

Hitachi Unified Storage Command Line Interface Reference Guide

FASTFIND LINKS

Changes in this revision

Changes in this revision

Document Organization

Contents

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or stored in a database or retrieval system for any purpose without the express written permission of Hitachi, Ltd. and Hitachi Data Systems Corporation (hereinafter referred to as “Hitachi”).

Hitachi, Ltd. and Hitachi Data Systems reserve the right to make changes to this document at any time without notice and assume no responsibility for its use. Hitachi, Ltd. and Hitachi Data Systems products and services can only be ordered under the terms and conditions of Hitachi Data Systems' applicable agreements.

All of the features described in this document may not be currently available. Refer to the most recent product announcement or contact your local Hitachi Data Systems sales office for information on feature and product availability.

Notice: Hitachi Data Systems products and services can be ordered only under the terms and conditions of Hitachi Data Systems' applicable agreements. The use of Hitachi Data Systems products is governed by the terms of your agreements with Hitachi Data Systems.

Hitachi is a registered trademark of Hitachi, Ltd. in the United States and other countries. Hitachi Data Systems is a registered trademark and service mark of Hitachi in the United States and other countries.

All other trademarks, service marks, and company names are properties of their respective owners.

- France – Import pending completion of registration formalities
- Hong Kong – Import pending completion of registration formalities
- Israel – Import pending completion of registration formalities
- Russia – Import pending completion of notification formalities
- Distribution Centers – IDC, EDC and ADC cleared for exports



Contents

Preface	xxvii
Intended audience	xxviii
Product version	xxviii
Document revision level	xxviii
Changes in this revision	xxviii
Document Organization	xxix
Related documents	xxx
Document conventions	xxxi
Convention for storage capacity values	xxxii
Accessing product documentation	xxxiii
Getting help	xxxiii
Comments	xxxiii
1 Introduction	1-1
Overview of Storage Navigator Modular 2	1-2
Features	1-2
Software applications and HSNM2 features	1-4
2 Navigator 2 installation	2-1
Connecting Navigator 2 to the host	2-2
CLI Installation Caveats	2-2
System requirements	2-4
Windows server	2-4
Virtual OS	2-5
Solaris™ (SPARC)	2-5
Solaris™ (x86, 32 Bits OS))	2-6
HP-UX	2-6
AIX	2-6
Linux	2-7
LAN Connection	2-7
Port Number of TCP/IP	2-7

IPv6 supported platforms	2-8
Installing Storage Navigator Modular 2	2-10
Windows	2-10
Solaris (SPARC and x86 32 Bits OS)	2-10
Red Hat Linux	2-11
Setting Linux Kernel Parameters.	2-12
HP-UX	2-14
AIX	2-15
IRIX	2-15
Updating Storage Navigator Modular 2	2-16
Windows	2-16
Solaris (SPARC and x86 32 Bits OS)	2-17
Red Hat Linux	2-17
HP-UX	2-17
AIX	2-17
IRIX	2-17
Uninstalling	2-17
Windows	2-18
Solaris, IRIX, HP-UX, AIX, and Red Hat Linux	2-18
 3 CLI command list	 3-1
Overview	3-2
Examples of output for selected commands.	3-10
Example of auiscsi output	3-10
Example of audrive output.	3-11
Example of auportop output	3-11
Notes at the time of functional operation	3-17
Logical units formatting.	3-17
Logical units creation (format is specified).	3-18
Logical units format	3-18
Logical units expansion	3-18
Importing the constitute information.	3-18
Mapping Mode	3-19
Command specifications	3-19
Command format and command types	3-19
Standard commands	3-19
Administration commands	3-20
Displaying command syntax.	3-20
Command help.	3-21
Setting the TCP/IP port number	3-22
Commands for registering an array	3-23
Displaying the registration information	3-24
Command name	3-24
Format.	3-24

Description	3-24
Options	3-24
Automatic registering	3-25
Command name	3-25
Format	3-25
Description	3-25
Options	3-26
Registering	3-27
Command name	3-27
Format	3-27
Description	3-28
Options	3-28
Changing registration information	3-30
Command name	3-30
Format	3-30
Description	3-30
Options	3-31
Examples	3-31
Deleting the registration information	3-32
Command name	3-32
Format	3-32
Description	3-32
Options	3-33
Examples	3-33
Displaying array status	3-34
Displaying a firmware revision	3-35
Command name	3-35
Format	3-35
Description	3-35
Options	3-35
Example	3-35
Displaying drive configuration information	3-36
Command name	3-36
Format	3-36
Description	3-36
Options	3-36
Examples	3-36
Displaying the cache configuration information	3-38
Command name	3-38
Format	3-38
Description	3-38
Options	3-38
Example	3-38

Displaying the status of power supply/fan/battery/loop/ENC	3-39
Command name	3-39
Format.	3-39
Options	3-39
Example.	3-40
Displaying the status of component parts	3-41
Command name	3-41
Format.	3-41
Description.	3-41
Options	3-41
Examples	3-41
Referencing the parts options	3-49
Command name	3-49
Format.	3-49
Description.	3-50
Options	3-50
Example.	3-50
Displaying the current IP address.	3-51
Command name	3-51
Format.	3-51
Description.	3-51
Options	3-51
Displaying the information messages	3-52
Command name	3-52
Format.	3-52
Description.	3-52
Options	3-52
Example.	3-52
Referencing/setting the equipment ID or controller ID	3-53
Command name	3-53
Format.	3-53
Description.	3-53
Options	3-53
Example.	3-54
Displaying the equipment information.	3-54
Command name	3-54
Format.	3-54
Description.	3-54
Options	3-54
Examples	3-54
RAID/volume commands.	3-56
Referencing a RAID Group.	3-57
Command name	3-57
Format.	3-57

Description	3-57
Options	3-57
Examples	3-57
Setting up a RAID Group	3-59
Command name	3-59
Format	3-59
Description	3-60
Options	3-61
Examples	3-61
Expanding a RAID Group	3-62
Command name	3-62
Format	3-62
Description	3-62
Options	3-63
Examples	3-63
Deleting the RAID Group	3-64
Command name	3-64
Format	3-64
Description	3-64
Options	3-65
Example	3-66
Referencing a volume	3-67
Command name	3-67
Format	3-67
Description	3-67
Options	3-68
Examples	3-68
Setting up a volume	3-70
Command name	3-70
Format	3-70
Description	3-72
Options	3-72
Examples	3-73
Formatting the volume	3-75
Command name	3-75
Format	3-75
Description	3-75
Options	3-76
Examples	3-76
Displaying the progress of volume formatting	3-78
Command name	3-78
Format	3-78
Description	3-78

Options	3-78
Example.	3-78
Referencing/setting the quick format option	3-79
Command name	3-79
Format.	3-79
Description.	3-79
Options	3-79
Examples	3-79
Expanding a volume	3-81
Command name	3-81
Format.	3-81
Description.	3-81
Options	3-81
Examples	3-81
Deleting the volume	3-82
Command name	3-82
Format.	3-82
Description.	3-82
Options	3-82
Examples	3-83
Changing the default controller of a volume	3-84
Command name	3-84
Format.	3-84
Description.	3-84
Options.	3-84
Example.	3-84
Referencing the unified volume	3-85
Command name	3-85
Format.	3-85
Description.	3-85
Options	3-85
Example.	3-85
Unifying volumes	3-86
Command name	3-86
Format.	3-86
Description.	3-86
Options	3-86
Example.	3-86
Separating volumes	3-86
Command name	3-86
Format.	3-87
Description.	3-87
Options	3-87

Example	3-87
Invalidating a volume	3-88
Command name	3-88
Format	3-88
Description	3-88
Options	3-88
Example	3-88
Reassigning a volume	3-89
Command name	3-89
Format	3-89
Description	3-89
Options	3-89
Example	3-89
Restoring a volume	3-90
Command name	3-90
Format	3-90
Description	3-90
Options	3-90
Example	3-90
Referencing/starting/skipping/canceling parity correction online	3-91
Command name	3-91
Format	3-91
Description	3-92
Options	3-92
Examples	3-93
Referencing/setting the mapping guard information	3-94
Command name	3-94
Format	3-94
Description	3-94
Options	3-94
Examples	3-95
Referencing/setting volume cache partition	3-95
Command name	3-95
Format	3-95
Description	3-95
Options	3-96
Example	3-96
Changing the volume size	3-96
Command name	3-96
Format	3-96
Description	3-97
Options	3-97
Example	3-97

System parameters	3-99
Referencing/setting system parameters	3-100
Command name	3-100
Format.	3-100
Description.	3-100
Options	3-100
Example.	3-103
Referencing/setting system parameters online.	3-104
Command name	3-104
Format.	3-104
Description.	3-104
Options	3-105
Referencing/setting system parameters	3-109
Command name	3-109
Format.	3-109
Description.	3-109
Options	3-110
Examples	3-113
Referencing/setting the RTC	3-115
Command name	3-115
Format.	3-115
Description.	3-115
Options	3-115
Examples	3-116
Referencing/setting LAN information.	3-117
Command name	3-117
Format.	3-117
Description.	3-117
Options	3-118
Examples	3-118
Referencing/setting the port option	3-119
Command name	3-119
Format.	3-119
Description.	3-120
Options	3-121
Example.	3-121
Referencing/setting the boot option	3-125
Command name	3-125
Format.	3-125
Description.	3-125
Options	3-126
Example.	3-126
Referencing/setting the time zone	3-127
Command name	3-127

Format	3-127
Description	3-127
Options	3-127
Examples	3-128
Referencing/setting the IP address of the maintenance port	3-129
Command name	3-129
Format	3-129
Description	3-129
Options	3-130
Examples	3-130
Referencing/setting LAN information online	3-133
Command name	3-133
Format	3-133
Description	3-133
Options	3-134
Examples	3-136
Setting up configuration	3-138
Referencing/setting the Fibre Channel information	3-140
Command name	3-140
Format	3-140
Description	3-140
Options	3-141
Examples	3-141
Referencing/setting the spare HDU	3-143
Command name	3-143
Format	3-143
Description	3-143
Options	3-144
Examples	3-144
Referencing/setting the fee-basis option	3-146
Command name	3-146
Format	3-146
Description	3-146
Options	3-147
Examples	3-147
Referencing/setting the drive restoration control information.	3-149
Command name	3-149
Format	3-149
Description	3-149
Options	3-150
Examples	3-151
Referencing/setting the online verify information	3-152
Command name	3-152

Format.	3-152
Description.	3-152
Options	3-153
Examples	3-153
Referencing/setting the command device information.	3-154
Command name	3-154
Format.	3-154
Description.	3-154
Options	3-155
Examples	3-155
Rebooting	3-156
Command name	3-156
Format.	3-156
Description.	3-156
Options	3-156
Examples	3-156
Referencing/setting volume pre-fetch information	3-158
Command name	3-158
Format.	3-158
Description.	3-158
Options	3-158
Examples	3-158
Referencing/splitting the Hi-Copy Pair information	3-159
Command name	3-159
Format.	3-159
Description.	3-159
Options	3-159
Examples	3-159
Referencing/setting the DMLU information	3-161
Command name	3-161
Format.	3-161
Description.	3-161
Options	3-161
Example.	3-161
Referencing/setting the iSCSI port information	3-162
Command name	3-162
Format.	3-162
Description.	3-162
Options	3-163
Examples	3-163
Referencing/setting the iSNS information	3-165
Referencing/setting the CHAP user information	3-166
Command name	3-166

