum coordination interval in **Maximum coordination interval**. This value indicates the maximum time (in milliseconds) that XDC pauses the primary host I/O to form a consistency group. The default value is 50. The maximum value is 65 535 milliseconds.
11. Optionally, specify the maximum time writes are inhibited to the remote site before stopping the current consistency group in **Maximum time writes inhibited to remote site**. This value indicates the maximum amount of time (in seconds) that writes are inhibited to the remote site before stopping the current consistency group. The default value is 30.
12. Click **Next**. The Modify Global Mirror — Select subordinates page is displayed.
13. Accept or modify the selected subordinates. The subordinates that you selected appear in the **Selected subordinates** list.

**Note:** In a single session, you can only select one subordinate per storage unit that is not the master storage unit. Subordinate storage units and LSSs are limited to those storage units that have paths from the master LSS.

14. Optionally, you can click the **Create path** button to create a new path. After you create the Metro Mirror relationship and the table resets, the new valid subordinates are available for selection.
15. Click **Next**. The Modify Global Mirror — Verification page is displayed.
16. In Modify Global Mirror — Verification, review the attributes and values to verify that they are correct.
17. If the attributes and values are not correct, click **Back** as appropriate to return to the page where you want to make changes and then specify the correct values. Otherwise, click **Finish**.

## Modifying the consistency group interval time

Complete this task to modify the consistency group interval time. The consistency group interval time indicates how long (in seconds) you must wait between the formation of consistency groups.

### Note:

- You must pause the Global Mirror session before making any modifications.
- If you are using DS CLI, query the Global Mirror processing status after you pause the processing.

If the value of the consistency group interval time is set to zero, the consistency group is formed continuously. The default value is 0. The maximum value is 65535 seconds.

Perform the following steps to modify the consistency group interval time:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Global Mirror**. A page containing a list of sessions displays. Select one or more sessions on which to perform an action.
2. On the Global Mirror — Main page, select **Modify** from the **Select Action** drop-down list. Then click **Go**. The Modify Global Mirror — Select volumes page is displayed.
3. From the Modify Global Mirror — Select volumes page, accept or modify the selected storage complex from the **Select storage complex** drop-down list.
4. Accept or modify the selected volumes from the **Select volumes** navigation. The volumes that you selected appear in the **Selected volumes** list.
  - a. Optionally, you can click the **Create FlashCopy** button to create a new FlashCopy relationship. After you create the FlashCopy relationship and the table resets, the new valid volumes are available for selection.
  - b. Optionally, you can click the **Create Metro Mirror** button to create a new Metro Mirror relationship. After you create the Metro Mirror relationship and the table resets, the new valid volumes are available for selection.
5. When you have finished selecting your volumes, click **Next**. The Modify Global Mirror — Define Global Mirror properties page is displayed.
6. Accept or modify the session number in the **Enter session number** field.

**Note:** The session number consists of two hexadecimal characters ranging from 01 - FF (1-255 in decimal). This number is unique across the enterprise and uniquely identifies the session.

7. Accept or modify the storage complex for the master LSS in the **Select storage complex for master LSS** field.
8. Optionally, specify the master LSS in **Select master LSS**.

**Note:** The master LSSs that are available for selection depend on what you specified for **Select storage complex for master LSS**.

9. Optionally, specify the consistency group interval time in **Consistency group interval time**. This value indicates how long (in seconds) you must wait between the formation of consistency groups. If the value is set to zero, the consistency group is formed continuously. The default value is 0. The maximum value is 65535 seconds.
10. Optionally, specify the maximum coordination interval in **Maximum coordination interval**. This value indicates the maximum time (in milliseconds) that XDC pauses the primary host I/O to form a consistency group. The default value is 50. The maximum value is 65535 milliseconds.
11. Specify the maximum time writes are inhibited to the remote site before stopping the current consistency group in **Maximum time writes inhibited to remote site**. This value indicates the maximum amount of time (in seconds) that writes are inhibited to the remote site before stopping the current consistency group. The default value is 30 seconds. This field is optional.
12. Click **Next**. The Modify Global Mirror — Select subordinates page is displayed.
13. Accept or modify the selected subordinates. The subordinates that you selected appear in the **Selected subordinates** list.

**Note:** In a single session, you can only select one subordinate per storage unit that is not the master storage unit. Subordinate storage units and LSSs are limited to those storage units that have paths from the master LSS.

14. Optionally, you can click the **Create path** button to create a new path. After you create the Metro Mirror relationship and the table resets, the new valid subordinates are available for selection.
15. Click **Next**. The Modify Global Mirror — Verification page is displayed.
16. In Modify Global Mirror — Verification, review the attributes and values to verify that they are correct.
17. If the attributes and values are not correct, click **Back** as appropriate to return to the page where you want to make changes and then specify the correct values. Otherwise, click **Finish**.

## Modifying the maximum time writes are inhibited to the remote site

Complete the task to modify the maximum time writes that are prohibited to the remote site.

**Note:**

- You must pause the Global Mirror session before making any modifications.
- If you are using DS CLI, query the Global Mirror processing status after you pause the processing.

The maximum time writes are inhibited to the remote site indicates the maximum amount of time (in seconds) that writes are inhibited to the remote site before stopping the current consistency group. The default value is 30 seconds.

Perform the following steps to modify the consistency group interval time:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Global Mirror**. A page containing a list of sessions displays. Select one or more sessions on which to perform an action.
2. On the Global Mirror — Main page, select **Modify** from the **Select Action** drop-down list. Then click **Go**. The Modify Global Mirror — Select volumes page is displayed.
3. From the Modify Global Mirror — Select volumes page, accept or modify the selected storage complex from the **Select storage complex** drop-down list.
4. Accept or modify the selected volumes from the **Select volumes** navigation. The volumes that you selected appear in the **Selected volumes** list.
  - a. Optionally, you can click the **Create FlashCopy** button to create a new FlashCopy relationship. After you create the FlashCopy relationship and the table resets, the new valid volumes are available for selection.
  - b. Optionally, you can click the **Create Metro Mirror** button to create a new Metro Mirror relationship. After you create the Metro Mirror relationship and the table resets, the new valid volumes are available for selection.
5. When you have finished selecting your volumes, click **Next**. The Modify Global Mirror — Define Global Mirror properties page is displayed.
6. Accept or modify the session number in the **Enter session number** field.

**Note:** The session number consists of two hexadecimal characters ranging from 01 - FF (1-255 in decimal). This number is unique across the enterprise and uniquely identifies the session.

7. Accept or modify the storage complex for the master LSS in the **Select storage complex for master LSS** field.
8. Optionally, specify the master LSS in **Select master LSS**.

**Note:** The master LSSs that are available for selection depend on what you specified for **Select storage complex for master LSS**.

9. Optionally, specify the consistency group interval time in **Consistency group interval time**. This value indicates how long (in seconds) you must wait between the formation of consistency groups. If the value is set to zero, the consistency group is formed continuously. The default value is 0. The maximum value is 65535 seconds.
10. Optionally, specify the maximum coordination interval in **Maximum coordination interval**. This value indicates the maximum time (in milliseconds) that the primary host I/O is paused to form a consistency group. The default value is 50. The maximum value is 65535 milliseconds.
11. Specify the maximum time writes are inhibited to the remote site before stopping the current consistency group in **Maximum time writes inhibited to remote site**. This value indicates the maximum amount of time (in seconds) that writes are inhibited to the remote site before stopping the current consistency group. The default value is 30 seconds. This field is optional.
12. Click **Next**. The Modify Global Mirror — Select subordinates page is displayed.
13. Accept or modify the selected subordinates. The subordinates that you selected appear in the **Selected subordinates** list.

**Note:** In a single session, you can only select one subordinate per storage unit that is not the master storage unit. Subordinate storage units and LSSs are limited to those storage units that have paths from the master LSS.

14. Optionally, you can click the **Create path** button to create a new path. After you create the Metro Mirror relationship and the table resets, the new valid subordinates are available for selection.
15. Click **Next**. The Modify Global Mirror — Verification page is displayed.
16. In Modify Global Mirror — Verification, review the attributes and values to verify that they are correct.
17. If the attributes and values are not correct, click **Back** as appropriate to return to the page where you want to make changes and then specify the correct values. Otherwise, click **Finish**.

## Modifying the maximum coordination interval

Complete this task to modify the maximum coordination interval.

The maximum coordination interval indicates the maximum time (in milliseconds) in which the primary host I/O is paused to form a consistency group. The default value of the maximum coordination interval is 50. The maximum value is 65535 milliseconds.

**Note:** You must pause the Global Mirror session before making any modifications.

After this command processes, a confirmation message is displayed indicating that the specified Global Mirror session has resumed successfully.

Perform the following steps to modify the consistency group interval time:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Global Mirror**. A page containing a list of sessions displays. Select one or more sessions on which to perform an action.
2. On the Global Mirror — Main page, select **Modify** from the **Select Action** drop-down list. Then click **Go**. The Modify Global Mirror — Select volumes page is displayed.
3. From the Modify Global Mirror — Select volumes page, accept or modify the selected storage complex from the **Select storage complex** drop-down list.
4. Accept or modify the selected volumes from the **Select volumes** navigation. The volumes that you selected appear in the **Selected volumes** list.
  - a. Optionally, you can click the **Create FlashCopy** button to create a new FlashCopy relationship. After you create the FlashCopy relationship and the table resets, the new valid volumes are available for selection.
  - b. Optionally, you can click the **Create Metro Mirror** button to create a new Metro Mirror relationship. After you create the Metro Mirror relationship and the table resets, the new valid volumes are available for selection.
5. When you have finished selecting your volumes, click **Next**. The Modify Global Mirror — Define Global Mirror properties page is displayed.
6. Accept or modify the session number in the **Enter session number** field.
 

**Note:** The session number consists of two hexadecimal characters ranging from 01 - FF (1-255 in decimal). This number is unique across the enterprise and uniquely identifies the session.
7. Accept or modify the storage complex for the master LSS in the **Select storage complex for master LSS** field.
8. Optionally, specify the master LSS in **Select master LSS**.



**Note:** The master LSSs that are available for selection depend on what you specified for **Select storage complex for master LSS**.

9. Optionally, specify the consistency group interval time in **Consistency group interval time**. This value indicates how long (in seconds) you must wait between the formation of consistency groups. If the value is set to zero, the consistency group is formed continuously. The default value is 0. The maximum value is 65535 seconds.
10. Specify the maximum coordination interval in **Maximum coordination interval**. This value indicates the maximum time (in milliseconds) that XDC pauses the primary host I/O to form a consistency group. The default value is 50. The maximum value is 65535 milliseconds. This field is optional.
11. Optionally, specify the maximum time writes are inhibited to the remote site before stopping the current consistency group in **Maximum time writes inhibited to remote site**. This value indicates the maximum amount of time (in seconds) that writes are inhibited to the remote site before stopping the current consistency group. The default value is 30 seconds.
12. Click **Next**. The Modify Global Mirror — Select subordinates page is displayed.
13. Accept or modify the selected subordinates. The subordinates that you selected appear in the **Selected subordinates** list.

**Note:** In a single session, you can only select one subordinate per storage unit that is not the master storage unit. Subordinate storage units and LSSs are limited to those storage units that have paths from the master LSS.

14. Optionally, you can click the **Create path** button to create a new path. After you create the Metro Mirror relationship and the table resets, the new valid subordinates are available for selection.
15. Click **Next**. The Modify Global Mirror — Verification page is displayed.
16. In Modify Global Mirror — Verification, review the attributes and values to verify that they are correct.
17. If the attributes and values are not correct, click **Back** as appropriate to return to the page where you want to make changes and then specify the correct values. Otherwise, click **Finish**.