Format	3-166
Description	3-166
Options	3-167
Example	3-169
Referencing/sending a ping	3-170
Command name	3-170
Format	3-170
Description	3-170
Options	3-170
Examples	3-170
Referencing/setting the backend diagnosis information	3-171
Command name	3-171
Format	3-171
Description	3-171
Options	3-171
Examples	3-171
Setting the SNMP environment information and outputting its file	3-172
Command name	3-172
Format	3-172
Description	3-172
Options	3-172
Example	3-172
Referencing/setting e-Mail alert information	3-173
Command name	3-173
Format	3-173
Description	3-173
Options	3-173
Example	3-174
Referencing/setting the LED information	3-176
Command name	3-176
Format	3-176
Description	3-176
Options	3-176
Examples	3-176
Referencing/Starting additional unit information	3-178
Command name	3-178
Format	3-178
Description	3-178
Options	3-178
Examples	3-178
Referencing/setting LAN port information	3-178
Command name	3-178
Format	3-179

Description.	3-179
Options	3-179
Examples	3-180
Setting the SSL option.	3-182
Command name	3-182
Format.	3-182
Description.	3-182
Options	3-182
Example.	3-182
Referencing/setting the UPS information	3-182
Referencing/setting the host response	3-183
Referencing/setting the SSD Endurance information.	3-184
Adding/Removing the I/F Module/Interface Board	3-185
File output of configuration and configuration setting by file	3-188
File output of system parameters	3-189
Command name	3-189
Format.	3-189
Options	3-189
Description.	3-189
Example.	3-189
Common controller parameters	3-191
Controller parameters	3-194
File output configuration of RAID/volume and status	3-195
Command name	3-195
Format.	3-195
Description.	3-195
Options	3-195
Example.	3-195
Formatting LU configuration information	3-198
Format for drive information	3-199
Format for cache information.	3-200
Format for fan information.	3-201
Format for battery information.	3-201
Format for AC power information	3-202
Format for battery backup status information	3-202
Format for loop information	3-203
Format for enclosure information	3-203
Changing the Advanced Security Mode	3-204
Command name	3-204
Format.	3-204
Description.	3-204
Example.	3-204
Setting the system parameters with a file	3-205
Command name	3-205

Format	3-205
Description	3-205
Example	3-206
Setting the RAID/volume definition with a file	3-207
Command name	3-207
Format	3-207
Description	3-207
Options	3-208
Example	3-208
Import/export the system constituent information	3-209
Command name	3-209
Format	3-209
Description	3-210
Options	3-211
Examples	3-213
Outputting the RAID Group/DP Pool/volume information onto a file	3-214
Command name	3-214
Format	3-214
Description	3-214
Examples	3-215
Host groups information	3-218
Referencing/setting host information.	3-219
Command name	3-219
Format	3-219
Description	3-220
Options	3-220
Example	3-226
Referencing/setting host group options	3-227
Command name	3-227
Format	3-227
Description	3-229
Options	3-230
Example	3-244
Referencing/setting mapping information	3-246
Command name	3-246
Format	3-246
Description	3-247
Options	3-247
Example	3-249
Referencing/registration/changing/deleting a host group.	3-249
Command name	3-249
Format	3-249
Description	3-249

Options	3-250
Example.	3-252
File output of host group information	3-252
Command name	3-252
Format.	3-252
Description.	3-252
Options	3-252
Example.	3-252
Setting the host group information with a file	3-254
Command name	3-254
Format.	3-254
Description.	3-255
Options	3-255
Example.	3-255
Target information	3-256
Referencing/setting iSCSI target information	3-257
Command name	3-257
Format.	3-257
Description.	3-257
Options	3-257
Example.	3-260
Referencing/setting the initiator information	3-261
Command name	3-261
Format.	3-261
Description.	3-261
Options	3-262
Example.	3-263
Referencing/setting iSCSI target options	3-264
Command name	3-264
Format.	3-264
Description.	3-266
Options	3-266
Example.	3-278
Referencing/setting iSCSI target mapping information	3-280
Command name	3-280
Format.	3-280
Description.	3-280
Options	3-280
Example.	3-283
NNC parameters.	3-283
Referencing/setting NNC LAN information	3-284
Command name	3-284
Format.	3-284
Description.	3-284

Options	3-284
Example	3-284
Displaying/setting NAS system volume	3-286
Command name	3-286
Format	3-286
Description	3-286
Options	3-286
Examples	3-288
Referencing/setting NAS user volume	3-290
Command name	3-290
Format	3-290
Description	3-290
Options	3-290
Examples	3-291
Referencing/shutdown/booting/rebooting NNC.	3-293
Command name	3-293
Format	3-293
Description	3-293
Options	3-293
Examples	3-294
Monitoring errors	3-296
Setting the starting of the application	3-297
Command name	3-297
Format	3-297
Description	3-297
Options	3-297
Examples	3-297
Monitoring errors	3-298
Command name	3-298
Format	3-298
Description	3-298
Options	3-298
Example	3-299
Referencing/setting the monitoring error options	3-306
Command name	3-306
Format	3-306
Options	3-306
Examples	3-307
Tuning parameters	3-308
Referencing/setting system tuning parameters.	3-309
Command name	3-309
Format	3-309
Description	3-310
Options	3-310

Examples	3-311
Referencing/setting volume tuning parameters	3-313
Command name	3-313
Format.	3-313
Description.	3-313
Options	3-313
Example.	3-313
Referencing/setting prefetch tuning parameters	3-314
Command name	3-314
Format.	3-314
Description.	3-314
Options	3-314
Example.	3-315
Referencing/setting multi-stream tuning parameters	3-316
Command name	3-316
Format.	3-316
Description.	3-316
Options	3-316
Example.	3-317
Referencing/setting volume ownership tuning parameters	3-318
Command name	3-318
Format.	3-318
Description.	3-318
Options	3-318
Examples	3-318
Setting/deleting the account information for scripts	3-319
Command name	3-319
Format.	3-319
Description.	3-319
Options	3-319
Examples	3-320
Miscellaneous commands	3-321
Setting a password in administration mode	3-322
Command name	3-322
Format.	3-322
Description.	3-322
Examples	3-322
Displaying statistical information	3-323
Command name	3-323
Format.	3-323
Description.	3-323
Options	3-323
Example.	3-324

Outputting performance information file	3-324
Command name	3-324
Format	3-324
Description	3-326
Options	3-332
Example	3-336
Referencing/setting the collection state of performance statistics	3-348
Command name	3-348
Format	3-348
Description	3-348
Options	3-348
Examples	3-349
Downloading/updating firmware	3-351
Command name	3-351
Format	3-351
Description	3-351
Options	3-352
Examples	3-353
Examples of using commands	3-355
CLI Commands for Local Replication	3-356
Display pair and pool information	3-356
Command name	3-356
Description	3-356
Syntax	3-357
Options	3-357
Display volumes available for use in pairs	3-359
Display or define the SnapShot volume (V-VOL)	3-360
Display or set up the data pool	3-362
Create pairs	3-363
Split pairs	3-366
Resynchronize pairs	3-368
Restore pairs	3-370
Delete pairs	3-371
Edit pairs	3-372
Monitor pair status—event wait	3-374
CLI, CCI commands for local-replication	3-380
CLI Commands for Remote Replication	3-381
Display pair and pool information	3-381
Display volumes available for use in pairs	3-384
Remote path—display, define, delete, repair	3-385
Display remote path information	3-385
Define the remote path	3-388
Delete remote path target (CHAP secret)	3-391
Reconstruct the remote path	3-392
Delete the remote path	3-393

Display or define TrueCopy options	3-395
Display TrueCopy options	3-395
Creating pairs.	3-397
Split pairs	3-400
Resynchronize pairs	3-402
Swap pairs	3-404
Delete pairs	3-405
Edit pairs	3-408
Monitor pair status—synchronous wait	3-409
Referencing/setting TrueCopy option	3-412
Referencing the TrueCopy option.	3-412
Setting the TrueCopy option	3-413
CLI, CCI commands for remote-replication	3-414
.	3-415

4 HDP CLI operations4-1

Installing Dynamic Provisioning	4-2
Installing Dynamic Provisioning without rebooting	4-2
Installing Dynamic Provisioning/Dynamic Tiering when Cache Partition Manager is Used	4-4
Installing Dynamic Provisioning and rebooting the array.	4-5
Uninstalling Dynamic Provisioning	4-7
Uninstalling without rebooting	4-8
Uninstalling and rebooting the array	4-8
Enabling or disabling Dynamic Provisioning	4-9
Managing DP pools from the command line.	4-11
Creating a new DP pool.	4-11
Changing DP pool thresholds	4-12
Deleting a DP pool	4-15
Reinitializing a DP pool	4-15
Adding DP pool capacity	4-16
Shrinking the DP Pool capacity.	4-17
Canceling the DP Pool Capacity Shrinking	4-17
Managing DP-VOLs from the command line.	4-18
Creating a DP-VOL	4-18
Deleting a DP-VOL from a DP pool	4-19
Changing DP-VOL capacity	4-19
Managing DP pool information.	4-20
Viewing DP pool trend information	4-21
Saving DP pool trend information to a file	4-21
Optimizing DP	4-22
Optimizing the DP pool	4-22
Canceling DP optimization	4-23
Checking the progress of DP optimization	4-23
Changing optimization priority	4-24

Changing the DP Capacity Mode	4-24
Canceling Memory Reconfiguration for DP Capacity Mode Change	4-29
Changing provisioning attributes.	4-30

5 HDT.5-1

Overview	5-2
Installing and Uninstalling	5-2
Installing	5-2
Without Rebooting Installing	5-3
Rebooting Installing	5-5
Items to be checked in advance	5-5
Uninstalling	5-7
Uninstall Dynamic Tiering Without Rebooting Uninstallation.	5-7
Rebooting Uninstalling	5-8
Enabling or Disabling.	5-8
Enabling or Disabling Dynamic Tiering Without Rebooting Enabling or Disabling5-10	
Rebooting Enabling or Disabling	5-10
Managing DP Pools	5-11
Creating DP Pools (with Tier Mode Enabled) Newly.	5-11
Changing the Tier Mode of the DP Pool	5-13
Changing the DP Pool Basic Attribute	5-13
Changing the DP Pool Tier Attribute	5-14
Deleting the DP Pool	5-16
Reinitializing the DP Pool	5-16
Adding a DP Pool Capacity	5-17
Shrinking the DP Pool capacity	5-18
Canceling the DP Pool capacity shrink	5-18
Managing DP-VOLs	5-19
Creating DP-VOLs Newly	5-19
Deleting the DP-VOLs	5-20
Changing the DP-VOL Capacity.	5-20
Managing DP Pool Information.	5-21
Viewing the Trend Information.	5-21
Outputting the Trend Information to a File	5-22
DP Optimization	5-22
Optimizing the DP Pool	5-23
Cancellation of the DP Optimization	5-23
Checking the progress of DP optimization	5-24
Changing optimization priority	5-24
Changing the DP Capacity Mode.	5-25
Canceling Memory Reconfiguration for DP Capacity Mode Change	5-29
Changing the Optimization Priority	5-29
Changing the Provisioning Attributes.	5-30
DP Tier Management.	5-31

Changing the Mode	5-31
Changing the Relocation Periods	5-31
Changing the Monitoring Periods	5-32
Changing the Relocation Speed	5-33
Changing the Tiering Attributes of the DP-VOLs	5-34
Outputting Data	5-34
Outputting the Tier Relocation Cycle Log	5-35
Outputting the Page Relocation Log	5-35
Outputting the Frequency Distribution of the DP Pool to a File	5-35
Outputting the Frequency Distribution of the DP-VOL to a File	5-36
Examples of output for selected commands	5-37
Example of auiscsi output	5-37
Example of audrive output	5-37

A CLI-based storage feature tasksA-1

Storage management features overview	A-2
Storage features support	A-2
Installing the storage features	A-2
Account Authentication	A-3
Installing Account Authentication	A-3
Uninstalling Account Authentication	A-4
Enabling/disabling	A-4
Displaying the account information	A-5
Adding account information	A-6
Modifying the account information	A-7
Deleting the account information	A-9
Changing password of the owner account information	A-9
Changing the log in valid term	A-9
Setting the warning banner	A-10
Changing the Advanced Security Mode	A-10
Setting an external authentication server	A-11
Changing the external authentication server	A-11
Deleting the external authentication server	A-12
Forcibly logging out	A-12
Logging in	A-13
Changing Advanced Security Mode	A-13
Setting/deleting the account information corresponding to the Script	A-14
For Windows	A-14
For Windows	A-14
For Red Hat Linux and UNIX (C shell)	A-14
For Windows:	A-15
For Red Hat Linux and UNIX (C shell):	A-15
Confirming account information for other arrays	A-15
Audit Logging	A-17