## Pausing a Global Mirror session

Complete this task to pause a Global Mirror session that is currently running.

Perform the following steps to pause a Global Mirror session:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Global Mirror**. A page containing a list of sessions displays. Select one or more sessions on which to perform an action.
2. In Global Mirror — Main Page, select **Pause** from the **Select Action** drop-down list. Then click **Go**.
3. A confirmation box is displayed. Confirm the action to pause the session.

## Removing volumes from a Global Mirror session

Complete this task to remove volumes from an existing Global Mirror session by modifying the Global Mirror session properties.

Perform the following steps to remove volumes from a Global Mirror session:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Global Mirror**. A page containing a list of volumes displays. Select one or more volumes on which to perform an action.
2. In Global Mirror — Main Page, select **Modify** from the **Select Action** drop-down list. Then click **Go**. The Modify Global Mirror — Select volumes page is displayed. The volumes that are currently part of this session are already selected.
3. From the Modify Global Mirror — Select volumes page, accept or modify the selected storage complex from the **Select storage complex** drop-down list.
4. Accept or modify the selected volumes from the **Select volumes** navigation. The volumes that you selected appear in the **Selected volumes** list.
  - a. Optionally, you can click the **Create FlashCopy** button to create a new FlashCopy relationship. After you create the FlashCopy relationship and the table resets, the new valid volumes are available for selection.
  - b. Optionally, you can click the **Create Metro Mirror** button to create a new Metro Mirror relationship. After you create the Metro Mirror relationship and the table resets, the new valid volumes are available for selection.
5. When you have finished selecting your volumes, click **Next**. The Modify Global Mirror — Define Global Mirror properties page is displayed.
6. Accept or modify the properties, and click **Next**. The Modify Global Mirror — Select subordinates page is displayed.
7. Accept or modify the selected subordinates, and click **Next**. The Modify Global Mirror — Verification page is displayed.
8. In Modify Global Mirror — Verification, review the attributes and values to verify that they are correct.
9. If the attributes and values are not correct, click **Back** as appropriate to return to the page where you want to make changes and then specify the correct values. Otherwise, click **Finish**.

## Removing your Global Mirror environment

Complete this task to remove your Global Mirror environment. It will delete all of your Global Mirror setup.

Perform the following steps to remove your Global Mirror environment entirely from your system.

1. Delete the Global Mirror session.
2. Delete the FlashCopy and Global Copy pairs.
3. Delete all the paths that you created between the Global Copy source and target volume pairs, and between the master and subordinate storage units.

## Resuming a Global Mirror session

Complete this task to resume a Global Mirror session that is currently paused. You can only resume a session that is not currently running.

Perform the following steps to resume a Global Mirror session:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Global Mirror**. A page containing a list of sessions displays. Select one or more sessions on which to perform an action.
2. In Global Mirror — Main Page, select **Resume** from the **Select Action** drop-down list. Then click **Go**.
3. A confirmation box is displayed. Confirm the action to resume the session.



## Viewing Global Mirror session properties

Complete this task to view general properties of the Global Mirror session or information about Global Mirror session failures.

Perform the following steps to view Global Mirror session properties:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Global Mirror**. A page containing a list of sessions displays. Select one or more sessions on which to perform an action.
2. In Global Mirror — Main Page, select **Properties** from the **Select Action** drop-down list. Then click **Go**.
3. The Global Mirror session properties page is displayed. On this page, you can view general properties of the Global Mirror session by selecting the **General** tab, or information about failures on the Global Mirror session by selecting the **Failures** tab. When you select the **General** tab, the following session properties display:

### Global Mirror properties

#### Session number

The session ID that you assigned, '01-FF' (1-255 decimal).

#### Master storage unit

The serial number (or nickname) of the master storage unit.

#### Master LSS

The LSS ID which consists of a *Storage Unit ID* followed by two hexadecimal characters (00 - 1F) that identify a Global Mirror master LSS ID.

#### Subordinate ID

The serial number (or nickname) and LSS of the subordinate storage unit, if applicable. If there subordinates are not available, the column will display "No subordinates."

#### Consistency Group Interval

The amount of time that Global Mirror is in Global Copy mode between the formation of each consistency group. The default is zero seconds, which means that Global Mirror will continuously form consistency groups as fast as the environment will allow.

#### Maximum Coordination Interval

The maximum time that Global Mirror will allow for the formation of the consistency group before failing this consistency group, up to 65,535 milliseconds. Having this time value set ensures that if there is an error recovery event or communications problem, applications will not experience significant impact from consistency group formation failures.

#### Time writes Inhibited at Remote Site

The maximum time that will be spent sending the current consistency group to the remote site before completion of the current consistency group fails. The default is 30 seconds.

#### Consistency Group Attempts

The number of attempts recorded since the last successful consistency group was formed in a Global Mirror session.

When you select the **Failures** tab, the following properties display:

## Select failure

### Most recent failure

Specifies that information about the most recent failure of the consistency group formation attempt is displayed.

### Previous failure

Specifies that information about the next to last failure of the consistency group formation attempt is displayed.

### First failure

Specifies that information about the first failure of the consistency group formation is displayed.

## Failure data

### Storage unit sequence number

The five-digit storage unit sequence number.

### Failing LSS

The LSS number that has caused the failure of the consistency group formation.

### Failure reason

The error reason of the failure of the consistency group formation attempt.

### Master state

The state of the master storage unit for the Global Mirror failure.

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## Metro Mirror

This topic provides information to help you get started and later manage your data using Metro Mirror functions. 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.

## Creating a Global Copy relationship

Complete this task to create a Global Copy relationship between a source volume and a target volume.

Before you begin, ensure that you have met the following conditions:

- Ensure that the Remote Mirror and Copy license key is installed and enabled to allow operations to be performed.
- Set up the paths between the source and the target LSSs for the Global Copy relationships. Paths are needed for communication between the volume pairs and to copy data from the source to the target. If paths are not established, this task fails.
- Identify the source volumes and the target volumes for the Global Copy relationships.
- Identify the LSSs that contains the desired source volumes and target volumes.

Global Copy is an asynchronous remote copy function for longer distances than is possible with Metro Mirror. With Global Copy, write operations complete on the primary storage unit before they are received by the secondary storage unit. This capability is designed to prevent the primary system's performance from being

affected by wait time from writes on the secondary system. Therefore, the source and target volumes can be separated by any distance.

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.

When Global Copy volumes are established, the status is Copy Pending. The volumes must be synchronized before the status changes to full duplex.

Perform the following steps to create a Global Copy relationship:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Metro Mirror**.
2. Select a storage complex from the **Storage complex** drop-down box.
3. Select a storage unit from the **Storage unit** drop-down box. continue to the next step.
4. Select a resource type from the **Resource type** drop-down box.
5. Select which resource to view from **Specify (LSS, Host attachment, Volume Group, Show all volumes)** .
6. Select **Create** from the **Select Action** drop-down box. Then click **Go**. The Create Metro Mirror page displays.
7. In the Volume pairing method page, you must specify one of the following methods by which to select volume pairs and then click **Next** .
  - a. If you click the **Automated volume pair assignment**, the first selected source volume is paired with the first selected target volume automatically.
  - b. If you click **Manual volume pair assignment**, you must select each specific target volume for each selected source volume.
8. In the Select source volumes page, select the volumes that you want to include for the Global Copy relationships.
  - a. Optionally, you can click the **Create paths** button to create a new paths. If you select this button, the **Create paths** page displays where you can create a new path.
9. In the Select target volumes page, select target volumes. Click the storage complex drop down box to change where target volumes are selected and then click **Next**. Consider the following guidelines:
  - a. If you selected the automated pairing method, each source volume that you selected is paired with a target volume.
  - b. If you selected the manual pairing method, you can select target volumes from different LSSs on the target storage unit. This page repeats for each of the source volumes that you selected.
10. In the Select copy options page, select the radio button for Global Copy. Keep the following options in mind when selecting those to apply to the volume pairs and click **Next**.
  - a. Select the **Perform initial copy** option the first time a relationship is created as it is needed to ensure that the entire source volume is copied to the target volume to guarantee that the source and target volumes contain the same data.
  - b. Select the **Permit read access from target** option to allow host servers to read from the Global Copy target volume. Unlike a Metro Mirror pair, the pair is not required to be in a duplex state for the host server to read the target volume.

11. In the Verification page, review the attributes and values to verify that they are correct.
12. If the attributes and values are not correct, click **Back** as appropriate to return and then specify the correct values. Otherwise, click **Finish** to complete the Metro Mirror creation process.

## 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:

- Ensure that the Remote Mirror and Copy license key is installed and enabled to allow operations to be performed.
- Set up the paths between the source and the target LSSs for the Metro Mirror relationships.
- Identify the source volumes and the target volumes for the Metro Mirror relationships.
- Identify the LSSs that contains the desired source volumes and target volumes.

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 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 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 a Metro Mirror relationship between a source volume and target volume:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Metro Mirror**.
2. Select a storage complex from the **Storage complex** drop-down box.
3. Select a storage unit from the **Storage unit** drop-down box. continue to the next step.
4. Select a resource type from the **Resource type** drop-down box.
5. Select the resource **Specify (LSS, Host attachment, Volume Group, Show all volumes)** from which to access volumes.
6. Select **Create** from the **Select Action** drop-down box. Then click **Go**. The Create Metro Mirror page displays.
7. In the Volume pairing method page, you must specify one of the following methods by which to select volume pairs and then click **Next** .
  - a. If you click the **Automated volume pair assignment**, the first selected source volume is paired with the first selected target volume automatically.
  - b. If you click **Manual volume pair assignment**, you must select each specific target volume for each selected source volume.
8. In the Select source volumes page, select the volumes that you want to include for the Metro Mirror relationships.
  - a. Optionally, you can click the **Create paths** button to create a new paths. If you select this button, the **Create paths** page displays where you can create a new path.

9. In the Select target volumes page, select target volumes. Click the storage complex drop down box to change where target volumes are selected and then click **Next**. Consider the following guidelines:
  - a. If you selected the automated pairing method, each source volume that you selected is paired with a target volume.
  - b. If you selected the manual pairing method, you can select target volumes from different LSSs on the target storage unit. This page repeats for each of the source volumes that you selected.
10. In the Select copy options page, select the options you want to apply to the volume pairs and click **Next**. Consider the following options:
  - a. Select the **Perform initial copy** option the first time a relationship is created as it is needed to ensure that the entire source volume is copied to the target volume to guarantee that the source and target volumes contain the same data.
  - b. The **Enable critical volume mode** option is supported for count-key-data volumes only. The **Create relationship, even if target is online to host** option, is available for count-key-data volumes only.
  - c. The **Suspend Metro Mirror relationship after initial copy** option applies only to Metro Mirror relationships. This means that after data is completely copied to the target volume of that volume pair, the target volume goes into a suspended state.
11. In the Verification page, review the attributes and values to verify that they are correct.
12. If the attributes and values are not correct, click **Back** as appropriate to return and then specify the correct values. Otherwise, click **Finish** to complete the Metro Mirror creation process.

## 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 machine types 1750 and a 2105, you must have added the **Add 2105 Copy Services Domain** option from the Select Action drop-down list when you configured 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.

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

**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 .

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Metro Mirror**.
2. Select the **2105 Copy Services domain** from the list of storage complexes. This option is enabled if you included a Copy Services domain for the 2105 when you selected Storage Complex from the Select Action drop-down list under **Manage Hardware**. All storage complexes that you added when you configured your environment are included in the drop-down list.
3. Select a storage unit that you will be working with from the **Storage unit** drop-down menu.
4. Select a resource type from the **Resource type** drop-down menu.
5. Select which resource to view from the **Specify (LSS, Volume Group, Host attachment, Storage type)** drop-down menu.
6. Click on **Select Action** drop-down menu and select **Create...** and click **Go**.
7. On the Volume pairing method page, specify one of the following methods by which to select volume pairs and then click **Next**.
  - a. If you click the **Automated volume pair assignment**, the first selected source volume is paired automatically with the first selected target volume.
  - b. If you click **Manual volume pair assignment**, you must select each specific target volume for each selected source volume.
8. On the Select source volumes page, select the volumes that you want to include for the Metro Mirror relationships and click **Next**. If the resource type is an LSS, specify which from LSS to select source volumes. Optionally, you can click the **Create paths** button to create a new path. You are linked to the page where you can create a path.
9. On the Select target volumes page, select target volumes by changing the storage complex to the name that is associated with the 1750 domain, and click **Next**. Consider the following guidelines:
  - a. If you selected the automated pairing method, each source volume that you selected is paired with a target volume.
  - b. If you selected the manual pairing method, you can select target volumes from different LSSs on the target storage unit. This page repeats for each of the source volumes that you selected.
10. On the Select copy options page, select the type of relationship and the copy options for the relationship and click **Next**. The **Enable critical volume mode** and **Create relationship even if target is online to host** options are available for count-key-data volumes only.
  - a. Select the **Perform initial copy** option the first time a that volume pair is created because it is needed to ensure that the entire source volume is copied to the target volume to guarantee that the source and target volumes contain the same data.

- b. Optionally, you can select the **Suspend Metro Mirror relationship after initial copy** option because it only applies to Metro Mirror volume pairs. This means that after data is completely copied to the target volume of the volume pair, the target volume goes into the suspended state.
11. On the Verification page, review the attributes and values to verify that they are correct.
12. If the attributes and values are not correct, click **Back** to return and specify the correct values. Otherwise, click **Finish** to complete the process.

## 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 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 when you would convert a Global Copy volume pair to a Metro Mirror volume pair:

- 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.
- You have Global Copy 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.

If you created a Global Copy volume pair where the source volume was associated with a 1750 storage unit and the target volume was from ESS 2105 Model 800 or 750, you can convert that volume pair to synchronous. All domains that you added when you configured your environment are included in the Storage Complex drop-down list. The volumes involved in relationships can be source or target volumes.

Perform the following steps to convert a Global Copy relationship to a Metro Mirror synchronous relationship:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Metro Mirror**. A page containing volume pairs displays from which you can select.
2. Select one or more volume pairs and select **Convert to synchronous** from the **Select Action** drop-down box. Then, click **Go**.
3. On the table that displays, confirm which selected relationships the volume tracks will be converted to synchronous. Then, click **OK**.

## Deleting a Metro Mirror relationship

Complete this task to delete a Metro Mirror relationship between the a source and target volume.

You can use this function to delete a Metro Mirror pair. The source and target volumes are removed from the configuration when this process runs.

Perform the following steps to delete a Metro Mirror relationship between the a source and target volume:



1. In the navigation, select **Real-time Manager** → **Copy Services** → **Metro Mirror**. A page containing a list of Metro Mirror volumes displays. Select one or more volumes on which to perform an action.
2. In the Metro Mirror — Main Page, select **Delete** from the **Select Action** drop-down box. Then, click **Go**.
  - 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 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 suspended state, and the target volume is in simplex state. This option is useful in a disaster situation when the source (local) site has gone down.
3. A confirmation box is displayed. Confirm the action to delete the volume pair.

## Performing a failback recovery operation

Complete this task to confirm the volume pairs on which the disaster recovery failback operation will be run. The failback operation copies all modified tracks from a target volume to a source volume.

You must first create a remote mirror and copy volume pair. Before you run the failback operation, the volumes must be full duplex. You must create a path between the LSSs from the target site to the source site and from the source to the target site.

When you are ready to return to Site A (your production site), use the failback operation (on the Volume A-Volume B pair) from Site B (your recovery site). This process makes the target volume (Volume B) transition to a source and the original source volume (Volume A) transition to a new target volume. The process will resynchronize the volumes with those at Site A. At Site B, ensure failback process is complete and that the volume pair is duplex.

Perform the following steps to confirm which volume pairs a failback operation is run against.

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Metro Mirror**. Select the volume pair that the failover operation was performed against. The status of the volume pair should display as Suspended.
2. Select Recovery Failback from the Select Action drop-down menu and then click **OK**.
3. A table displays showing the volume pairs in which the failback process will occur. The status of the volume pairs should display as Suspended.
4. Click **OK** to complete the process. Otherwise, click **Cancel** and your selection is canceled and the page closes.

## Performing a failover recovery operation

Complete this task to confirm the volume pairs on which the disaster recovery failover operation will be run. 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.



When you are ready to return to Site A (your production site), issue the failback operation (on the Volume A-Volume B pair) from Site B (your recovery site). This process makes the target volume (Volume B) transition to a source and the original source volume (Volume A) transition to a new target volume. The process will re-synchronize the volumes with those at Site A. At Site A, ensure failback process is complete and that the volume pair is duplex.

Perform the following steps to confirm the volume pairs on which the disaster recovery failover operation will be run:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Metro Mirror**. A page containing a list of Metro Mirror volumes displays. Select one or more volumes on which to perform an action.
2. Select Recovery Failover from the Select Action drop-down box and click **OK**.
3. A table displays showing the volume pairs in which the failover process will occur. Volume nicknames are not displayed if the volumes are associated with a 2105.
4. If you want to cancel the options, click **Cancel** and the page closes.

## Resuming a Metro Mirror relationship

Complete this task to resume a Metro Mirror relationship between a volume pair that has been suspended (or 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 PPRC Version 2 license enabled.
- 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. For task information, see “Creating Remote Mirror and Copy paths” on page 48.

Perform the following steps to resume a Metro Mirror volume pair:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Metro Mirror**. A page containing a list of Metro Mirror volumes displays. Select one or more volumes on which to perform an action.
2. In the Metro Mirror — Main Page, select **Resume** from the **Select Action** drop-down box. Then, click **Go**.
3. A confirmation box is displayed. Confirm the action to copy the out-of-sync tracks on the volume pair and allow the volume pair to be synchronized.

## Resynchronizing a Metro Mirror volume pair

Use this process to resynchronize a volume pair in suspended mode.

When you resynchronize a Metro Mirror copy pair, all out-of-sync tracks on the source volume will be copied to the target volume.

1. In the navigation, under Copy Services, select Metro Mirror. A page containing a list of Metro Mirror volumes displays. Select one or more volumes on which to perform an action.
2. In the Metro Mirror — Main Page, select **Resume** from the **Select Action** drop-down box. Then, click **Go**.

3. A confirmation box is displayed. Confirm the action to resynchronize the volume pair and allow operations to continue for the volume pairs.

## Suspending a Metro Mirror relationship

Complete this task to suspend a Metro Mirror relationship.

You must resynchronize a volume pair after suspending it to allow operations to continue.

To get access to the target volumes or for maintenance of the remote storage unit, you can suspend (pause) the Metro Mirror volume pair. Metro Mirror stops transferring data 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 the changes to the source volume are copied to the target volume.

Perform the following steps to suspend a Metro Mirror relationship:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Metro Mirror**. A page containing a list of Metro Mirror volumes displays. Select one or more volumes on which to perform an action.
2. In Metro Mirror — Main Page, select **Suspend** from the **Select Action** drop-down box. Then click **Go**. The Suspend Metro Mirror — Select volumes page is displayed.
3. The source or target volumes that are eligible for suspension are already selected. Accept or modify the selected volumes, and then click **OK** to confirm your selection.

## Viewing information about Metro Mirror relationships

Complete this task to view information about volume pairs in Metro Mirror relationships.

Perform the following steps to view information about volume pairs in Metro Mirror relationships:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Metro Mirror**. A page containing a list of Metro Mirror volumes displays. Select one or more volumes on which to perform an action.
2. In the Metro Mirror — Main Page, select **Properties** from the **Select Action** drop-down box. Then click **Go**. The Metro Mirror Properties page is displayed where you can view information about volume pairs that are participating in Metro Mirror relationships.

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## Paths

Before you can create Metro Mirror and Global Mirror volume paths, you must create paths. Paths are needed to communicate between the volume pairs and to copy data from the source volume to target volume.

## Creating a Global Copy volume pair

Use this process to create a Global Copy volume pair.

Before you begin with this task, follow these guidelines:

1. Ensure that the Remote Mirror and Copy license key is installed and enabled to allow operations to be performed.

2. Set up the paths between the source and the target LSSs for the Global Copy relationships.
3. Identify the source volumes and the target volumes for the Global Copy relationships.
4. Identify the LSSs that contains the desired source volumes and target volumes.

If your environment has bandwidth restrictions or has extended distance requirements, Global Copy is an excellent solution for your disaster recovery solutions and data copying requirements. The source volume sends a periodic, incremental copy of updated tracks to the target volume instead of a constant stream of updates. This causes less impact to application writes for source volumes and less demand for bandwidth resources, while allowing a more flexible use of the available bandwidth.

Global Copy can operate at very long distances (continental), well beyond the distance supported for Metro Mirror transmissions. The distance is limited only by the network and channel extender technology.

1. In the navigation, under Manage Copy Services, select Metro Mirror. A page containing a list of Metro Mirror volumes displays. Select one or more volumes on which to perform an action.
2. In Metro Mirror — Main Page, select **Create** from the **Select Action** drop-down box. Then click **Go**. The Create Metro Mirror page displays.
3. Select a storage complex from the **Select storage complex** drop-down box.
4. Select a storage unit from the **Storage unit** drop-down box. continue to the next step.
5. Select a resource type from the **Resource type** drop-down box.
6. Select which resource to view from the **Specify (LSS, volume group, storage type)** drop-down box.
7. In Create — Volume pairing method page, you must specify one of the following methods by which to select volume pairs.
  - a. If you click **Automated volume pair assignment** method, source volumes are paired with target volumes automatically. If you select this method, target volumes are selected automatically.
  - b. If you click **Manual volume pair assignment**, you must select each specific target volume for each selected source volume.
8. Click **Next**.
9. In the Create Metro Mirror — Select source volumes page, select the volumes that you want to include for the Metro Mirror relationships.
  - a. Optionally, you can click the **Create paths** button to create a new paths. If you select this button, the **Create paths** page displays to allow you select the new paths.
10. Click **Next**.
11. In Select target volumes (auto pairing) page, select the target volumes. This page displays if you selected the auto pairing method; only valid, eligible target volumes are displayed.
12. In Select target volumes (manual pairing) page, select the target volumes. This page displays if you selected the manual pairing method. Select the same number of target volumes as you selected for source volumes. This page repeats for each of the source volumes that you selected.
13. Click **Next**.

14. In Create Metro Mirror — Select copy options page, select the options you want to apply to the volume pairs. The **Enable critical volume mode** option is supported for count-key-data volumes only. The **Create relationship even if target is online to host** option is available for zSeries volumes only.
15. Click **Next**.
16. In Create Metro Mirror — Verification, review the attributes and values to verify that they are correct.
17. If the attributes and values are not correct, click **Back** as appropriate to return and then specify the correct values. Otherwise, click **Finish** to complete the Metro Mirror creation process.

## Creating Remote Mirror and Copy paths

Complete this task to create paths as they are required before you can create source and target remote mirror and copy volume pair relationships.