Installing	A-17
Uninstalling	A-18
Enabling/disabling	A-18
Setting the Syslog server information	A-19
Exporting the internal logged data	A-19
Initializing the internal logged data	A-20
Audit Log format and output code information	A-20
Audit Log entry information	A-24
Audit log setting example.	A-63
Cache Partition Manager	A-63
Installing	A-64
Uninstalling	A-65
Enabling or disabling	A-65
The capacity of the master partition must be the default partition size. . .	A-65
Adding a cache partition	A-66
Deleting a cache partition	A-67
Assigning a cache partition.	A-68
Setting a pair cache partition	A-70
Changing the cache partition owner controller	A-70
Cache Residency Manager	A-71
Installing	A-71
Uninstalling	A-72
Enabling or disabling	A-72
Operations of cache residency manager	A-73
Data Retention Utility	A-74
Installing	A-74
Uninstalling	A-75
Enabling or disabling	A-75
Setting an attribute	A-76
Setting an S-VOL.	A-77
.	A-77
Setting S-VOL Disable	A-77
Changing the retention term	A-78
Setting the expiration lock	A-79
LUN Manager (Fibre Channel)	A-80
Installing	A-80
Uninstalling	A-81
Enabling or disabling	A-81
Adding a host group	A-82
Setting the host group security.	A-82
Creating a host group	A-82
Setting a host group option	A-83
Setting logical units (LU mapping)	A-83
Adding WWNs.	A-84
Adding a WWN	A-84
Selecting and adding an assignable WWN	A-85

Changing a host group name	A-85
Deleting a host group	A-86
Initializing the host group 0	A-86
Changing a WWN nickname	A-86
Deleting a WWN	A-87
Deleting a detected WWN	A-88
LUN Manager (iSCSI)	A-89
Creating targets	A-89
Setting the target security	A-90
Adding a target	A-90
Setting logical units	A-91
Adding an initiator	A-92
Changing target information	A-92
Deleting a target	A-93
Initializing target 000	A-93
Changing initiator information	A-93
Deleting an initiator	A-94
Adding a CHAP user	A-94
Changing CHAP user information	A-95
Deleting CHAP user	A-95
Modular Volume Migration	A-96
Installing	A-96
Uninstalling	A-96
Enabling or disabling	A-97
Setting the DMLU	A-98
Setting a reserved LU	A-99
Deleting the reserved LU	A-100
Executing Volume Migration	A-100
Changing the copy pace	A-101
Confirming Volume Migration pairs	A-101
Splitting Volume Migration Pairs	A-101
Canceling Volume Migration pairs	A-102
Limitations of Dirty Data Flush Number	A-102
SNMP Agent Support Function	A-103
Installing	A-103
Uninstalling	A-103
Enabling or disabling	A-104
Registering or referencing SNMP environment information	A-104
Fibre Channel Option	A-105
Installing	A-105
Uninstalling	A-106
Enabling or Disabling	A-106
Confirming after Installation	A-107
Power Saving	A-108
Installing	A-108
Uninstalling	A-108

Enabling or Disabling	A-109
Displaying Power Saving information	A-109
Specifying Spin Down	A-110
Specifying Spin Up	A-110
Power Saving Plus	A-112
Installing	A-112
Uninstalling	A-112
Disabling or Enabling	A-113
Displaying Power Saving Information	A-114
Requesting Non I/O-linked Spin Down	A-115
Requesting I/O-linked Spin Down	A-116
Requesting I/O-linked Drive Power OFF	A-117
Requesting I/O-linked Spin Down with Drive Power OFF	A-117
Requesting Remove Power Saving (Spin Up)	A-118

Glossary

Index



Preface

Welcome to the Hitachi Unified Storage Command Line Interface Reference Guide.

This document describes how to use the Hitachi Unified Storage command line interface software.

Please read this document carefully to understand how to use this product, and maintain a copy for reference purposes.

This preface includes the following information:

- ☐ [Intended audience](#)
- ☐ [Product version](#)
- ☐ [Changes in this revision](#)
- ☐ [Changes in this revision](#)
- ☐ [Document Organization](#)
- ☐ [Related documents](#)
- ☐ [Document conventions](#)
- ☐ [Convention for storage capacity values](#)
- ☐ [Accessing product documentation](#)
- ☐ [Getting help](#)
- ☐ [Comments](#)

Intended audience

This document is intended for system administrators, Hitachi Data Systems representatives, and authorized service providers who install, configure, and operate Hitachi Unified Storage systems.

This document assumes the following:

- The user has a background in data processing and understands storage systems and their basic functions.
- The user has a background in data processing and understands Microsoft Windows and their basic functions.
- The user has a background in data processing and understands Web browsers and their basic functions.

Product version

This document applies to Hitachi Unified Storage firmware version 0981/D and to HSNM2 version 28.12 or later.

Changes in this revision

- Under [Figure \(page 2-2\)](#), added information about running Hitachi Storage Navigator Modular 2 in an environment where the process monitoring and the virus monitoring service (daemon process) are running.
- Under [Creating pairs \(page 3-393\)](#), revised description for **-pairname** **pair_name**.

Document Organization

Thumbnail descriptions of the chapters are provided in the following table. Click the [chapter title](#) in the first column to go to that chapter. The first page of every chapter or appendix contains links to the contents.

Chapter/Appendix Title	Description
Chapter 1, Introduction	Describes the general features, functions, and benefits of using Hitachi CLI.
Chapter 2, Navigator 2 installation	Describes the process of installing Navigator 2 so the CLI is active.
Chapter 3, CLI command list	Describes each command in the full Navigator 2 command set.
Chapter 4, HDP CLI operations	Describes CLI tasks of the Hitachi Dynamic Provisioning feature.
Chapter 5, HDT CLI Operations	Describes CLI tasks of the Hitachi Dynamic Tiering feature.
Appendix A, CLI-based storage feature tasks	Describes CLI-based storage feature tasks.



HSNM2 also provides a graphical user interface that lets you perform operations by typing commands from a command line. For information about using the Dynamic Provisioning command line, refer to the *Hitachi Unified Storage Operations Guide*.

Related documents

This documentation set consists of the following documents.

Hitachi Unified Storage Firmware Release Notes, RN-91DF8304

Contains late-breaking information about the storage system firmware.

Hitachi Storage Navigator Modular 2 Release Notes, RN-91DF8305

Contains late-breaking information about the Navigator 2 software.

Read the release notes before installing and using this product. They may contain requirements and restrictions not fully described in this document, along with updates and corrections to this document.

Hitachi Unified Storage Getting Started Guide, MK-91DF8303

Describes how to get Hitachi Unified Storage systems up and running in the shortest period of time. For detailed installation and configuration information, refer to the Hitachi Unified Storage Hardware Installation and Configuration Guide.

Hitachi Unified Storage Hardware Installation and Configuration Guide, MK-91DF8273

Contains initial site planning and pre-installation information, along with step-by-step procedures for installing and configuring Hitachi Unified Storage systems.

Hitachi Unified Storage Hardware Service Guide, MK-91DF8302

Provides removal and replacement procedures for the components in Hitachi Unified Storage systems.

Hitachi Unified Storage Operations Guide, MK-91DF8275

Describes the following topics:

- Adopting virtualization with Hitachi Unified Storage systems
- Enforcing security with Account Authentication and Audit Logging.
- Creating DP-VOLs, standard VOLs, Host Groups, provisioning storage, and utilizing spares
- Tuning storage systems by monitoring performance and using cache partitioning
- Monitoring storage systems using email notifications and Hi-Track
- Using SNMP Agent and advanced functions such as data retention and power savings
- Using functions such as data migration, VOL Expansion and VOL Shrink, RAID Group expansion, DP pool expansion, and Mega VOLs

Hitachi Unified Storage Replication User Guide, MK-91DF8274

Describes how to use the four types of Hitachi replication software to meet your needs for data recovery:

- ShadowImage In-system Replication
- Copy-on-Write SnapShot
- TrueCopy Remote Replication
- TrueCopy Extended Distance

Hitachi Unified Storage Command Control Interface Installation and Configuration Guide, MK-91DF8306

Describes Command Control Interface installation, operation, and troubleshooting.

Hitachi Unified Storage Dynamic Provisioning Configuration Guide, MK-91DF8277

Describes how to use virtual storage capabilities to simplify storage additions and administration.

Hitachi Unified Storage Command Line Interface Reference Guide, MK-91DF8276

Describes how to perform management and replication activities from a command line.— **this document**

Document conventions

The following typographic conventions are used in this document.

Convention	Description
Bold	Indicates text on a window, other than the window title, including menus, menu options, buttons, fields, and labels. Example: Click OK .
<i>Italic</i>	Indicates a variable, which is a placeholder for actual text provided by you or the system. Example: copy <i>source-file target-file</i> Angled brackets (< >) are also used to indicate variables.
screen or code	Indicates text that is displayed on screen or entered by you. Example: <code># pairedisplay -g oradb</code>
< > angled brackets	Indicates a variable, which is a placeholder for actual text provided by you or the system. Example: <code># pairedisplay -g <group></code> Italic font is also used to indicate variables.
[] square brackets	Indicates optional values. Example: [a b] indicates that you can choose a, b, or nothing.
{ } braces	Indicates required or expected values. Example: { a b } indicates that you must choose either a or b.
vertical bar	Indicates that you have a choice between two or more options or arguments. Examples: [a b] indicates that you can choose a, b, or nothing. { a b } indicates that you must choose either a or b.
underline	Indicates the default value. Example: [<u>a</u> b]

This document uses the following symbols to draw attention to important safety and operational information.

Symbol	Meaning	Description
	Tip	Tips provide helpful information, guidelines, or suggestions for performing tasks more effectively.
	Note	Notes emphasize or supplement important points of the main text.
	Warning	Warns that failure to take or avoid a specified action could result in severe conditions or consequences (for example, loss of data).
	Caution	Cautions indicate that failure to take a specified action could result in damage to the software or hardware.

The following abbreviations for Hitachi Program Products are used in this document.

Abbreviation	Description
ShadowImage	ShadowImage In-system Replication
SnapShot	Copy-on-Write SnapShot
TrueCopy	A term used when the following terms do not need to be distinguished: • True Copy • True Copy Extended Distance • True Copy remote replication
TCE	TrueCopy Extended Distance
Volume Migration	Modular Volume Migration
Navigator 2	Hitachi Storage Navigator Modular 2
HSNM2	Hitachi Storage Navigator Modular 2

Convention for storage capacity values

Physical storage capacity values (for example, disk drive capacity) are calculated based on the following values:

Physical capacity unit	Value
1 KB	1,000 bytes
1 MB	1,000 KB or 1,000 ² bytes
1 GB	1,000 MB or 1,000 ³ bytes
1 TB	1,000 GB or 1,000 ⁴ bytes
1 PB	1,000 TB or 1,000 ⁵ bytes

Physical capacity unit	Value
1 EB	1,000 PB or 1,000 ⁶ bytes

Logical storage capacity values (for example, logical device capacity) are calculated based on the following values:

Logical capacity unit	Value
1 block	512 bytes
1 KB	1,024 (2 ¹⁰) bytes
1 MB	1,024 KB or 1024 ² bytes
1 GB	1,024 MB or 1024 ³ bytes
1 TB	1,024 GB or 1024 ⁴ bytes
1 PB	1,024 TB or 1024 ⁵ bytes
1 EB	1,024 PB or 1024 ⁶ bytes

Accessing product documentation

The Hitachi Unified Storage user documentation is available on the HDS Support Portal: <https://portal.hds.com>. Please check this site for the most current documentation, including important updates that may have been made after the release of the product.