You must create logical paths between logical subsystems (LSSs) in a source storage unit and LSSs in a target storage unit. These are the paths through which data will be transferred so it is 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:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Paths**.
2. Select **Create** from the **Select Action** drop-down box. Then, click **Go**.
3. Select the source LSS and click **Next**.
4. In the Select target LSS page, select the target LSS and click **Next**.
5. In the Select source I/O ports page, select the source I/O ports for the selected storage unit and click **Next**.

**Note:** You can configure I/O port properties on the Storage Units page only.

6. In the Select target I/O ports page, select the target I/O ports for each source port and click **Next**.
7. Optionally, in the Select path option page, select the consistency path option and click **Next**.
  - a. If you do not select the consistency group option, the storage unit causes the volume where the error is detected to enter a suspended state, but updates to that volume are still allowed.
  - b. If you select the consistency group option, if a total link failure is detected between the source and target LSS pair or if the volume (where the error is detected) becomes suspended and enters a long busy state, the primary host temporarily queues all the updates to the source volumes.
8. In Create Paths — Verification, review the attributes and values that you selected to verify that they are correct.
9. If the attributes and values are not correct, click **Back** as appropriate to return and then specify the correct values. Otherwise, click **Finish** to complete the consistency group process.

## Defining a path that has the consistency option enabled

Complete this task to define a path that has the consistency group option enabled 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.

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 the consistency group option enabled. 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 created operation is run or the consistency group timeout time expires, allowing 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 steps to defining a path that has the consistency option enabled:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Paths**.
2. In the Paths — Main Page, select **Create** from the **Select Action** drop-down box. Then, click **Go**. The Create Path — Create source LSS page displays.
3. Select the source LSS. To remove any existing paths from this source LSS, use the Delete page.
4. Click **Next**.
5. In the Create Paths — Select target LSS page, select the target LSS. Click **Next**.
6. In the Create Paths — Select source I/O ports page, select the source I/O ports for the storage unit. Click **Next**.
7. In the Create Paths — Select target I/O ports page, select the target I/O ports for each source port. Click **Next**.
8. In the Create Paths — Select path options, select the **Define as a consistency group option**. Click **Next**.
9. In Create Paths — Verification, review the attributes and values that you selected to verify that they are correct.
10. If the attributes and values are not correct, click **Back** as appropriate to return and then specify the correct values. Otherwise, click **Finish** to complete the consistency group process.

## Deleting paths

Complete this task to remove paths between the source LSS and target LSS.

If you delete all paths, you lose the communication between your remote mirror and copy volume pairs. All paths are deleted between the source and target LSSs.

Perform the following steps to delete paths:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Paths**.
2. In the Paths — Main Page, select the paths in the table that you want to delete and select **Delete** from the **Select Action** drop-down box. Then, click **Go**.

**Note:** When you delete paths from the source LSS, a message is generated stating that removing all paths causes volume pairs in Metro Mirror relationships that are using those paths to suspend. Paths that are not selected are not deleted.

3. A confirmation box is displayed. Confirm the action to delete the paths.

## Modifying logical subsystem timeout values

This section describes the list of logical subsystem (LSS) timeout values that you can modify.

The following lists contains the LSS timeout values that you can modify:

- Concurrent copy timeout
- Consistency group timeout
- Critical mode enable

### 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.

Concurrent Copy provides another method for creating a point-in-time copy in a zSeries environment, with the source data available for access and update after the copy operation has been initiated. This option is supported in zSeries environments only.

Perform the following steps to modify the default value (300 seconds) that 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:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Paths**.
2. On the Paths — Main page, select **LSS copy options** from the **Select Action** drop-down list. Then click **Go**. The LSS copy options page is displayed.
3. From the LSS copy options page, accept or modify the storage complex from the **Storage complex** drop-down list.
4. Accept or modify the storage unit from the **Storage unit** drop-down list.
5. Accept or modify the selected LSSs from the **Select LSS** drop-down list. The LSSs that you selected appear in the table. If you select All LSSs, the timeout value applies to all LSSs in the storage unit that you selected on this page.
6. Accept or modify the Concurrent Copy timeout value by highlighting and typing over the default value (300 seconds).
7. Click **OK**.
8. If the attributes and values are not correct, click **Cancel** as appropriate to return to the page where you want to make changes and then specify the correct values. Otherwise, click **OK**.

### 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 an error occurs.

The consistency group timeout value 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 steps to modify the consistency group timeout value:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Paths**.
2. On the Paths — Main page, select **LSS copy options** from the **Select Action** drop-down list. Then click **Go**. The LSS copy options page is displayed.
3. From the LSS copy options page, accept or modify the storage complex from the **Storage complex** drop-down list.
4. Accept or modify the storage unit from the **Storage unit** drop-down list.
5. Accept or modify the selected LSSs from the **Select LSS** drop-down list. The LSSs that you selected appear in the table. If you select All LSSs, the timeout value applies to all LSSs in the storage unit that you selected on this page.
6. Accept or modify the consistency group timeout value (two minutes) by highlight the value and typing over the default.
7. Click **Next**.
8. If the attributes and values are not correct, click **Cancel** as appropriate to return to the page where you want to make changes and then specify the correct values. Otherwise, click **OK** to complete the volume group creation process.

## Modifying the critical mode setting

Complete this task to enable the critical mode setting to prevent writes to source volumes if data cannot be copied to the target volume of the volume pair because of a permanent error.

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 writes 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 target volume, the remote mirror and copy feature, suspends the copy pair, allowing 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 steps to modify the critical mode setting:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Paths**.
2. On the Paths — Main page, select **LSS copy options** from the **Select Action** drop-down list. Then click **Go**. The LSS copy options page is displayed.
3. From the LSS copy options page, accept or modify the storage complex from the **Storage complex** drop-down list.
4. Accept or modify the storage unit from the **Storage unit** drop-down list.
5. Accept or modify the selected LSSs from the **Select LSS** drop-down list. The LSSs that you selected appear in the table. If you select All LSSs, the timeout value applies to all LSSs in the storage unit that you selected on this page.

6. Select the **Critical Mode** option to enable the setting.
7. Click **OK**.
8. If the attributes and values are not correct, click **Cancel** as appropriate to return to the page where you want to make changes and then specify the correct values. Otherwise, click **OK**.

## Monitoring Remote Mirror and Copy paths

Complete this task to display a list of existing remote mirror and copy path definitions.

Perform the following steps to monitor remote mirror and copy paths:

1. In the navigation, select **Real-time Manager** → **Copy Services** → **Paths**.
2. To display established paths, select in the Paths page the storage unit and the LSS for which you want to display the paths. When you have selected one or more paths, the pull-down menu gives you the following additional actions:
  - From the Select Actions pull-down menu, you can choose **Delete** to delete the paths you have selected before.
  - From the Select Actions pull-down menu, you can choose **LSS copy options** to modify the copy options for an LSS.



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## Chapter 6. Host systems

The topics in this category cover information related to working with host systems. Information on the host systems pages can be found in the Reference section.

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### Creating host systems

Complete this task to create host systems and define their parameters.

1. In the navigation, select **Real-time manager or Simulated manager** → **Manage hardware** → **Host systems**. In Host Systems — Main Page, select a storage complex (and possibly a storage unit). From the **Select Action** menu, select **Create....** Then click **Go**. The Create Host System — General host information page is displayed.
2. In the General host information page, specify the host type and nickname and optionally provide a description. Then click **Next**. If you specified an open systems host, the Create Host System — Define host ports page is displayed; go to the next step.
3. In the Define host ports page, you must specify the quantity and attachment port type and you must click **Add** to add at least one host port definition to the Defined host ports table. You can optionally check the **Group ports to share a common set of volumes** box, so the quantity of ports identified in the Quantity field becomes grouped together and treated as a single host attachment.
4. Select at least one host port from the Define host ports table, and then click **Next**. The Create Host System — Define Host WWPN page is displayed.
5. In the Define Host WWPN page, specify the host port WWPNs for open systems hosts. Then click **Next**. The Create Host Systems — Specify storage units page is displayed.
6. In the Select storage units page, select each storage unit you want to access from the server by selecting a it from the Available storage units list and clicking **Add**. Then click **Next**. If you select the **Create a Storage Unit** button (Simulated only), follow the process for creating the new storage unit. Once you have completed that process by clicking on the **Finish** button, the new storage unit is available for selection.
7. In the Create Host Systems — Specify storage unit parameters page, specify the parameter values. Select a host attachment ID. Select a volume group to which the host attachment needs access. (You can optionally choose **Select volume group later** if you do not want to select the volume group now.) Choose a login option to determine the FC adapter ports that the host can access. You can loop through this page for each host attachment identifier by selecting the **Apply assignment** button to commit the current transaction. You can start from the top to select another identifier. If you select an existing host attachment identifier from the table, you can click the **Create a new group** button to create a new volume group for selection. If you decide that this host attachment can log in to **the following specific storage unit I/O ports**, you must specify the specific ports in the available storage unit I/O ports table. When you are finished in the Specify storage unit parameters page, click **Apply assignment**, then click **OK**. The Create Host Systems — Verification page is displayed.

**Note:** You must click **Apply assignment** with at least one host attachment to the storage image before you can proceed to the Create Host Systems — Verification page.

8. In the Verification page, review the attributes and values to verify that they are correct.
9. If the attributes and values are not correct, click **Back** as appropriate to return and to specify the correct values. Otherwise, click **Finish** to complete the host system creation process.

If you are setting up the DS Storage Manager, return to Setting up the DS Storage Manager and complete the rest of the steps.

---

## Modifying host systems

Complete this task to modify the parameters, such as the nickname or WWPN, that were specified for established host systems.

Modifying host information 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 modify host information.

1. In the navigation, select **Real-time manager or Simulated manager** → **Manage hardware** → **Host systems**. In Host Systems — Main Page, select a host from the table.
2. Select **Modify...** from the **Select Action** drop-down list. Then click **Go**. The Modify Host System — General host information page is displayed.
3. In the General host information page, you can modify the nickname and optionally provide a description. Then click **Next**.
4. In the Define host ports page, you can specify the quantity and type. You must select a host port in the Defined host ports table before moving to the next step. The following list presents potential modifications and the resulting actions:
  - You can add another host attachment by specifying the **Quantity** and **Type**. Optionally, you can select **Group ports to share a common set of volumes** to share a common set of volumes. If this box is checked by the user, the quantity of ports identified in the Quantity field above becomes grouped together and treated as a single host attachment.
  - You can select an existing host port from the **Defined host ports** table and then select the **Remove** button. The related fields on the left side of the page populate with the information that was just removed. If you want to modify any of those fields, then select the **Add** button; the new host attachment is added to the **Defined host ports** table. If you want to remove it all together, just proceed through the wizard.

**Note:** If you remove a host attachment, the volume group assigned to the attachment is no longer accessed by the host attachment. In other words, all previously defined storage unit association (storage unit ports and volume group) with this host attachment is lost.

5. When you are finished in the Define host ports page, click **OK**. The Modify Host System — Define host WWPN page is displayed.
6. In the Define host WWPN page, you can modify the host port WWPN for open systems hosts. Then click **OK**. The Modify Host Systems — Specify storage units page is displayed.

**Note:** To add a host, select **Add entry form** from the drop down list, enter a 16-digit WWPN and then click the **Add** button. You can add or modify the WWPN for each included host port.

7. In the Specify storage units page, you can add or remove any of the storage units in the **Available storage units** or the **Selected storage units** boxes.
  - If you add storage units, you must complete the Specify storage unit parameters page for each newly added storage unit.
  - If you remove storage units, all of the associations between the host attachment and the storage unit (storage unit ports and volume group) are lost.
8. When you are finished in the Specify storage units page, click **Next**. The Modify Host Systems — Specify storage unit parameters page is displayed.
9. In the Specify storage unit parameters page, you can modify parameter values. The **Apply assignment** button commits the current transaction. If you select an existing host attachment from the **Select host attachment identifiers** table, you can:
  - Select another volume group for the host attachment by choosing from the **Select volume group for host attachment** drop-down box.
  - Specify what the host attachment can login to. The **Any valid storage unit I/O port** selection enables this host attachment to login to any of the available storage unit ports. If you select **The following specific storage unit I/O ports**, then you must specify the storage unit I/O ports from the **Available storage unit I/O ports** table. You can optionally check the **View recommended** box to see the recommended storage unit port assignments displayed in the table. You can also optionally select the **Configure I/O Ports..** button and follow the process for configuring an existing I/O port. Once you have completed that process by clicking on the **Finish** button, the changed I/O port is available for selection in the Select column.
  - Select the **Create new group** button to create a new group for selection.

**Note:** If you select a new host attachment that was added in the Modify Host Systems — Define host ports page, you must proceed as you would in the create wizard mode.
10. When you are finished in the Specify storage unit parameters page, click **Apply assignment**, then **OK**. The Modify Host Systems — Verification page is displayed.
11. In the Verification page, review the modified attributes and values to verify that they are correct.
12. If the attributes and values are not correct, click **Back** as appropriate to return and then specify the correct values. Otherwise, click **Finish** to complete the host system modification process.

---

## Deleting host systems

Complete this task to remove host systems from the configuration.

1. In the navigation, select **Real-time manager or Simulated manager** → **Manage hardware** → **Host systems**.
2. Select the storage complex from the drop-down list.
3. In the table on the Host systems - Main page, select the host system that you want to delete.
4. In the **Select Action** drop-down list, select **Delete** and then **Go**. A confirmation dialog box is displayed.
5. Confirm the action to complete the deletion of the selected host systems by clicking **Continue**.

---

## Viewing and modifying properties

Complete this task to access properties pages so that you can review or modify the properties.

1. In the main page of the target subject area (for example, Host Systems), select an item in the table.
2. In the **Select Action** drop-down list, select **Properties** and then **Go**. The properties page for the selected item is displayed.
3. If the properties page is solely informational, the only button option is **OK**. Click it to close the page. If the properties page has attributes that you can modify, the button options are **OK** or **Apply**. Click **OK** to apply the changes and close the page. Click **Apply** to apply the changes and leave the page open.

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## Chapter 7. Parallel access volumes

Managing parallel access volumes when adding or reconfiguring 3390 volumes.

You must unbind and then reassociate parallel access volumes when you increase the capacity or number of 3390 volumes within a logical control unit.

---

### Reconfiguring an LCU with larger capacity 3390 volumes

Complete this task to reconfigure an LCU with larger capacity 3390 volumes.

To retain your data, you must offload the data from the address range of the ranks to be reformatted by performing the following steps:

1. Confirm the raid ranks that are associated with the address range that is being modified.
2. Vary the address range offline. This causes any associated parallel access volumes (PAVs) to become unbound.
3. Issue Devserv (DS QP,xxx,nnn) using the alias addresses to confirm aliases are unbound.
4. Undefine the raid rank to allow the configuration of larger capacity volumes.
5. Reassociate the PAVs.
6. Vary the base address range online.
7. Issue Devserv (DS QP,xxx,nnn) using the base addresses to confirm that the aliases are bound.
8. Restore the data that you offloaded.

---

### Increasing the number of 3390s formatted within an LCU

Complete this task to increase the number of 3390s that are formatted within an LCU.

To increase the number of 3390s that are formatted within an LCU, perform the following:

1. Define an input/output definition file (IODF) using HCD with the desired device addresses.
2. Remove the parallel access volumes (PAVs) using the DS6000 CLI.
3. Issue Devserv (DS QP,xxx,nnn) to the alias addresses to initiate an I/O operation.

**Note:** Messages "IOS017I ALIAS DEVICE adev IS UNBOUND" and "IOS001E xxx, INOPERATIVE PATH" are issued from all the alias addresses. These messages are normal and are not cause for concern.

4. Activate a new IODF by either performing an IPL or by dynamically activating the new IODF.

**Attention:** Ensure that there is sufficient memory in the hardware storage area to store the new configuration.

5. Add new 3390 volumes to the LCU.
6. Assign new PAVs.



---

## Chapter 8. Storage complexes

The topics in this category present information that is related to working with both real-time and simulated storage complexes. Information on the storage complex pages is in the Reference section.

---

### Creating a storage complex (simulated only)

Complete this task to create a simulated storage complex and to specify its nickname and storage unit assignments.

1. In the navigation, select **Simulated manager** → **Manage hardware** → **Storage complexes**.
2. From the **Select Action** menu, select **Create...**, and then click **Go**. The Create Storage Complex — Define properties page is displayed.
3. If a storage unit is not already defined, you must specify a nickname, which is limited to 16 characters. The other fields are optional.
  - a. The **Available and Selected Storage units** fields are not required when you create the storage complex. You can enter this value now or modify the storage complex properties later. Additionally, you can select this storage complex when you create a storage unit. You must, however, create an association between a storage complex and a storage unit at some point before you download or upload configurations to or from the storage unit.
  - b. If you select the **Create new storage unit** button, the new storage unit is available for selection after you complete the create storage unit process.
4. After you have defined the properties, click **Next** to continue. The Verification page is displayed.
5. Use the Verification page to review the established attributes and verify that they are correct. If the attributes and values are not correct, click **Back** to return and specify the correct values. Otherwise, click **Finish** to complete the storage complex creation process.

If you are setting up the DS Storage Manager, return to Setting up the DS Storage Manager and complete the rest of the steps.

---

### Modifying a storage complex (simulated only)

Complete this task to modify the nickname and storage unit assignments on an established storage complex.

1. In the navigation, select **Simulated manager** → **Manage hardware** → **Storage complexes**.
2. In the **Select Action** drop-down list, select **Modify**, and then click **Go**. The Modify Storage Complex — Define properties page is displayed.
3. In the Define properties page, established values are displayed in the fields. You can view, but not modify, these values.
  - a. The **Available and Selected Storage units** fields were not required when the storage complex was created. You can enter this value now. You must create an association between a storage complex and a storage unit at some point before downloading or uploading configurations to or from the storage unit.

- b. If you select the **Create new storage unit button**, the new storage unit is available for selection after you complete the create storage unit process.
4. After you have defined the properties, click **Next** to continue. The Verification page is displayed.
5. Use the Verification page to review the modified attributes and verify that they are correct.
6. If the attributes and values are not correct, click **Back** to return and specify the correct values. Otherwise, click **Finish** to complete the storage complex modification process.

---

## Importing a storage complex (simulated only)

Complete this task to import and define a simulated configuration of physical and logical characteristics in a storage complex by connecting to a storage complex on the management console.

1. In the navigation, select **Simulated manager** → **Manage hardware** → **Storage complexes**.
2. In the **Select Action** drop-down list, select **Import...**, and then click **Go**. The Import Storage Complex — Define management consoles page is displayed.
3. In the Define management consoles page, establish the Management console IP addresses that are required to make a direct connection to a storage complex. If you check the box for **Define a second Management console**, you must enter an IP address in the **Management console 2 IP address** field.
4. Click **Next** to continue. The Import data page is displayed.
5. In the Import data page, you must select at least one of the four options.
  - a. If you select the **General storage complex settings** box, only the general settings for the storage complex are imported.
  - b. If you select the **All storage unit physical configurations** box, only the physical characteristics of each storage unit are imported.
  - c. If you select the **All storage unit logical configurations** box, the physical and logical configuration characteristics of each storage unit are imported. If you had not previously selected the **All storage unit physical configurations** box, it becomes checked.
  - d. If you select the **All host attachments for Storage Units** box, , the physical and logical configuration characteristics of the storage unit plus all of the host attachment characteristics are imported to the application. If you had not checked the previous two boxes, they become checked.
6. Click **Next** to continue. The General page is displayed.
7. In the General page, you must specify a nickname. Specifying a description is optional.
8. Click **Next** to continue. The Verification page is displayed.
9. Use the Verification page to review the established attributes and verify that they are correct.
10. If the attributes and values are not correct, click **Back** as appropriate to return and specify the correct values. Otherwise, click **Finish** to complete the import storage complex process.

---

## Defining multiple management consoles (real-time only)

Complete this task to create a storage complex domain by establishing a connection with a secondary management console (peer) for redundancy.



You can install a secondary management console (MC) for backup purposes. It is especially important if you use DS Copy Services. You install the secondary MC the same way that you installed the primary MC.

After the primary and secondary MCs are installed, perform this process from the primary MC. You must have the MC IP address and the appropriate user ID and password. To establish a peer-to-peer relationship, both user IDs and passwords must be the same for the primary and secondary MCs.

When you add a secondary MC, the secondary MC cannot have storage units that are associated with it. If you have two MCs that each have storage units that are associated with them, you must remove the storage units from the secondary MC that you want to use as the peer of the primary MC. After you remove the storage units, add the secondary MC to the primary MC. You can then add the previously removed storage units using either the primary or the secondary MC.

You must have the same administrator password set for both MCs before you can define multiple management consoles.

Perform the following steps to establish a connection with a secondary MC for the storage complex that is associated with the primary MC.

**Note:** When you use peer MCs, if one of the consoles fails, you cannot make changes to any user accounts. If the peer-to-peer relationship cannot be restored, you must remove the secondary MC using the Removing Peer Management Consoles function, using the primary MC.

1. In the navigation, select **Real-time manager** → **Manage hardware** → **Storage complexes**. On the Storage complexes – Main page, select a storage complex.
2. From the **Select Action** menu, select **Define peer**, and then click **Go**. The Define peer management console page is displayed.
3. Perform one of the following steps, but not both:
  - Specify the server host name for the secondary MC.
  - Specify the server IP address for the secondary MC.
4. Click **OK**. The storage complex domain is established.
5. Open a command prompt and navigate to the C:\Program Files\IBM\dsniserver\bin\ directory where the recovery tool (script) has been installed.
6. Type the script name, `securityRecoveryUtility.bat -s`

**Note:** This utility synchronizes all of the user account information between the primary and secondary MCs. After the user accounts have been synchronized, all changes to user accounts are automatically reflected on both peer MCs unless the peer-to-peer relationship is broken. If you remove a peer, and define a new peer, you must run the recovery tool script again after you determine the new peer.

Click on the **Storage Complexes** main page and you should see a second MC nickname that is defined with status on the right-most column.

If you are setting up the DS Storage Manager, return to Setting up the DS Storage Manager and complete the rest of the steps.

---

## Removing peer management consoles (real-time only)

Complete this task to remove a peer management console from the selected storage complex.

This process must be done from the primary Management Console. You must have the Management Console IP address and the appropriate user ID and password.

1. In the navigation, select **Real-time Manager, Manage hardware, Storage complexes**. In Storage Complexes — Main Page, select **Remove peer** in the **Select Action** drop-down box. Then click **Go**. The Remove peer management console page is displayed.
2. Specify the server host name for the peer management console.
3. Specify the server IP address, of the peer management console of the selected storage complex.
4. Click **Ok**. All operations in progress between the peer management console and the selected storage complex will cease, and the peer management console will be removed.

---

## Adding a storage complex (real-time only)

Complete this task to add a storage complex.

You must have the storage complex IP address of the storage complex that you want to add.