Getting help

The Hitachi Data Systems customer support staff is available 24 hours a day, seven days a week. If you need technical support, please log on to the HDS Support Portal for contact information: <https://portal.hds.com>

Comments

Please send your comments on this document: doc.comments@hds.com. Include the document title, number, and revision, and refer to specific sections and paragraphs whenever possible.

Thank you!

Introduction

This chapter provides information on the supported AMS 2000 Family and SMS 100 storage features available from Hitachi Storage Navigator Modular 2 Graphical User Interface (GUI) and covers the following topics:

- ❑ [Overview of Storage Navigator Modular 2](#)
- ❑ [Features](#)
- ❑ [Software applications and HSNM2 features](#)

Overview of Storage Navigator Modular 2

Storage Navigator Modular 2 is a multi-featured scalable storage management application that is used to configure and manage the storage functions on the Hitachi Simple Modular Storage 100 and other Hitachi arrays. Storage Navigator Modular 2 can be accessed by its graphical user interface (GUI) or by the command line interface (CLI) that this manual describes.

Storage Navigator Modular 2 has two operating modes:

- **Management Mode** contains the user-level storage management functions. This mode is intended only for maintenance technicians or qualified users.
- **Administration Mode** is used to manage user accounts and passwords on older AMS 200/500/1000 systems and not the current HUS systems. This operating mode is accessible only to users with administrator permissions.

Features

Table 1-1 describes the Storage Navigator Modular 2 features.

Table 1-1: Storage Navigator Modular 2 features

Function Name	Description
Component status display	Displays the status of a component. For example, a drive or a fan.
Property display	Displays the status of arrays. For example, a RAID or logical unit.
Create RAID Groups	Used to add a RAID group. You can set a new RAID group by specifying its disk number, RAID level, and group range for the RAID group to be created. Note that creating a RAID group on a Simple Modular Storage system invalidates your Hitachi warranty and support.
Delete RAID groups	Deletes a defined RAID group or a specified RAID group. User data is deleted. Deleting a RAID group on a Simple Modular Storage system invalidates your Hitachi warranty and support.
Create Logical Units	Used to add a logical unit. A new logical unit is added by specifying its capacity.
Delete Logical Units	Deletes the defined logical unit. User data is deleted.
Format Logical Units	Required to make a defined logical unit (LU) accessible by the host. Writes null data to the specified logical unit, and deletes user data.
Parity Correction	Restores the logical unit in which a parity error has occurred.
Volume Expansion	Unified volumes.
Setting up a Spare Disk drive	Sets up spare disk drives.

Table 1-1: Storage Navigator Modular 2 features (Continued)

Function Name	Description
Differential Management LU	Sets up the differential management logical unit. This is only used for replication purposes. Note: <i>Modifying the differential management logical unit on the Simple Modular Storage system invalidates your Hitachi warranty and support.</i>
Command Device	Sets up the command devices. This is only used for replication purposes.
Setup and Display Optional Features	Installs/uninstalls the priced optional features key and sets and displays the enable/disable condition.
Setting the Boot Option	Sets up the boot option. The array must be restarted to implement the setting.
Setup and Display of the iSCSI Information	Sets and displays IP addresses and security information, etc.
System Parameters	Sets up the system parameters.
Port option	Configures the options on each port used by the array.
Setting the Drive Restoration Option	Sets automatic or non-automatic start for the following: Drive restoration mode Start of copy-back Start of correction copy Time interval restoring processing unit size Dynamic sparing mode Note: The default modes are set for best system performance. Hitachi recommends using other modes only when necessary.
On-line Verify Setting	Displays the status of the online verification setting (On/Off) and sets the interval. Note that this function can degrade performance when used. <i>Note that modifying the online verification information on the Simple Modular Storage system invalidates your Hitachi warranty and support.</i>
LAN Configuration Information Setting	Sets the IP address, subnet mask, default gateway address, and the DHCP (Dynamic Host Configuration Protocol) mode.
Setup and Display of RTC (real-time clock)	Sets and displays the date and time.
Configuration information file output and its setup by use of a file.	Outputs system parameters and RAID group/logical unit configuration information to a file individually. Sets system parameters and RAID group/logical unit configuration information using a file. The array must be restarted to implement the settings. Deletes user data.
Microcode (firmware) updating	Downloads and updates the array microcode (firmware). You must reboot the array to implement the settings

Table 1-1: Storage Navigator Modular 2 features (Continued)

Function Name	Description
Command Operation Status Display	Outputs the command operation status during a certain period, or a specified period in the text file.
Report when a failure occurs and controller status display	Checks the array and displays the status. If an error is detected, it is logged and sent by e-mail. A specified application is also started.

Software applications and HSNM2 features

The following table lists the software and storage features that are already installed on the Simple Modular Storage system and is ready for use, and software that is installed but must be enabled with a license key. Contact HDS Technical Support to obtain licenses for the optional software. Some features described in this section may not be available with your product. Contact your sales representative if you have questions on the features your system supports.

Table 1-2: Software applications and storage features

Functions	Type	Default State at startup
Installed Software – Licensed and Ready to Use (first release)		
Audit Logging	Bundled	Disabled
Copy-on-write Snapshot (dual controller only)	Bundled	Disabled
LUN Manager	Bundled	Enabled
Performance Monitor	Bundled	Disabled
SNMP Support Agent	Bundled	Disabled
Optional Software – Requires License Key		
ShadowImage (dual controller only)	Optional	Disabled
TrueCopy Extended Distance (SimpleDR) (dual controller only)	Optional	Disabled
Features Not Currently Supported on Simple Modular Storage System		
Cache Partition Manager		
Cache Residency Manager		
Data Retention Utility		
Modular Volume Migration		
Power Saving		
TrueCopy remote replication (Sync.)		



NOTE: Functions listed as “management mode” are intended only for maintenance technicians or qualified users.

The following table lists the available functions for Storage Navigator Modular 2. The functions that are available are determined by whether you are in normal mode or management mode. Normal mode is the default, but you can change it in the startup window before you connect to the array. Except for error monitoring, do not operate Storage Navigator Modular 2 while you are online, or your connection may time out.



NOTE: Some features described in this guide may either require an additional license purchase or may not be available for your system. Contact your sales representative to confirm the storage features that are available with the system version you purchased.

Table 1-3: Storage Navigator Modular 2 Functions

Category	Function Name	Description	Usability During Operations	Normal Mode
Configuration display	Component status display	Displays the status of a component. For example, a drive or fan.	Yes	Yes
	Property display	Displays the status of array system components. For example, RAIDs or logical units.	Yes	Yes
RAID group definition	RAID group creation	Used to add a RAID group. You can set a new RAID group by specifying its disk number, RAID level, and group range for the RAID group to be created.	Yes	No
	RAID group deletion	Deletes a defined RAID or a specified RAID group. User data is also deleted.	No	No

Table 1-3: Storage Navigator Modular 2 Functions (Continued)

Category	Function Name	Description	Usability During Operations	Normal Mode
Volume definition	Volume creation	Used to add a volume. A new volume is added by specifying its capacity.	Yes	No
	Volume deletion	Deletes the defined volume. User data is also deleted.	No	No
	Volume formatting	Required to make a defined volume accessible by the host. Writes null data to the specified volume, and deletes user data.	No /Yes	No
	Parity correction	Restores the volume where the parity error occurred.	Yes	No
Setting the selection	Setting up spare disk drive	Sets up spare disk drives.	Yes	No
	Differential management LU	Sets up the differential management logical unit.	Yes	No
	Command device	Sets up the command devices.	Yes	No
	Setup and display of the priced optional features	Installs/uninstalls the priced optional features key and sets and displays the enable/disable condition.	Yes	No

Table 1-3: Storage Navigator Modular 2 Functions (Continued)

Category	Function Name	Description	Usability During Operations	Normal Mode
Configuration setting	Setting the boot option	Sets up the boot option. The array must be restarted to implement the setting.	No	No
	Setting and display of the fibre channel information	Sets and displays port addresses and security information, etc.	No	No
	System parameter	Sets up system parameters.	Yes	No
	Port Option	Sets up port options.	Yes	No
	Setting the drive restoration option	Use the default mode (unless it is necessary to use another mode) because you could affect performance. Sets automatic or non-automatic start for the following: Drive restoration mode Start of copy-back Start of correction copy Time interval restoring processing unit size Dynamic sparing mode	No	No
	On-line verify setting	Determines whether the online verify setting is on or off, and sets the interval. Use caution, because performance could be affected.	Yes	No
	LAN configuration information setting	Sets the IP address, subnet mask, default gateway address, and the DHCP mode.	Yes	No
	Setup and display of RTC	Sets and displays the date and time.	Yes	No
	Configuration information file output and its setup by use of a file.	Outputs system parameters and RAID group/logical unit configuration information to a file individually. Sets system parameters and RAID group/logical unit configuration information using a file. The array must be restarted to implement the settings. Deletes user data.	Yes	Yes

Table 1-3: Storage Navigator Modular 2 Functions (Continued)

Category	Function Name	Description	Usability During Operations	Normal Mode
Statistical information display	Controller use information display	Displays previous statistical information by selecting a related item.	Yes	Yes
Performance	Command operation status display	Outputs the command operation status during a certain period or a specified period to the file in the text format.	Yes	Yes
Error monitoring	Report when a failure occurs and controller status displays	Polls the array and displays the status. If an error is detected, it is logged and sent by e-mail. A specified application is started.	Yes	Yes

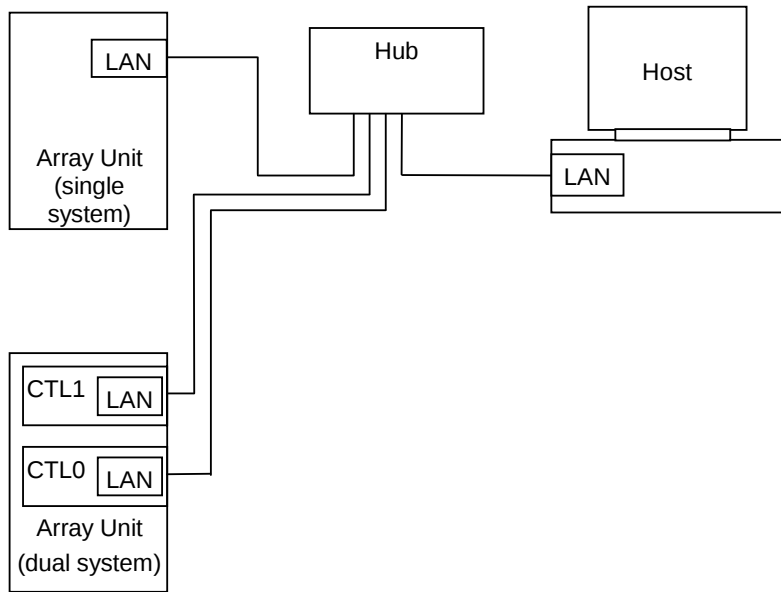
Navigator 2 installation

This chapter provides information for installing Navigator 2 and the supported storage features available from Hitachi Storage Navigator Modular 2 on an HUS 100 series storage system. The chapter covers the following topics:

- ❑ [Connecting Navigator 2 to the host](#)
- ❑ [System requirements](#)
- ❑ [IPv6 supported platforms](#)
- ❑ [Installing Storage Navigator Modular 2](#)
- ❑ [Updating Storage Navigator Modular 2](#)

Connecting Navigator 2 to the host

You can connect Storage Navigator Modular 2 to a host through a LAN with or without a hub.



CLI installation caveats

Review the following installation caveats.