1. In the navigation, select **Real-time manager → Manage hardware → Storage complexes**.
2. In the **Select Action** drop-down list, select **Add Storage Complex**, and then click **Go**. The Add Storage Complex page is displayed.
3. In the **Management console 1 IP address** field, enter the IP address of the storage complex that you want to add.
4. If you want to add another storage complex, check the **Define a second management console** box.
5. If you checked the **Define a second management console** box, enter the IP address of the second storage complex that you want to add.
6. Click **OK**. The storage complex or complexes that you added will be available for selection when you return to the Storage complexes main page.

---

## Adding a 2105 Copy Services domain (real-time only)

Complete this task to specify the IP addresses for adding 2105 Copy Services domains to the storage complex.

1. In the navigation, select **Real-time manager → Manage hardware → Storage complexes**.
2. In the **Select Action** drop-down list, select **Add 2105 Copy Services Domain**, and then click **Go**. The Add 2105 Copy Services Domain page is displayed.
3. In the **Server 1 IP address** field, enter the IP address for the target Copy Services server that you want to add.
4. If you need to add a second server, check the **Define a second Copy Services server** box.
5. If you checked the **Define a second Copy Services server** box, enter the IP address of the second Copy Services server that you want to add.
6. Click **OK** to complete the process or **Cancel** to terminate it.

---

## Assigning a storage unit to a storage complex (real-time only)

Complete this task to assign a storage unit to the selected storage complex and specify the appropriate network settings.

This process must be done from the primary management console. You must make a selection in the table to enable this option.

To complete this task, you must know your machine's serial number. See *Locating the serial number, model, and signature*.

**Note:** Before you configure, disable any firewalls, as they might interfere with DS6000 communication.

1. In the navigation, select **Real-time manager** → **Manage hardware** → **Storage complexes**. On the storage complexes main page, select the appropriate storage complex from the table.
2. From the **Select Action** menu, select **Assign Storage Unit**, and then click **Go**. The Assign Storage unit — Storage unit properties page is displayed.
  - a. Enter a Nickname.
  - b. Optionally, enter a description.
  - c. Enter the IP address of processor cards 1 and 2.
  - d. The machine type is already generated, but you must enter the 7-digit serial number, without hyphens, from the MTMS label on the flange on the front right side of the enclosure at the right front bezel. See *Locating the serial number, model, and signature*.
3. Click **Next**. The Network settings page is displayed.
4. Specify the appropriate network settings and then click **Next**. The Verification page is displayed.
  - a. Enter a gateway.
  - b. Enter a subnet mask.
  - c. Enter the primary DNS address.
  - d. Enter the secondary DNS address.
  - e. If necessary, enter a different Max transmission units value. This is the maximum rate for transmission. The valid range is 1 to 9000 bytes. The default is 1500 bytes, which is appropriate in most cases.
5. Verify the attributes and values for the newly configured Storage unit. Click **Finish** if the settings are correct.

If you are setting up the DS Storage Manager, return to Setting up the DS Storage Manager and complete the rest of the steps.

---

## Attempting connection to a storage complex (real-time only)

Complete this task to connect to a storage complex from the list of complexes.

1. In the navigation, select **Real-time manager** → **Manage hardware** → **Storage complexes**.
2. On the Storage complexes main page, select the complex that you want to connect to.
3. In the **Select Action** drop-down list, select **Attempt Connection**, and then click **Go**.
4. The table refreshes, and the updated status displays in the **Status** column.

---

## Unconfiguring modem phone numbers (real-time only)

Complete this task to remove modem phone numbers to allow VPN connection through the Internet.

If a modem was previously configured but you now want to create a VPN connection through the Internet, you must first remove all previously completed fields from the Configure Modem Remote Support page. If the modem has been configured with phone numbers to dial, the DS Storage Manager only uses the modem to create a VPN connection. If the modem connection fails for any reason, there can be no IBM remote support connection. The program does not attempt to connect using VPN over the Internet.

Perform these steps to remove modem phone numbers to initiate a virtual private network (VPN) connection through the Internet. IBM can use this connection to perform remote support on your DS6000.

1. In the navigation, under **Real-time manager**, select **Manage hardware** and then select **Storage complexes**. Select **Configure Modem Remote Support** from the **Select Actions** list and click **Go**.
2. Clear all entries from the telephone number fields, leaving the fields empty.
3. Click **OK** to permanently remove the information. The next VPN connection that you initiate will use the Internet.

---

## Removing a storage complex (real-time only)

Complete this task to remove one or more storage complexes from the list of complexes.

1. In the navigation, select **Real-time manager** → **Manage hardware** → **Storage complexes**.
2. On the Storage complexes main page, select the complex or complexes that you want to remove.
3. In the **Select Action** drop-down list, select **Remove from list**, and then click **Go**. A confirmation message is displayed.
4. Click **OK** to complete the process of removing the complexes. Click **Cancel** to cancel the removal process.

---

## Deleting storage complexes (simulated only)

Complete this task to delete storage complexes.

You must make a selection in the table to enable this option.

1. In the navigation, select **Simulated manager** → **Manage hardware** → **Storage complexes**.
2. On the Storage complexes main page, select the storage complex or complexes that you want to delete.
3. In the **Select Action** drop-down list, select **Delete**, and then click **Go**. A confirmation dialog box is displayed.
4. Specify whether you want to delete just the settings for the storage complex or all of the simulated storage units in the storage complex as well. A second confirmation dialog is displayed.
5. Confirm the deletion to complete the process.

---

## Viewing and modifying properties

Complete this task to access properties pages so that you can review or modify the properties.

1. In the main page of the target subject area (for example, Host Systems), select an item in the table.
2. In the **Select Action** drop-down list, select **Properties** and then **Go**. The properties page for the selected item is displayed.
3. If the properties page is solely informational, the only button option is **OK**. Click it to close the page. If the properties page has attributes that you can modify, the button options are **OK** or **Apply**. Click **OK** to apply the changes and close the page. Click **Apply** to apply the changes and leave the page open.



---

## Chapter 9. Storage units

The topics in this category present information related to working with storage units. Information on the storage units pages is in the Reference section.

---

### Importing a storage unit (simulated only)

Complete this task to import a storage unit from a storage complex or a Management console. When you complete this process, a storage unit is automatically created for the storage unit.

1. In the navigation, select **Simulated manager** → **Configure storage** → **Storage units**.
2. In the **Select Action** drop-down list, select **Import**, and then click **Go**. The Import Storage Unit — Identify storage complex page is displayed.
3. Click **Next** to continue. The Storage unit page is displayed.
4. In the Identify storage complex page, you connect directly to a storage complex to collect the physical configuration of the desired storage unit.
  - a. If you select the **Select a previously defined storage complex** radio button, you must either select a storage complex by nickname from the selection box or enter the information for the Management console.
  - b. If you select the **Enter Management console IP address** radio button, the next three fields are activated. You must enter values in the fields.
5. After you have identified the storage complex, click **Next** to continue. The Select storage unit to import page is displayed.
6. In the Select storage unit to import page, you select the specific storage units to import. Select from the list of storage units and one of the following radio buttons.
7. Click **Next** to continue. The General storage unit information page is displayed.
8. In the General storage unit information page, you define general information. This page repeats for each of the selected storage units. Specify a nickname and description for each unit. Click **Next** to continue. The Verification page is displayed.
9. Use the Verification page to review the established attributes and verify that they are correct.
10. If the attributes and values are not correct, click **Back** as appropriate to return and specify the correct values. Otherwise, click **Finish** to complete the storage unit import process.

---

### Creating a storage unit (simulated only)

Complete this task to create a simulated storage unit and to specify its attributes and properties.

1. In the navigation, select **Simulated manager** → **Manage hardware** → **Storage units**.
2. From the **Select Action** menu, select **Create...**, and then click **Go**. The Create Storage Unit — General storage unit information page is displayed.
3. In the General storage unit information page, you must specify the machine type and nickname. The other fields are optional. You can enter the **Select**

**storage complex** value now or modify the storage unit properties later. If you want to create a new storage complex, click the **Create new storage complex** button. The new complex is listed for your selection after you finish the creation wizard process.

4. Click **Next** to continue.
5. The Create Storage Unit — Specify DDM packs page is displayed. You must specify the **Quantity of DDM packs** and the **DDM type**. Click **Add**, and then click **Next** to continue. The Define licensed function page is displayed.
6. In the Define licensed function page, you must specify a value in the **Operating Environment License (TB)** field. You can optionally specify values in the remaining four fields as appropriate. After you enter the necessary values, click **Next** to continue.

The **Operating Environment License (TB)** value is the total amount of capacity in the box. If you specify more than one storage unit, the license is split equally between the two storage units.

7. If you specified a license for the FlashCopy or Remote Mirror and Copy functions, you must specify the storage type (FB, CKD, or All types) for each of the Copy Services functions. Once you have defined the storage type, click **Next**.
8. The Verification page is displayed. Use this page to review the established attributes and verify that they are correct. If the attributes and values are not correct, click **Back** as appropriate to return and specify the correct values. Otherwise, click **Finish** to complete the storage unit creation process.

If you are setting up the DS Storage Manager, return to Setting up the DS Storage Manager and complete the rest of the steps.

---

## Modifying storage unit nicknames and descriptions (real-time only)

Complete this task to view properties for the selected storage unit and optionally modify the nickname and description.

1. In the navigation, select **Real-time manager** → **Manage hardware** → **Storage units**. On the Storage units — Main page, select the appropriate storage unit.
2. In the **Select Action** drop-down list, select **Configure**, and then click **Go**. The Storage unit properties page is displayed.
3. View current storage unit properties and optionally modify the nickname and description.
4. Click **Apply** to save any changes and stay on the current page, or click **OK** to save and close.

---

## Applying activation codes

Complete this task to apply the activation codes that enable you to begin configuring storage on a storage unit.

### Notes:

1. The initial enablement of any optional DS6000 licensed function is a concurrent activity (assuming that the appropriate level of microcode is installed on the machine for the given function). The following activating activities are disruptive and require a machine initialization or reboot:
  - Removal of a DS6000 licensed function to deactivate the function. Contact your IBM service representative to perform this operation.



- A lateral change or reduction in the license scope. A lateral change is defined as changing the license scope from fixed block (FB) to count key data (CKD) or from CKD to FB. A reduction is defined as changing the license scope from all physical capacity (ALL) to only FB or only CKD capacity.
2. Before you begin this task, you must resolve any current open problems.
  3. Before you configure, disable or provide paths through any firewalls, because they might interfere with DS6000 communication.

The easiest way to apply the feature activation codes is to download the activation codes from the IBM Disk Storage Feature Activation (DSFA) Web site to your local computer and then to import the file into the DS Storage Manager. If you cannot access the DS Storage Manager from the same computer that you used to access the DSFA Web site, you can download the file to a diskette or write down the information. If you are using either of these latter methods, ensure that you have your diskette containing the downloaded activation codes file or your paper that contains the written activation codes before you begin the following steps.

1. Ensure that the Import activation codes page is not open. You cannot have both the Apply activation codes page and the Import activation codes page open at the same time. You must close one in order to access the other.
2. In the navigation, select **Real-time manager** → **Manage Hardware** → **Storage units**. On the Storage units main page, select the storage unit that you want to import the activation code for.
3. From the **Select Action** menu, select **Configure...**, and then click **Go**. The Storage unit properties page is displayed. Click on the **Activation codes** tab. The Activation codes page is displayed.
  - a. If you already imported your activation codes from a file or retrieved existing codes from the storage unit, the values are displayed in the fields and you can modify or overwrite them, as appropriate.
  - b. If you are importing your activation codes from a file that you downloaded from the DSFA Web site, click **Import key file**. Once you complete the import process, the data from the file is displayed.
  - c. If you did not download your activation codes into a file, enter the codes into the appropriate fields.

**Note:** The **Capacity** and **Storage type** fields are populated based on the information that is contained within the activation codes.

4. Click **OK** to complete the process.

---

## Importing activation codes

Complete this task to import the activation codes that must be applied before you can begin configuring storage on a storage unit.

### Notes:

1. Before you begin this task, you must resolve any current open problems. See the Troubleshooting section of the IBM System Storage DS6000 Information Center for additional information. If you need additional assistance to resolve these problems, contact IBM Support.
2. Before you configure, disable or provide paths through any firewalls, because they might interfere with DS6000 communication.

Perform the following steps to import your activation codes:

1. In the navigation, select **Real-time manager** → **Manage Hardware** → **Storage units**. On the Storage units main page, select the storage unit that you want to import the activation code for.
2. From the **Select Action** menu, select **Configure**, and then click **Go**. Select the **Activation codes** tab. The Apply activation codes page is displayed.
3. Click **Import key file**. The Import page is displayed.
4. In the **Select file to import** field, specify the target file. Use the **Browse** button to navigate to the appropriate directory.
5. After you have specified the code file, click **OK** to complete the process.

---

## Specifying storage unit day and time (real-time only)

Complete this task to specify date, time, time zone, and Daylight Saving time observation setting for the selected storage unit.

**Important:** The date and time on the storage unit must be set correctly and must match the date and time settings on the management console. If this information is not set correctly, the error logs for the storage unit will not be correct.

You must make a selection in the table to enable this option.

To specify storage unit day and time, perform the following steps:

1. In the navigation, select **Real-time manager** → **Manage hardware** → **Storage units**. Select the appropriate storage unit.
2. In the **Select Action** list, select **Configure**, and then click **Go**. The Storage unit properties page is displayed.
3. In the navigation on the left, click the **Date and time** tab. The Date and time zone page is displayed.
4. Specify the date, time, and time zone for the selected storage unit.
5. Click **OK** to save and close.

If you are setting up the DS Storage Manager, return to Setting up the DS Storage Manager and complete the rest of the steps.

---

## Reviewing storage unit network settings (real-time only)

Complete this task to view properties for the selected storage unit and optionally modify the nickname and description.

You must make a selection in the table to enable this option.

To review storage unit network settings, perform the following tasks:

1. In the navigation, select **Real-time manager** → **Manage hardware** → **Storage units**. On the Storage units — Main page, select the appropriate storage unit.
2. From the **Select Action** menu, select **Configure**, and then click **Go**. The Storage unit properties page is displayed.
3. In the navigation on the left, click the **Network settings** tab. The Network settings page is displayed.
4. Review the IP addresses and host names for the selected storage unit.
5. Optionally modify the nickname and description.

6. Click **OK** to save and close.

If you are setting up the DS Storage Manager, return to Setting up the DS Storage Manager and complete the rest of the steps.

---

## Applying a configuration (simulated only)

Complete this task to select, authenticate, and apply a storage unit configuration.

Ensure that you have obtained and applied an Operating Environment License with a maximum storage amount that exceeds the amount of storage that you have configured in your simulated configuration.

The source storage unit must have defined a logical configuration and hosts before you can apply a configuration.

To apply a configuration in simulated mode, perform the following steps:

1. In the navigation, select **Simulated manager** → **Manage hardware** → **Storage units**.
2. From the **Select Action** list, select **Apply configuration...**, and then click **Go**. The Apply Configuration — Select application method page is displayed.
3. In the Select application method page, specify the method with which to apply the configuration.
  - a. If you choose **Select from a list of storage complex**, the Select storage complex page of this wizard is displayed with the storage complexes in your simulated environment. Click **Next** to continue and go to step 3.
  - b. If you choose **Import new storage complex** the Import storage complex wizard is displayed. Once you finish with the wizard, the Select storage unit page is displayed with the storage units from the imported storage complex. You must be connected to the network to import the storage complex. Click **Next** to continue and go to step 5.
  - c. If you choose the **Apply configuration without importing storage complex** option, the Authenticate page is displayed. Click **Next** to continue and go to step 4.
4. Use the Select storage complex page to connect directly to a storage unit. Click **Next** to continue. The Authenticate page is displayed.
5. In the Authenticate page, connect to and authenticate a storage complex by defining management console properties. You must provide a user ID and password to complete the authentication. Click **Next** to continue. The Select storage unit page is displayed.
6. On the Select storage unit page, you connect directly to a storage unit. Specify the values as appropriate and click **Next**.
7. Use the Verification page to review the attributes and verify that they are correct.
8. If the attributes and values are not correct, click **Back**, as appropriate, to return and specify the correct values. Otherwise, click **Finish** to complete the apply configuration process.

If you are creating a new logical storage configuration, return to Creating a custom logical storage configuration and complete the rest of the steps.

---

## Configuring I/O ports

Complete this task to change the configuration for I/O ports that have host attachments assigned to them.

1. In the navigation, select **Real-time manager or Simulated manager** → **Manage hardware** → **Storage units**. On the Storage units — Main Page, select a Storage unit.
2. From the **Select Action** menu, select **Configure I/O Ports...**, and then click **Go**. The Configure I/O Ports page is displayed.
3. Use the check boxes to select one or more host attachments of the same type.
4. From the **Select Action** menu, select the I/O port type that you want to change to. You can change any I/O port to FcAl , FcSf , or FICON.

### FICON

Select this if you plan to connect one or more S/390 hosts using a FICON S/390 channel to the DS6000 either directly or through a FICON switch.

**FcSf** Select this if you plan to connect one or more open systems hosts to the DS6000 through a fabric switch, or if you plan to connect one or more S/390 hosts running LINUX on an FCP S/390 channel.

**FcAl** Select this if you plan to connect an open systems host directly to the DS6000 without going through a fabric switch.

5. Click **Go**. The table will update with the attachment type that you selected.

If you are setting up the DS Storage Manager, return to Setting up the DS Storage Manager and complete the rest of the steps.

---

## Changing iSeries serial numbers

Complete this task to change the serial number of an iSeries volume on a storage unit.

1. In the navigation, select **Real-time manager or Simulated manager** → **Manage Hardware** → **Storage units**. On the Storage units main page, select a storage unit.
2. In the **Select Action** drop-down list, select **Change iSeries Serial Number**, and then click **Go**. The Change iSeries Serial Number page is displayed.
3. In the **New iSeries Serial Number** field, enter the new serial number. You can only use characters from 0 - 9 and A - F, and you cannot use the value 000.

**Note:** You must enter a unique serial number that is not already assigned to an existing volume.

4. After you have entered the new serial number, click **OK** to complete the process.

---

## Deleting storage units (simulated only)

Complete this task to delete storage units.

This process must be done from the primary Management Console. You must make a selection in the table to enable this option.

1. In the navigation, select **Simulated manager** → **Manage hardware** → **Storage units**. On the Storage units — Main page, select the storage unit or units that you want to delete.

2. In the **Select Action** drop-down list, select **Delete**, and then click **Go**. A confirmation dialog box is displayed.
3. Confirm the action to complete the deletion of the selected storage units.

---

## Modifying a storage unit (simulated only)

Complete this task to modify the properties and attributes of an established storage unit.

1. In the navigation, select **Simulated manager** → **Manage hardware** → **Storage units**. On the Storage units — Main page, select the storage unit that you want to modify.
2. In the **Select Action** drop-down list, select **Modify...**, and then click **Go**. The Create Storage Unit — General storage unit information page is displayed.
3. In the General storage unit information page, you can modify only the nickname, description, and storage complex values without affecting any logical configuration for the unit. If you modify the type-model, any and all logical configuration is deleted. If you attempt to modify the type-model, a message indicates that all configuration is to be deleted. Complete your modifications and click **Next** to continue. The Specify DDM packs page is displayed. You must specify values for **Quantity of DDM packs** and **DDM type**. Click **Add**, then click **Next** to continue. The Define licensed function page is displayed.
4. If you modify anything on the Define licensed function page or the following pages (, Licensed function details, and Specify DDM packs), any and all logical configuration is deleted. If you attempt to make modifications, a message indicates that all configuration is to be deleted. Click **Next** to continue to the Verification page.
5. Use the Verification page to review the established attributes and verify that they are correct.
6. If the attributes and values are not correct, click **Back** as appropriate to return and specify the correct values. Otherwise, click **Finish** to complete the storage unit modification process.

---

## Removing a storage unit from a storage complex (real-time only)

Complete this task to remove a storage unit from a storage complex.

This task enables you to immediately remove a storage unit from a storage complex.

1. In the navigation, select **Real-time manager** → **Manage hardware** → **Storage units**.
2. In the **Select Action** drop-down box, select **Remove from Storage complex**, and then click **Go**. A warning message is displayed.
3. Click **Continue** to remove the Storage unit, or click **Cancel** to retain the Storage unit. If you choose to continue with the Storage unit removal, a confirmation message is displayed.
4. Confirm that you want to remove the Storage unit. The Storage unit is no longer displayed in the Storage complex list.

---

## Sending problem determination data (real-time only)

Complete this task to collect a problem determination data file from the storage unit. You can send it to IBM technical support, save a copy to your local workstation, or delete it.

1. In the navigation, select **Real-time Manager**, **Manage Hardware**, and then **Storage units**.
2. Select the appropriate storage unit.
3. In the **Select Action** drop-down list, select **Copy and Send Problem Determination Data** and then **Go**. The Collect New PD Files page is displayed.
4. Select the type of information that you want to collect. You can select Traces, Dumps, or both file types. Select traces as the default option. The dumps option is primarily used if you are being instructed to do so by IBM technical support.
5. Type a description for the problem determination data file set that you are creating. This description is saved with the file set and can help distinguish the file set from other file sets. You must provide a description before you can proceed to the next step. You can edit this information in the Manage/Send Existing PD Files page.
6. Click **Copy**. The system collects and copies Traces (PE packages) and Dumps (statesaves) into files and displays them in the form of hyperlinks that can be managed from the Manage/Send Existing PD Files page. Click on the hyperlink to display additional information about the file set.

**Note:** You can also select file sets and click the **Save to Local disk** button or the **Delete** button.

7. Navigate to the Manage/Send Existing PD Files page. The table at the top of this page lists the problem determination data file sets that you created from the Collect New PD Files page.
8. Select the problem determination data file sets that you want to send to IBM technical support.
9. Click the **Send to IBM support** button to send the selected files to IBM technical support.

**Note:** To modify the description that you provided earlier, click on the file name hyperlink in the table and click **Edit description**.

---

## Activating remote support (real-time only)

Complete this task to initiate a virtual private network (VPN) remote support connection through your local area network or through a dial-up modem.

This task enables you to connect to IBM for support. The modem always initiates the VPN connection if there are phone numbers that are configured on the Configure modem remote support page. If you want to initiate a VPN connection through your local area network, you must unconfigure the modem phone numbers. Follow the steps in “Unconfiguring modem phone numbers (real-time only)” on page 64 to enable a local area network VPN connection.

**Note:** Prior to starting the VPN session, notify the support organization that a VPN connection will time out after a period of time with no activity.

Perform the following steps to active remote support:

1. In the navigation, select **Real-time Manager** → **Manage Hardware** → **Storage units**. Select the appropriate storage unit from the table. From the **Select Action** list, select **Activate remote support** and then click **Go**. The Activate remote support page is displayed.
2. Click **Connect**. The connection to IBM support is established. An IBMVPN connection icon is displayed in the system tray of the management console. When you are finished using the VPN connection, right-click on the system tray icon and select **Disconnect** to close the connection.

**Note:** If the IBMVPN connection icon is not in the system tray of the management console, contact IBM support.

---

## Viewing status (real-time only)

Complete this task to view the status of the elements in the active page.