- Some Navigator 2 functions are not available while the array is online with a host.
- When a high I/O load exists, the function available while online might cause a command timeout to the host or a recovering fault in Navigator 2. For best results, execute these functions while offline.
- At least one volume must be configured in the array to make all of the Navigator 2 functions available. If a volume is not defined in the array, some functions cannot execute. Also, note that a volume is the same as a logical unit. However, the command response messages display as a logical unit or LU.
- Navigator 2 can control up to 4,096 array units. Configurations (setting of RAID groups, volumes, etc.) can only be done on one array unit at a time. Error Alert monitoring must be stopped to configure arrays.
- When the host enters the suspension status (low power mode) while Navigator 2 is running, the application might not operate correctly after the host is released from the suspension status.
- Navigator 2 may fail in the following cases:
 - The communication with the connected array fails because of controller blockage, array failure, a disconnected LAN connection, or the array unit receives a Reset/LIP from the host.

- Other applications are working concurrently and memory utilization or the CPU use rate is high.

If Navigator 2 fails, manually terminate it and check the array status and the LAN connection status. Then boot Navigator 2 again. Start Navigator 2 when you finish other applications.

- When Navigator 2 connects to the array via a LAN, it uses the TCP/IP port number 2000. The TCP/IP port number of the array is set to 2000 by default.

[Table 2-1](#) lists restrictions for Navigator 2 if it is used in combination with other programs for one storage system:

Table 2-1: Restrictions for concurrent multiple program use

Program Name	Concurrent Use Supported	Concurrent Use Not Supported
Hitachi Storage Navigator Modular 2	• SNMP Function • Disk Array with Built In Web Server Function	• Navigator 2 • Storage Navigator Modular for Web
Storage Navigator Modular for Web	• SNMP Function • Disk Array Built In Web Server Function	• Navigator 2 • Storage navigator Modular for Web
SNMP Function	Navigator 2 Storage Navigator Modular for Web SNMP Function Disk Array Built In web Server Function	N/A
Disk Array Built in Web Server Function	Navigator 2 Storage Navigator Modular for Web SNMP Function Disk Array Built In Web Server Function	N/A

You can have two concurrent instances of Navigator 2, provided that they are not connected to the same array. If one instance terminates forcibly, that may affect the other instance.

Additionally, if one Navigator 2 instance terminates forcibly while using two Navigator 2 products simultaneously, another Navigator 2 instance may terminate abnormally. If this occurs, operate the instance that has abnormally terminated again.

If you run a combination of programs in which concurrent use is not allowed, when a program with a usage restriction placed on it has started, run another program with that combination after terminating the running program.

To operate other features, refer to the chapters that cover them.

- When connecting the array with Navigator 2 over a LAN, the array may not be able to connect because a time-out of the data transfer occurs. This depends on the LAN environment. When Navigator 2 cannot be connected with the array, verify that the connection is correct using the ping command.

If a response to the ping command is normal, the LAN environment may affect the data transfer. The length of data to be transferred can be changed with the "lanconf.inf" file in the directory in which Navigator 2 is installed. The default setting is "32768." Change the setting to "16384" or "8192", in this order or to a multiple of 1024, and then retry.

The new setting becomes effective from the next operation. A restart of Navigator 2 is not required. Operation of Navigator 2 may take some time, depending on the setting. If the connection cannot be made regardless of the setting change, review the LAN environment.

- If you execute the command during the firmware update or controller recovery, the LAN becomes unusable and the operation may fail. In this case, run it again after completing the update or controller maintenance.
- If an array failure is detected, contact Hitachi Customer Engineering.
- Do not use the reserved words prescribed for each OS and device names that indicate the input/output destinations as a filename when a file outputs. Windows includes "con," "pm," "aux," and others. Unix includes "/dev," and others. For example, when you specify the string "con" as an output name, an error message displays.
- When a command executes through utilization of a network with telnet, etc., a window may be closed by pressing the Enter key, depending on the alive time of the window. Set the alive time to be more than 10 minutes.
- When operating the command that indicates the Account Authentication's function is valid, it terminates abnormally if it does not respond with the confirmation message within the session timeout limit (20 minutes) before executing the command. When the confirmation message displays, check the content and respond to that message. If it terminates abnormally by the session timeout limit, log in again and reissue the command.
- When connecting to Navigator 2 using IPv6 if the temporary address of IPv6 is set to the Enabled state in the installed computer and many temporary addresses are registered, the processing time becomes long. Check the temporary addresses and if many are set, disable them.
- The IPv6 multicast of the link local scope is used for the array search by the IPv6 address. When performing the array search, set up the array and the computer in which Navigator is installed in the same link.
- While executing the command, if you stop it by pressing Ctrl + C and then start immediately, an error may occur. After stopping the command by executing Ctrl + C, execute the command again in a few minutes.
- In the configuration of connecting a DBF to Unit#0, if you execute the following commands by using a Navigator version of less than V25.50, the string "CLI Program Error" displays and the program improperly terminates. Use a Navigator version of V25.50 or greater.
 - **audrive**
 - **auhdrump**
 - **aurgadd**

- **aurgexp**
- **auspare**
- **auconstitute**
- While executing commands that perform setting or referencing operations, storage system performance for the host I/O may decrease. Also, if you execute multiple operations at the same time, performance may decrease more. Hitachi recommends executing five or less operations simultaneously. When using the 9500V, execute two or less.
- The setting/reference operations that one storage system can simultaneously receive from Navigator 2 can be up to specific thresholds. The following table details these values.

Revisions of the Array Unit and the Firmware		Maximum Simultaneous Operations
HUS 100	0980/A or later	50
	Less than 0980/A	5
AMS 2000	08C5/A or later	50
	Less than 08C5/A	5
SMS	All revisions	5
AMS/WMS	All revisions	5
9500V	All revisions	2

If you try to execute the maximum number of operations that can be received at once for one storage system, the following errors may occur:

Message Code	Error Code	Message Text
DMEA000006	0x00060000	Failed to connect with the subsystem. Confirm the subsystem status and the LAN environment, and then try again.
DMEA000007	0x00070000	An invalid response was received from the subsystem. Confirm the subsystem status and the LAN environment, and then try again.
DMEA000008	0x0001002	Failed to transfer data. Confirm the subsystem status and the LAN environment, and then try again.

In an environment where the process monitoring and the virus monitoring service (daemon process) are running, Hitachi Storage Navigator Modular 2 processing might delay and the following phenomena might occur.

- Hitachi Storage Navigator Modular 2 display takes time.
- Performance data cannot be acquired (output data is displayed as “skipped”).

These conditions might be resolved by canceling process monitoring and virus monitoring service, or by excluding the Hitachi Storage Navigator Modular 2 installation directory from the monitoring target.

System requirements

This section describes system requirements for your CLI environment.

Windows server

CPU: Pentium®

Memory: 256 MB minimum

Disk capacity: 2.0 GB minimum

Network adapter

Virtual memory: 128 MB

The following table shows the supported Windows.

Operating System	Service Pack
Windows XP (x86)	SP2, SP3
Windows Server 2003 (x86)	SP1, SP2
Windows Server 2003 R2 (x86)	Non SP, SP2
Windows Server 2003 R2 (x65)	Non SP, SP2
Windows Vista (x86)	SP1
Windows Server 2008 (x86)	Non SP, SP2
Windows Server 2008 (x64)	Non SP, SP2
Windows 7 (x86)	Non SP, SP1
Windows 7 (x64)	Non SP, SP1
Windows Server 2008 R2 (x64)	Non SP, SP1
Windows Server 2012 (x64)	Non SP
Windows 8 (x86)	Without SP
Windows 8 (x64)	Without SP

The following table shows the supported host operating system. The guest operating system supported by the host operating system is the operating system supported by the host operating system and the server.

Host Operating System	Guest Operating System
VMware ESX 3.0.x	Windows XP
	Windows Server 2003 R2
VMware ESXi 4.1	Windows Server 2008 SP2 (x64)
	Windows Server 2008 R2 (x64)
VMware EXSi 5.0	Windows Server 2008 R2 (SP1)(x64)
Windows Server 2008 R2 (x64) (Hyper-V2)	Windows Server 2008 R2 (x64)
Windows Server 2012 (x64) (Hyper-V3)	Windows Server 2012 (x64)
Windows Server 2012 (x64)(Hyper-V3.1)	
VMware 5.1 update1	Windows Server 2008 R2 (SP1)
	Windows Server 2012

Host Operating System	Guest Operating System
VMware 5.5	Windows Server 2012
VMware 5.5 update 1	Windows Server 2012
VMware 5.5 update 2	Windows Server 2012

Solaris™ (SPARC)

Solaris 8, 9, 10
CPU: UltraSPARC or higher
Memory: 256 MB minimum
Virtual Memory: 128 MB or higher
Disk capacity: 110 MB maximum
Network adapter

Solaris™ (x86, 32 Bits OS)

Solaris 10
CPU Pentium
Memory: 256 MB minimum
Virtual Memory: 128 MB or higher
Disk capacity: product version 100 MB maximum
Network adapter

HP-UX

HP-UX 11.0, 11i, 11i v2.0, 11i v3.0
CPU: PA8000 or higher (HP-UX 11i v2.0 operates in Itanium® 2 environment)
Memory: 256 MB minimum
Disk capacity: 110 MB minimum
Network adapter

AIX

AIX 5.1, 5.2, 6.1, or 7.1
CPU: PowerPC/RS64 II or higher
Memory: 256 MB minimum
Disk capacity: 128 MB minimum
Network adapter
Premise program: IBM XL C/C++ Enterprise Edition V8.0 for AIX, Runtime Environment and Utilities. Moreover, the libc version must be the following or more.
AIX 5.1: bos.rte.libc 5.1.0.62 (APARIY58419)
AIX 5.2: box.rte.libc 5.2.0.41 (APARIY58421)

AIX 5.3: box.rte.libc 5.3.0.3 (APARIY59143)

Linux

- Red Hat Enterprise Linux 4 Update 1
- Red Hat Enterprise Linux 4 Update 5
- Red Hat Enterprise Linux 5.5 (excluding SELinux)
- Red Hat Enterprise Linux 5.5 (excluding SELinux)
- Red Hat Enterprise Linux 5.6, (x86, x64, excluding SELinux)
- Red Hat Enterprise Linux 6.1 (x86) (excluding SELinux)
- Red Hat Enterprise Linux 6.1 (x64) (excluding SELinux). Premise patch: glibc-2.12-1.25.el6.i686.rpm or its inheritor nss-softokn-freebl-3.12.9-3.el6.i686.rpm or its inheritor



NOTE: Premise patch: glibc-2.12-1.25.el6.i686.rpm or its inheritor, nss-softokn-freebl-3.12.9-3.el6.i686.rpm or its inheritor.

- Red Hat Enterprise Linux 6.2 (x86) (excluding SELinux)
- Red Hat Enterprise Linux 6.2 (x64) (excluding SELinux). Premise patch: glibc-2.12-1.47.el6.i686.rpm or its inheritor nss-softokn-freebl-3.12.9-11.el6.i686.rpm or its inheritor. Not supported update from Red Hat Enterprise Linux AS 4.0 to update. Supported only x86 environment.



NOTE: Premise patch: glibc-2.12-1.47.el6.i686.rpm or its inheritor, nss-softokn-freebl-3.12.9-11.el6.i686.rpm or its inheritor.

- Red Hat Enterprise Linux 6.3 (x86) (excluding SELinux)
- Red Hat Enterprise Linux 6.3 (x64) (excluding SELinux)



NOTE: Premise patch: glibc-2.12-1.80.el6.i686.rpm or its inheritor, nss-softokn-freebl-3.12.9-11.el6.i686.rpm or its inheritor.

- Red Hat Enterprise Linux 6.4 (x86) (excluding SELinux)
- Red Hat Enterprise Linux 6.4 (x64) (excluding SELinux)



NOTE: Premise patch: glibc-2.12-1.107.el6.i686.rpm or its inheritor, nss-softokn-freebl-3.12.9-11.el6.i686.rpm or its inheritor.