1. In the **Select Action** drop-down list, select **Status....**
2. Next, select **Go**. The status page is displayed.
3. Click on the **Refresh** button to have the browser refresh and display current data.
4. Terminate the status page by clicking on the **OK** button or on the x in the page bar.

---

## Viewing and modifying properties

Complete this task to access properties pages so that you can review or modify the properties.

1. In the main page of the target subject area (for example, Host Systems), select an item in the table.
2. In the **Select Action** drop-down list, select **Properties** and then **Go**. The properties page for the selected item is displayed.
3. If the properties page is solely informational, the only button option is **OK**. Click it to close the page. If the properties page has attributes that you can modify, the button options are **OK** or **Apply**. Click **OK** to apply the changes and close the page. Click **Apply** to apply the changes and leave the page open.

---

## Upgrading the DS6000 code level

Complete this group of tasks to locate, download, and install code upgrades for your storage unit, DS Storage Manager, and DS CLI. You can perform either a concurrent (DS6000 has current I/O activity) or nonconcurrent (no current I/O activity on the DS6000) code load.

If you are performing a concurrent code upgrade, you must first ensure that all host paths are available and operating correctly. During a concurrent code upgrade, the storage unit host ports temporarily lose their connections for each processor card when that card is upgraded. Before you begin a concurrent code upgrade, ensure that each host has a path to each processor card to prevent a lost connection between the host and the storage unit. If the host does not have a path to each processor card, the paths from the host to the storage unit are lost during the code upgrade.

**Note:** While each host port is temporarily unavailable during the code upgrade, I/O operations from a host can cause errors to be logged stating that the



path is lost. Error message activity can make the host interface unavailable for other host system administration tasks during the code upgrade.

The DS6000 operates its various components with upgradeable code (or firmware). This code governs the operation of the various parts of the unit, such as the device adapters, host adapters, processor cards, and other advanced function features. As IBM continues to develop and improve this code, code updates will be available to you.

Perform the following steps for each storage unit that is connected to the DS Storage Manager.

1. Check for firmware updates. Follow the instructions in Checking for code updates (real-time only). If you are not required to upgrade your code, stop here.
2. To upgrade the code successfully, before you proceed with the code upgrade you must ensure that no alert LEDs are illuminated and that there are no open problems in the problem logs. Correct any problems before you proceed with the firmware upgrade. You can correct problems by performing the steps in either Following a light path to perform unguided service or Performing guided service through the problem log.
3. Obtain the downloadable files from the DS6000 support Web site. Follow the instructions in Downloading code updates.
4. Install the code update on your storage unit. Follow the instructions in Installing code upgrades (real-time only). You must perform this step for each storage unit that is managed by your DS Storage Manager before you proceed to the next step.
5. Upgrade the DS Storage Manager. Begin the installation of the new DS Storage Manager by completing one of the following sets of steps:
  - If you are installing from the ZIP file bundle, follow these steps:
    - a. Extract the DS Storage Manager ZIP folder that is located in the file path where you extracted the ZIP file bundle information.
    - b. Navigate to the folder that you just extracted and run setup.exe. You can perform the upgrade using either the graphical mode or silent mode. See Upgrading the DS Storage Manager on a Windows operating system using the graphical mode or Upgrading the DS Storage Manager on the Windows operating system in unattended (silent) mode for the steps. When the installation is complete, a prompt to restart might be displayed. If possible, do not restart at this time. You will perform a restart after you install the DS CLI upgrade.
  - If you are installing from the ISO image that you used to create an installation CD, insert the CD and navigate to the DS Storage Manager installation files and run setup.exe. You can perform the upgrade using either the graphical mode or silent mode. See Upgrading the DS Storage Manager on a Windows operating system using the graphical mode or Upgrading the DS Storage Manager on the Windows operating system in unattended (silent) mode for the steps. When the installation is complete, a prompt to restart might be displayed. If possible, do not restart at this time. You will perform a restart after you install the DS CLI upgrade.
6. Perform the following steps to upgrade the DS CLI:
  - a. Begin the installation of the new DS CLI by completing one of the following sets of steps:
    - If you are installing from the ZIP file bundle, follow these steps:



- 1) Extract the DS CLI ZIP folder that is located in the file path where you extracted the ZIP file bundle information.
- 2) Navigate to the folder that you just extracted. To install using graphical mode, run the file setupwin32.exe. To install using console mode, run the file setupwin32console.exe.
  - If you are installing from the ISO image that you used to create an installation CD, insert the CD and navigate to the DS CLI installation files. To install using graphical mode, run the file setupwin32.exe. To install using console mode, run the file setupwin32console.exe.
- b. Follow the instructions for upgrading the DS CLI. See Installing the DS CLI using the graphical mode or Installing the DS CLI using the console mode to perform the upgrade using either the graphical mode or console mode.
7. If you have not already done so, restart your management console.
8. After the DS Storage Manager is installed, use Storage units — Main page to verify that you can view the status of the storage complex and its associated logical configuration. In the navigation, select **Real-time manager** → **Manage hardware** → **Storage units**. On the Storage units - Main Page, select the appropriate storage unit.
9. Ensure that no alert LEDs are illuminated and that there are no open problems in the problem logs. Correct any problems. You can correct problems by performing the steps in either Following a light path to perform unguided service or Performing guided service through the problem log.

If you are setting up the DS Storage Manager, return to Setting up the DS Storage Manager and complete the rest of the steps.

---

## Setting up Call Home, SNMP, and SIM notifications (real-time only)

Complete this task to configure your Call Home (SMTP or modem), SNMP, and zSeries Service Information Message (SIM) notifications.

You must define your customer contact information before configuring notifications, or you will be unable to set up the SMTP server.

The Call Home feature allows the transmission of operational and error-related data to IBM. It provides the ability for the storage unit to alert IBM support to machine conditions. The SNMP feature generates alert messages and sends them to your designated location.

**Important:** When you configure the Call Home feature, you must provide complete, accurate, up-to-date contact information, including the correct telephone number. Incomplete or incorrect contact information can cause a delay in the IBM response to a Call Home event. If your contact information changes after you initially configure Call Home (for example, if you move the DS6000 to a new location) be sure to update your customer contact information.

### Notes:

1. The management console does not process SNMP messages. You are responsible for installing additional SNMP alert software to process these messages.
2. You must enable your SMTP server to relay SMTP messages from your DS6000.

To define Call Home (SMTP or modem), SNMP, and zSeries SIM (service information message) notifications for a storage unit, perform the following steps:

1. In the navigation, select **Real-time manager** → **Manage hardware** → **Storage units**.
2. From the **Select Action** menu, select **Configure notifications**, and then click **Go**. The Configure notifications — Define Call Home page is displayed.
3. Ensure that **Enable Call Home** is selected to activate the Call Home function. (This is checked by default.) You can also optionally check the **Enable Modem Call Home** box if you want to send Call Home notifications through your modem connection. You must have a modem installed and configured if you want to use this function. If both the **Enable Call Home** and **Enable Modem Call Home** boxes are selected, Call Home notifications are first sent through the modem connection and then through the SMTP connection if the modem connection is unsuccessful.
4. Complete the following SMTP information:
  - a. Enter the SMTP server host name (for example, server.company.com).
  - b. Enter the SMTP IP address (for example, 123.456.7.89). This must be an IP address that the storage unit can reach.
  - c. Enter the SMTP server port (for example, 25). It is recommended that this port not be changed from the default port (25). Changing the port number can cause the Call Home feature to not work.
  - d. Click **Apply**.
5. Click **Test Call Home connection** to send a connection test and generate a problem log entry. A confirmation message is displayed. Click **Ok**.
6. Click the **SNMP** tab. The Define SNMP connection page is displayed.
7. Select **Enable SNMP notification** to define the SNMP connection properties for the selected storage units.
8. Specify either an IP address, a Host name, or both under SNMP trap destination.
9. Specify an SNMP community name of up to 32 characters. This field is used to authenticate requests. 'public' is selected by default.
10. (Optional) Specify an SNMP system contact name of up to 32 characters.
11. Enter a destination port.
12. Click **Apply**.
13. Click the **zSeries** tab. The Define SIMs for zSeries page is displayed.
14. (Optional) Select a SIM severity level in the Severity reporting level for DASD Service Information Messages (SIMs) field.
  - **Acute**: An irrecoverable error with possible loss of data. Use this severity level only for DASD SIMs.
  - **Serious**: An irrecoverable error or a data check with loss of access to data.
  - **Moderate**: A system path is not operational and performance might be degraded. This severity level does not apply to media SIMs.
  - **Service**: A recoverable error, equipment checks, or data checks. You can defer repair.
  - **None**: No messages will be sent.
15. (Optional) Select the Maximum number of additional times a DASD Service Information Message is to be sent [0-5].
16. (Optional) Select a Media Service Information severity level in the Severity reporting level for Media Service Information Messages field.

17. (Optional) Select the Maximum number of additional times a Media Service Information Message is to be sent [0-5].
18. (Optional) Select a Service Information severity level in the Severity reporting level for a storage unit Service Information Messages field.
19. (Optional) Select the Maximum number of additional times a storage unit Service Information Message is to be sent [0-5].
20. Click **Ok**.

If you are setting up the DS Storage Manager, return to Setting up the DS Storage Manager and complete the rest of the steps.

---

## Defining customer contacts (real-time only)

Complete this task to add or modify shipping or contact information for a customer account.

**Important:** When you configure the Call Home feature, you must provide complete, accurate, up-to-date contact information, including the correct telephone number. Incomplete or incorrect contact information can cause a delay in the IBM response to a Call Home event. If your contact information changes after you initially configure Call Home (for example, if you move the DS6000 to a new location) be sure to update your customer contact information.

To define customer contacts, perform the following steps:

1. In the navigation, select **Real-time manager** or **Simulated manager** → **Manage hardware** → **Storage units**. On the Storage units — Main page, select the appropriate storage unit.
2. From the **Select Action** list, select **Customer contact**, and then click **Go**. The Customer account information tab is displayed.
3. Create or modify the customer account information. Required fields are indicated by an asterisk (\*). Fill in all required fields or you will be unable to set up the SMTP server. You are required to enter information in the Business/company name field.
4. Click the Contact information tab and add or modify contact information for the customer.
5. Click the Shipping information tab and add or modify shipping information for the customer.
6. Click the **OK** button to complete the customer contact information.

If you are setting up the DS Storage Manager, return to Setting up the DS Storage Manager and complete the rest of the steps.



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## Accessibility

Accessibility features provide users who have disabilities with the ability to successfully access information and use technology.

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully.

### Features

These are the major accessibility features in the IBM System Storage DS6000 information:

- You can use screen-reader software and a digital speech synthesizer to hear what is displayed on the screen. IBM Home Page Reader version 3.0 has been tested.
- You can operate features using the keyboard instead of the mouse.

### Navigating by keyboard

You can use keys or key combinations to perform operations and initiate menu actions that can also be done through mouse actions. You can navigate the IBM System Storage DS6000 information from the keyboard by using the shortcut keys for your browser or Home Page Reader. See your browser Help for a list of shortcut keys that it supports. See the following Web site for a list of shortcut keys supported by Home Page Reader: [http://www-306.ibm.com/able/solution\\_offerings/keyshort.html](http://www-306.ibm.com/able/solution_offerings/keyshort.html)

### Accessing the publications

You can find HTML versions of the IBM System Storage DS6000 information at the following Web site: <http://www.ehone.ibm.com/public/applications/publications/cgi-bin/pbi.cgi>

You can access the information using IBM Home Page Reader 3.0.

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VS07171L

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