- Red Hat Enterprise Linux 7.0 (x64) (excluding SELinux)



NOTE: Premise patch: glibc-2.17-55.el7.i686.rpm or its inheritor, nss-softokn-freebl-3.15.4-2.el7.i686.rpm or its inheritor.

- CPU: Pentium-II, III, IV (233 MHz or more is recommended)
- Memory: 256 MB
- Virtual memory: 128 MB
- Disk capacity: 120 MB
- Network adapter

Supported Linux versions for Virtual OS

The following table shows the supported Linux version for each version of a virtual operating system.

Host Operating System	Guest Operating System
VMware ESXi 5.0 u1	Red Hat Enterprise Linux 5.5 (x64)
	Red Hat Enterprise Linux 5.5 (x86)
	Red Hat Enterprise Linux 5.8 (x64)
	Red Hat Enterprise Linux 5.8 (x86)
	Red Hat Enterprise Linux 6.2 (x64)
	Red Hat Enterprise Linux 6.2 (x86)
VMware ESXi 5.0 u2	Red Hat Enterprise Linux 5.5 (x64)
	Red Hat Enterprise Linux 5.5 (x86)
	Red Hat Enterprise Linux 5.8 (x64)
	Red Hat Enterprise Linux 5.8 (x86)
	Red Hat Enterprise Linux 6.2 (x64)
	Red Hat Enterprise Linux 6.2 (x86)
VMware ESXi 5.1 u1	Red Hat Enterprise Linux 6.4 (x64)

Operating environments of the guest operating system are the same as normal operating environments.

LAN Connection

Connect one of the LAN cables to the LAN port of the controller #0 or controller #1 of the array.

Connect the other of the LAN cables to the LAN-HUB prepared by a customer or the LAN port of the host for controlling the array.

The LAN port supports the function (Auto MDI/MDX) to automatically distinguish the LAN cable type (straight or cross). Therefore, you can connect it with the straight cable when connecting to the LAN-HUB and directly connecting to the host for controlling the array.

Port Number of TCP/IP

When connecting the array and a LAN, Navigator 2 uses the normal port number of 2000 and uses the secure port number of 28355.

IPv6 supported platforms

Table 2-2 shows the IPv6 supported platforms.

Table 2-2: IPv6 Supported Platforms

Vendor	Operating System		IPv6 Supported
	Name	Service Pack	
SUN	Solaris 8 (SPARC)	–	Supported
	Solaris 9 (SPARC)	–	Supported
	Solaris 10 (SPARC)	–	Supported
	Solaris 10 (x86)	–	Supported
	Solaris 10 (x64)	–	Supported
Microsoft	Windows Server 2003 (x86)	SP1	Supported
	Windows Server 2003 (x86)	SP2	Supported
	Windows Server 2003 R2 (x86)	Without SP, With SP2	Supported
	Windows Server 2003 R2 (x64)	Without SP	Supported
	Windows Vista (x86)	SP1	Supported
	Windows Server 2008 (x86)	SP1, SP2	Supported
	Windows Server 2008 (x64)	SP1, SP2	Supported
	Windows Server 2008 R2 (x64)	SP, With SP1	Supported
	Windows Server 2012 (x64)	Without SP	Supported
	Windows 7 (x86)	Without SP, With SP1	Supported
	Windows 7 (x64)	Without SP, With SP1	Supported
Red Hat	Red Hat Enterprise Linux 4.0 Update1	–	Address searching function is not supported on the server.
	Red Hat Enterprise Linux 4.0 Update5	–	Address searching function is not supported on the server.
	Red Hat Enterprise Linux 5.3	-	Address searching function is not supported on the server.
	Red Hat Enterprise Linux 5.4	-	Address searching function is not supported on the server.
	Red Hat Enterprise Linux 5.5	-	Address searching function is not supported on the server.

Table 2-2: IPv6 Supported Platforms

Red Hat Enterprise Linux 5.6	-	Address searching function is not supported on the server.
Red Hat Enterprise Linux 5.7 (x86)	-	Address searching function is not supported on the server.
Red Hat Enterprise Linux 5.7 (x64)	-	Address searching function is not supported on the server.
Red Hat Enterprise Linux 5.8 (x86)	-	Address searching function is not supported on the server.
Red Hat Enterprise Linux 5.8 (x64)	-	Address searching function is not supported on the server.
Red Hat Enterprise Linux 6.1 (x86)	-	Address searching function is not supported on the server.
Red Hat Enterprise Linux 6.1 (x64)	-	Address searching function is not supported on the server.
Red Hat Enterprise Linux 6.2 (x86)	-	Address searching function is not supported on the server.
Red Hat Enterprise Linux 6.2 (x64)	-	Address searching function is not supported on the server.
Red Hat Enterprise Linux 6.3 (x86)	-	Address searching function is not supported on the server.
Red Hat Enterprise Linux 6.3 (x64)	-	Address searching function is not supported on the server.
Red Hat Enterprise Linux 6.4 (x86)	-	Address searching function is not supported on the server.
Red Hat Enterprise Linux 6.4 (x64)	-	Address searching function is not supported on the server.

Table 2-2: IPv6 Supported Platforms

Red Hat Enterprise Linux 6.5 (x86)	-	Address searching function is not supported on the server.
Red Hat Enterprise Linux 6.5 (x64)	-	Address searching function is not supported on the server.
Red Hat Enterprise Linux 7.0 (x64)	-	Address searching function is not supported on the server.

Installing Storage Navigator Modular 2

This section provides instructions for installing Storage Navigator Modular 2 in Windows, Solaris, Red Hat Linux, HP-UX, AIX, IRIX and how to change the registration information on the array. After Storage Navigator Modular 2 registers the array, the registration information cannot be overridden.

To update Storage Navigator Modular 2, you must remove it and install a new version. When you install a new version of Storage Navigator Modular 2, you must specify the error monitoring options again.

When registering an array into Storage Navigator Modular 2, use the `auunitadd` command to specify the unit name. Specify only the unit name with this command.

Windows

Run `HSNM2-xxxx-W-CLI.exe` in the `hsm_win` directory of the DVD-R that was provided. By default, the files are installed in `\Program Files\Storage Navigator Modular 2 CLI\`.

Run `startsnmen.bat`. This is a Windows batch file used to start Storage Navigator Modular 2. The following environment parameters must be set correctly in `startsnmen.bat`:

```
set STONAVM_HOME=.
set LANG=en
```

Use the `set` command to verify the correct setting of the environment parameters on the workstation.

A prompt window appears and Storage Navigator Modular 2 commands can be executed from this window.



NOTE: If you do not use the default path when executing commands, you must setup an environment variable for the path you are using. `STONAVM_HOME` points to the home directory of your installation so it can find the bin directory and the command files. Make sure this variable is set correctly in the startup file (`startsnmen.bat`). If you do not set the `LANG` variable in the `startsnmen.bat` file, then the CLI commands use English as the default language.

For example, if Storage Navigator Modular 2 has been installed in `C:\Storage Navigator Modular 2 CLI`:

```
set STONAVM_HOME=C:\Storage Navigator Modular 2 CLI
set LANG=en
command.com
```

Solaris (SPARC and x86 32 Bits OS)

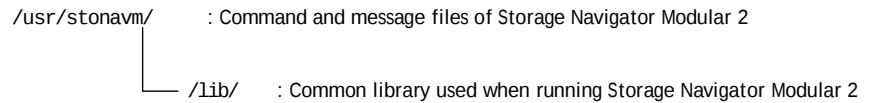
1. Start the SUN[®] server/workstation.
2. Create a new directory (e.g., `/usr/stonavm`).

3. Copy the HSNM2-xxxx-S-CLI.tar file (for SPARC) or the HSNM2-xxxx-S-P-CLI.tar file (for x86 32 bits OS) from the snm_sol_CLI directory in the DVD-R, to the directory created in the hard disk.
4. The HSNM2-xxxx-S-CLI.tar file is a Tar format file, and you must expand it (if the directory described below is present, create another directory).

For example:

```
tar xvf HSNM2-XXXX-S-CLI.tar
```

When setting /usr/stonavm in the installation directory, the following file structure is developed.



5. Add a path in the common library with the LD_LIBRARY_PATH environment variable. For example, when setting DFHOME as the installation directory:

If the LD_LIBRARY_PATH environment variable is not defined (using C shell commands):

```
% setenv LD_LIBRARY_PATH ${DFHOME}/lib
```

If the LD_LIBRARY_PATH environment variable is defined (using C shell commands):

```
% setenv LD_LIBRARY_PATH $LD_LIBRARY_PATH:${DFHOME}/lib
```

6. In the STONAVM_HOME environment variable, set up a path to the directory where Storage Navigator Modular 2 is installed. For example, when setting DFHOME as the installation directory (using C shell commands):

```
% setenv STONAVM_HOME ${DFHOME}
```

7. Define statements 5 and 6 in the initial setting file (for C shell: .login) of the login shell.
8. Log in again.

Red Hat Linux

1. Create a new directory (e.g., /usr/stonavm).
2. Copy the HSNM2-xxxx-L-CLI.tar file from the snm_linux directory in the DVD-R, to the directory created in the hard disk.
3. The HSNM2-xxxx-L-CLI.tar file is a Tar format file, and you must expand it (if the directory described below is present, create another directory). For example:

```
tar xvf HSNM2-XXXX-L-CLI.tar
```

When setting /usr/stonavm as the installation directory, the following file structure is developed.

`/usr/stonavm/` : Command and message files of Storage Navigator Modular 2
`/lib/` : Common library used when running Storage Navigator Modular 2

4. Add a path in the common library to the `LD_LIBRARY_PATH` environment variable.

If the `LD_LIBRARY_PATH` environment variable is not defined (using C shell commands):

```
% setenv LD_LIBRARY_PATH ${DFHOME}/lib
```

If the `LD_LIBRARY_PATH` environment variable is defined (this example uses C shell commands):

```
% setenv LD_LIBRARY_PATH $LD_LIBRARY_PATH:${DFHOME}/lib
```

5. In the `STONAVM_HOME` environment variable, set up a path to the directory where Storage Navigator Modular 2 is installed. For example, when setting `DFHOME` as the installation directory (using C shell commands):

```
% setenv STONAVM_HOME ${DFHOME}
```

6. Define statements 4 and 5 in the initial setting file (for C shell: `.login`) of the login shell.

Log in again.

Setting Linux Kernel Parameters

When installing Hitachi Storage Navigator Modular 2 to Linux, you must set the Linux kernel parameters to required values. If you do not set the Linux kernel parameters, the HSNM2 installer terminates abnormally. When the application has already been installed and used in an environment that contains the Hitachi Storage Command Suite Common Component, you do not need to set the Linux kernel parameters.

To set the Linux kernel parameters:

1. Back up the existing kernel parameters setting files

```
/etc/sysctl.conf
```

```
/etc/security/limits.conf
```

2. Open the kernel parameters setting file (`/etc/sysctl.conf`) with a text editor and change the contents referring to the following conventions, requirements, and methods.

- The parameters are specified using the syntax:

```
[name_of_parameter]=[value]
```

- Four values, each separated by a space are specified in the file `kernel.sem`.
- The parameter must not exceed the maximum value that the operating system specifies.
- You can check the value by issuing the following command:

```
cat /proc/sys/kernel/shmmax
```

This command checks the values contained in the `kernel.shmmax` file.

- The following table details recommended values and calculation methods for each parameter.

Table 2-3: Linux Kernel Recommended Values and Calculation Methods

Parameter Name	Recommended Value		Calculation Method
	Navigator 2	Database	
<code>kernel.shmmax</code>	11666432	200000000	The maximum value in current and two recommended value.
<code>kernel.shmall</code>	26214400	26214400	The total value of the current value and the recommended value.
<code>kernel.shmmni</code>	0	2000	The larger value in following: - The total value of the current and Navigator 2 recommended value. - The database recommended value.
<code>kernel.threads-max</code>	184	576	
<code>kernel.msgmni</code>	44	44	
<code>kernel.sem</code> (Second parameters)	80	7200	
<code>kernel.sem</code> (Fourth parameters)	9	1024	
<code>fs.file-max</code>	53898	53898	

3. Using a standard text editor, open the kernel parameters setting file:

- For Red Hat Enterprise Linux 5.x and 6.x: `/etc/security/limits.conf`
- For Red Hat Enterprise Linux 6.x: `/etc/security/limits.d/90-nproc.conf` for Red Hat Enterprise Linux 6.x.
- For Red Hat Enterprise Linux 5.x: the **nofile** and **nproc** parameters are in the `limits.conf` file. The **nproc** parameters are in the `90-nproc.conf` file.

The parameters are specified using the following syntax:

`[domain][type][parameter_name][value]`

The domains are specified for “*”. The types are specified for both “soft” and “hard” values. The soft value must exceed the hard value. Then, the parameter must not exceed the maximum value the operating system specifies.

Parameter Name	Recommended Value		Calculation Method
	Navigator 2	Database	

Parameter Name	Recommended Value		Calculation Method
nfile	572	1344	The larger value in the following: - The total value of the current and Navigator 2 recommended values. - The database recommended value.
nproc	165	512	

HP-UX

1. Start the HP server/workstation.
2. Create a new directory (e.g., /usr/stonavm).
3. Copy the HSNM2-xxxx-H-CLI.tar file from the snm_hpux directory in the DVD-R, to the directory created in the hard disk.
4. The HSNM2-xxxx-H-CLI.tar file is a Tar format file, and you must expand it (if the directory described below is present, create another directory). For example:

```
tar xvf HSNM2-XXXX-H-CLI.tar
```

5. When setting /usr/stonavm as the installation directory, the following file structure is developed.

```

/usr/stonavm/      : Command and message files of Storage Navigator Modular 2
└── /lib/         : Common library used when running Storage Navigator Modular 2

```

6. Add a path in the common library to the SHLIB_PATH environment variable. For example, when setting DFHOME as the installation directory:

If the SHLIB_PATH environment variable is not defined (using C shell commands):

```
% setenv SHLIB_PATH ${DFHOME}/lib
```

If the SHLIB_PATH environment variable is defined (using C shell commands):

```
% setenv SHLIB_PATH $SHLIB_PATH:${DFHOME}/lib
```

7. In the STONAVM_HOME environment variable, set up a path to the directory where Storage Navigator Modular 2 is installed, For example, when setting DFHOME as the installation directory (using C shell commands):

```
% setenv STONAVM_HOME ${DFHOME}
```

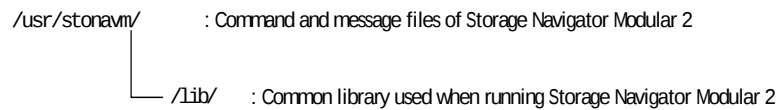
8. Define statements 5 and 6 in the initial setting file (for C shell: .login) of the login shell.
9. Log in again.

AIX

1. Start the IBM server/workstation.
2. Create a new directory (e.g., /usr/stonavm).
3. Copy the HSNM2-xxxx-A-CLI.tar file from the snm_aix directory in the DVD-R, to the directory created in the hard disk.
4. The HSNM2-xxxx-A-CLI.tar file is a Tar format file, and you must expand it (if the directory described below is present, create another directory). For example:

```
tar xvf HSNM2-XXXX-A-CLI.tar
```

When setting /usr/stonavm as the installation directory, the following file structure is developed.



5. Add a path in the common library to the LIBPATH environment variable. For example, when setting DFHOME as the installation directory:
If the LIBPATH environment variable is not defined (using C shell commands):

```
% setenv LIBPATH ${DFHOME}/lib
```

If the LIBPATH environment variable is defined (using C shell commands):

```
% setenv LIBPATH $LIBPATH:${DFHOME}/lib
```

6. In the STONAVM_HOME environment variable, set up a path to the directory where Storage Navigator Modular 2 is installed. For example, when setting DFHOME as the installation directory (using C shell commands):

```
% setenv STONAVM_HOME ${DFHOME}
```

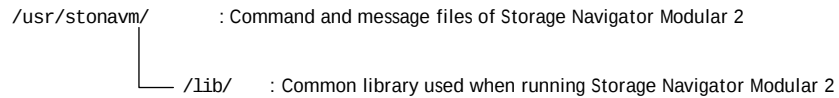
7. Define statements 5 and 6 in the initial setting file (for C shell: .login) of the login shell.
8. Log in again.

IRIX

1. Start the SGI server/workstation.
2. Create a new directory (e.g., /usr/stonavm).
3. Copy the HSNM2-xxxx-I-CLI.tar file from the snm_iris directory in the DVD-R, to the directory created in the hard disk.
4. The HSNM2-xxxx-I-CLI.tar file is a Tar format file, and you must expand it (if the directory described below is present, create another directory). For example:

```
tar xvf HSNM2-XXXX-I-CLI.tar
```

When setting /usr/stonavm as the installation directory, the following file structure is developed.



5. Add a path in the common library to the LD_LIBRARY_PATH environment variable.

If the LD_LIBRARY_PATH environment variable is not defined (using C shell commands):

```
% setenv LD_LIBRARY_PATH ${DFHOME}/lib
```

If the LD_LIBRARY_PATH environment variable is defined (using C shell commands):

```
% setenv LD_LIBRARY_PATH $LD_LIBRARY_PATH:${DFHOME}/lib
```

6. In the STONAVM_HOME environment variable, set up a path to the directory where Storage Navigator Modular 2 is installed. For example, when setting DFHOME as the installation directory (using C shell commands):

```
% setenv STONAVM_HOME ${DFHOME}
```

Define statements 5 and 6 in the initial setting file (for C shell: .login) of the login shell.

7. Log in again.

Updating Storage Navigator Modular 2

This section provides instructions for updating Storage Navigator Modular on the following systems:

- Windows
- Solaris
- Red Hat Linux
- HP-UX
- AIX
- IRIX



NOTE: After updating Storage Navigator Modular 2, close it and then restart it.

Windows

Run HSNM2-xxxx-W-CLI.exe in the `nm_win_CLI` directory of the DVD-R that was provided.

Solaris (SPARC and x86 32 Bits OS)

1. Copy the HSNM2-xxxx-S-CLI.tar file or the HSNM2-xxxx-S-P-CL.tar file (for x86 32 bits OS) from the snm_sol_CLI directory in the DVD-R, to the directory created in the hard disk.
2. The HSNM2-xxxx-S-CLI.tar file is a Tar format file, and you must expand it. For example:

```
tar xvf HSNM2-XXXX-S-CLI.tar
```

Red Hat Linux

1. Copy the HSNM2-xxxx-L-CLI.tar file from the snm_linux_CLI directory in the DVD-R, to directory created in the hard disk.
2. The HSNM2-xxxx-L-CLI.tar file is a Tar format file, and you must expand it. For example:

```
tar xvf HSNM2-XXXX-L-CLI.tar
```

HP-UX

1. Copy the HSNM2-xxxx-H-CLI.tar file from the snm_hpux_CLI directory in the DVD-R, to directory created in the hard disk.
2. The HSNM2-xxxx-H-CLI.tar file is a Tar format file, and you must expand it. For example:

```
tar xvf HSNM2-XXXX-H-CLI.tar
```

AIX

1. Copy the HSNM2-xxxx-A-CLI.tar file from the snm_aix_CLI directory in the DVD-R, to directory created in the hard disk.
2. Run the slibclean command. If you do not have root permission for this command, delete the library file libdau.a.
3. The HSNM2-xxxx-A-CLI.tar file is a Tar format file, and you must expand it. For example:

```
tar xvf HSNM2-XXXX-A-CLI.tar
```

IRIX

1. Copy the HSNM2-xxxx-I-CLI.tar file from the snm_irix_CLI directory in the DVD-R, to directory created in the hard disk.
2. The HSNM2-xxxx-I-CLI.tar file is a Tar format file, and you must expand it. For example:

```
tar xvf HSNM2-XXXX-I-CLI.tar
```

Uninstalling

This section provides instructions for uninstalling Storage Navigator ModularStorage Navigator Modular 2 on the following systems: Windows, Solaris, IRIX, HP-UX, AIX, and Red Hat Linux.

Windows

1. Delete the Storage Navigator ModularStorage Navigator Modular 2 program using the Add and Delete Application icon in the Control Panel. Because the folders created by the installation are deleted, move the necessary files before uninstalling.

Solaris, IRIX, HP-UX, AIX, and Red Hat Linux

1. Delete the directory and all the files that were created in the hard disk for when Storage Navigator ModularStorage Navigator Modular 2 was installed.
2. Delete the statement path to the common library, from the contents of the environment variable.
3. Delete the reference to the STONAVM_HOME environment variable.



NOTE: Functions listed as “management mode” are intended only for maintenance technicians or qualified users.

CLI command list

This chapter lists the supported CLI commands and covers the following topics:

- ❑ [Overview](#)
- ❑ [Command format and command types](#)
- ❑ [Commands for registering an array](#)
- ❑ [Setting a password in administration mode](#)
- ❑ [Displaying array status](#)
- ❑ [RAID/volume commands](#)
- ❑ [System parameters](#)
- ❑ [Setting up configuration](#)
- ❑ [File output of configuration and configuration setting by file](#)
- ❑ [Host groups information](#)
- ❑ [Target information](#)
- ❑ [NNC parameters](#)
- ❑ [Monitoring errors](#)
- ❑ [Tuning parameters](#)
- ❑ [Miscellaneous commands](#)

Overview

This chapter describes the Storage Navigator Modular 2 commands. All commands can be used as the standard commands.

When using an administration command, a password must be specified. This password is for the workstation where the commands are executed, and is stored in a password file on this workstation. The administration commands that require passwords have an O under the Password column, and are optional. The commands that can be used online have an O under the Online use column.

Additionally, when the optional Password Protection function is installed on the array, some commands require a user ID and password. The commands that require a login have an O under the Login column.



NOTE: Unless you are monitoring errors, do not work online, because your connection may time out.



CAUTION! The Storage Navigator Modular 2 CLI is intended for users who have significant storage management expertise and previous experience using a CLI to manage storage. Improper CLI use can damage the software installed on the Simple Modular Storage 100 (SMS) or Adaptable Modular Storage (AMS) systems and will void the Hitachi warranty and support. Do not create, delete or modify and RAID Group settings, and do not modify the existing Differential Management Logical Unit on the Simple Modular Storage 100 system. Please consult your reseller before using the CLI.

Table 3-1: Storage Navigator 2 CLI commands

Classification	Function	Command	Online Use	Pass word	Login
Array registration	Displaying the Registration Information	auunitref	O	x	x
	Automatic Registering	auunitaddauto	O	x	x
	Registering	auunitadd	O	x	x
	Changing Registration Information	auunitchg	O	x	x
	Deleting the Registration Information	auunitdel	O	x	x
	Setting a Password in Administration Mode	aupasswd	O	O	x
Array management by user ID (Password Protection Feature)	Setting user ID	auuidadd	O	O	O
	Changing user ID	auuidchg	O	O	O
	Deleting user ID	auuidel	O	O	O
	Changing password	aupwdchg	O	O	O
	Logging into array unit	aulogin	O	O	x
	Logging out from array unit	aulogout	O	O	O
	Checking login	auchkuid	O	x	O

Table 3-1: Storage Navigator 2 CLI commands (Continued)

Classification	Function	Command	Online Use	Pass word	Login
Array status	Displaying a Firmware Revision	aurev	O	x	x
	Displaying Drive Configuration Information	audrive	O	x	x
	See section Displaying the cache configuration information on page 3-37 for an example of displayed output for the drive information of an array unit HUS 130. Example % audrive -unit df85xs - vendor Unit HDU Capacity Drive Type Rotational Speed Vendor ID Product ID Revision Serial No. 0 0 Displaying the Cache Configuration Information (See Note 2.) SAS (SFF) 10000rpm SEAGATE DKS5C-J600SS 5C00 6WN01SLP 0 1 600GB SAS(SFF) 10000rpm SEAGATE DKS5C-J600SS 5C00 6WN02TK4 : : %	aucache	O	x	x
	Displaying the Status of Power Supply/Fan/Battery/Loop/ENC (See Note 2.)	ausupply	O	x	x
	Displaying the Status of Controller/Cache/Power Supply/Fan/Battery/Loop/ENC/NNC Parts (See Note 2.)	auparts	O	x	x
	Referencing Parts Options	aupartsopt	O	x	x
	Displaying the Current IP Address	aucrln	O	x	x
	Displaying the Information Messages	auinfomsg	O	x	O
	Referencing/Setting the Equipment ID or Controller ID	auunitid	O	O	x
	Displaying the Equipment Information	auunitinfo	O	x	x

Table 3-1: Storage Navigator 2 CLI commands (Continued)

Classification	Function	Command	Online Use	Pass word	Login
RAID/Logical Unit	Referencing a RAID Group	aurgref	O	x	x
	Setting Up a RAID Group	aurgadd	O	O	O
	Expanding a RAID Group	aurgexp	O	O	O
	Deleting the RAID Group	aurgdel	x	O	O
	Referencing a Logical Unit	auluref	O	x	x
	Setting Up a Logical Unit	auluadd	O	O	O
	Formatting the logical unit	auformat	O	O	O
	Displaying the Progress of Logical Unit Formatting	auformatst	O	x	x
	Referencing/Setting the Quick Format Option	auquickfmtree	O	O	O
	Expanding a logical unit	auluexp	O	O	O
	Deleting the logical unit	auludel	x	O	O
	Changing the Default Controller of	auluchg	O	O	O
	Referencing the Unified	aumluref	O	x	x
	Unifying Logical Units	aulumrg	O	O	O
	Separating LUs	auludiv	O	O	O
	Invalidating a logical unit	auluinvalidate	O	O	O
	Reassigning a Logical Unit	aulureallocate	O	O	O
	Restoring a Logical Unit	aulurestoration	O	O	O
	Referencing/Starting/Skipping/Canceling the Parity Correction Online	aulucorrect	O	O	O
	Referencing/Setting the Mapping Guard Information	aumapguard	O	O	O
	Referencing/Setting LU Cache Partition	aulucachept	x	O	O
	Changing the LU Size	auluchgsize	O	O	O

Table 3-1: Storage Navigator 2 CLI commands (Continued)

Classification	Function	Command	Online Use	Pass word	Login
System parameters	Referencing/Setting System Parameters	ausystemparam	O	O	O
	Referencing/Setting System Parameters Online	auonsysprm	O	O	O
	Referencing/Setting System Parameters	ausysparam	x	O	O
	Referencing/Setting the RTC	aurtc	O	O	O
	Referencing/Setting LAN Information (See <i>Note 1.</i>)	aulan	x	O	O
	Referencing/Setting the Port Option (See example below.)	auportop	O	O	O
	Referencing/Setting the Boot Option (See <i>Note 1.</i>)	aubootopt	x	O	O
	Referencing/Setting Time Zone	autimezone	O	O	O
	Referencing/Setting the IP Address of Maintenance Port	aumaintelan	O	O	O
	Referencing/Setting LAN Information Online	auonlan	O	O	O

Table 3-1: Storage Navigator 2 CLI commands (Continued)

Classification	Function	Command	Online Use	Pass word	Login
Setting up configuration	Referencing/Setting the Fibre Channel Information	aufibre1	O	O	O
	Referencing/Setting the Spare HDU	auspare	O	O	O
	Referencing/Setting the Fee-Basis Option (See Note 4.)	auopt	O	O	O
	Referencing/Setting the Drive Restoration Control Information	audrecopt	O	O	O
	Referencing/Setting the Online Verify Information	auonlineverify	O	O	O
	Referencing/Setting the Command Device Information.	aucmddev	O	O	O
	Rebooting	aureboot	x	O	O
	Referencing/Setting LU Pre-fetch Information	aulupre	O	O	O
	Referencing/Splitting the Hi-Copy Pair Information	auhicopy	O	O	O
	Referencing/Setting the DM-LU Information	audmlu	O	O	O
	Referencing/Setting the iSCSI Port Information	auiscsi	O	O	O
	Referencing/Setting the iSNS Information. See example below.	auisns	O	O	O
	Referencing/Setting the CHAP User Information	auchapuser	O	O	O
	Referencing/Sending Ping	auping	O	O	O
	Referencing/Setting the Backend Diagnosis Information	aubackenddiag	O	O	O
	Setting the SNMP Environment Information and Outputting Its File	ausnmp	O	O	O
	Referencing/Setting E-Mail Alert Information	auemailalert	O	x	x
	Referencing/Setting the LED Information	aulocatled	O	x	x
	Referencing/Addition Start of Additional Unit Information	auadditionalunit	O	x	x
	Referencing/Setting LAN Port information	aulanport	O	x	x
	Setting the SSL Option	ausslopt	O	x	x

Table 3-1: Storage Navigator 2 CLI commands (Continued)

Classification	Function	Command	Online Use	Pass word	Login
	Referencing /Setting the UPS Information	auups	x		x
	Referencing/Setting the Host Response	auhostresp	O		x
	Referencing/Setting the SSD Endurance Information	aussdendurance	O	x	x
	Adding/Removing the I/F Modular/Interface Board	aupartinterface	O	O	O
	Referencing/Setting the Endurance Information	aussdfmdendurance	O	O	O
	Referencing/Setting the FMD Battery Life information	aufmdbatterylife	O	O	O
	Referencing the Host Login Information	auhostlogininfo	O	x	x
Save configuration information in file and setup configuration information from file	File Output of the System Parameters	ausyspout	O	x	x
	File Output of the Configuration of RAID/LU and Status of Constituent Parts	auconfigout	O	x	x
	Setting the System Parameters with a File	ausyspset	x	O	O
	Setting the RAID/LU Definition with a File	auconfigset	O	O	O
	Import/Export the System Constituent Information (See Note 3.)	auconstitute	O	x	O
	Outputting the RAID Group/LU Information to File				
Host groups information	Referencing/Setting Host Information	auhgwwn	O	O	O
	Referencing/Setting Host Group Options	auhgopt	O	O	O
	Referencing/Setting Mapping Information	auhgmap	O	O	O
	Referencing/Registration/Changing/Deleting Host Group	auhgdef	O	O	O
	File Output of the Host Group Information	auhgout	O	x	O
	Setting the Host Group Information with a File	auhgset	O	O	O

Table 3-1: Storage Navigator 2 CLI commands (Continued)

Classification	Function	Command	Online Use	Pass word	Login
Target information	Referencing/Setting iSCSI Target Information	autargetdef	O	O	O
	Referencing/Setting the Initiator Information	autargetini	O	O	O
	Referencing/Setting iSCSI Target Options	autargetopt	O	O	O
	Referencing/Setting iSCSI Target Mapping Information	autargetmap	O	O	O
Microprogram (firmware) updating	Downloading/Updating firmware	aumicro	O	O	O
NNC parameters	Referencing/Setting NNC LAN Information	aunnclan	O	O	O
	Displaying/Setting NAS System LU	aunassyslu	O	x	O
	Referencing/Setting NAS User LU	aunasuserlu	O	x	O
	Referencing/Shutdown/Booting/Rebooting NNC	aunnc	x	O	O
	Displaying Statistical Information	austatistics	O	x	x
Obtaining performance information	Outputting Performance Information File	auperform	O	x	x
	Referencing/Setting the Collection State of Performance Statistics Information	aupfmstatiscfg	O	O	x
	Referencing the DP Pool Trend/Outputting its File	audptrend	O		x
Monitoring errors	Setting the Starting of Application	auextprog	O	x	x
	Monitoring Errors	auerroralert	O	x	x
	Referencing/Setting the Monitoring Error Options	auerralertopt	O	x	x
Tuning parameters	Referencing/Setting System Tuning Parameters (See Note 1.)	ausystuning	x	O	O
	Referencing/Setting LU Tuning Parameters	aulutuning	O	O	O
	Referencing/Setting Prefetch Tuning Parameters	autuningprefetch	*	O	O
	Referencing/Setting Multi Stream Tuning Parameters	autuningmultistream	O	O	O
	Referencing/Setting LU Ownership Tuning Parameters	autuningluown	O	O	O

Table 3-1: Storage Navigator 2 CLI commands (Continued)

Classification	Function	Command	Online Use	Pass word	Login
Account authentication	Setting/Deleting the Account Information For Script	auaccountenv	O	x	x
	Referencing/Setting the Account Options	auaccountopt	O		x
	Starting/Finishing the Account Script	auaccountscript	O		
	Referencing/Setting the Account Information	auaccount	O		x
	Referencing/Refreshing/Backing up/Restoring the key information of the self encryption drive	auencrypt	O		x
Help	Displaying command help	auaman	O	x	x



NOTE: Changed settings do not become effective until the array is restarted. However, when connecting the AMS200/500/1000, SMS100, or, AMS2100/2300/2500 restarting is not required.

The auparts command includes the function of the aucache and ausupply commands. The aucache and ausupply commands cannot be used by the 9580V, SMS100, AMS2100/2300/2500.

Importing the boot options is not effective until the array is restarted.

Some free-basis options do not function until the array is restarted.

Set items do not become effective until the array unit is restarted. However, when connecting the 9500V, SMS100, AMS2100/2300/2500, restarting is not necessary.

If the reference (-refer) is specified by the option, the commands can be executed without logging in.

Examples of output for selected commands

This section contains output for selected commands. Output sections will be selectively added upon each new revision of HSNM2.

Example of aiscsi output

The following example displays the iSCSI port information by issuing the aiscsi command of an array unit hus110a1.

```
% aiscsi -unit hus110a1 -refer
Port 0A
Port Number      : 3260
Keep Alive Timer[sec.] : 60
MTU              : 1500
Transfer Rate    : 1Gbps
Link Status      : Link Up
Ether Address    : 00:01:02:03:04:05
IPv4
IPv4 Address     : 100.101.102.103
IPv4 Subnet Mask : 255.255.255.0
```

```

IPv4 Default Gateway : 150.151.152.153
IPv6 Status          : Enable
IPv6
Link Local IP Address
Address Type         : Manual
IP Address           : fe80::2022
Address Status       : ---
Global IP Address
Address Type         : Manual
IP Address 1
IP Address           : 2080::2022
Address Status       : ---
IP Address 2
IP Address           : 2081::2022
Address Status       : ---
Subnet Prefix Length : 22
Default Gateway
IP Address
Current              : 3034::2022
Setting              : 3033::2022
Address Status       : Unconfigured
Link MTU             : 1500
Connecting Hosts     : 10000
Result               : Setting
VLAN Status          : Enable
VLAN ID              : 22
Header Digest        : Enable
Data Digest          : Enable

Port 0B
:
%

```

Example of audrive output

The following example displays the drive information of an array unit HUS 130.

```

% audrive -unit hus130 -vendor
Unit No HDU Capacity Drive Type Rotational Speed Vendor ID Product ID Revision Serial No.
0 0 600GB SAS (SFF) 1000rpm Seagate DKS5C-J600SS 5C00 6WN01SLP
0 1 600GB SAS(SFF) 1000rpm SEAGATE DKS5C-J600SS 5C00 6WN02TK4
:
:
%

```

The following table details all Storage Navigator Modular 2 commands by equipment type for all platforms (the 9500V, AMS/WMS, SMS, AMS 2000, and the HUS 100).

Example of auportop output

The following examples displays the port option of an array unit ams2300a1.

Table 3-2: Storage Navigator Modular 2 commands per equipment type (all platforms)

Command	9500V	AMS/ WMS	SMS	AMS 2000	HUS 100	Command	9500V	AMS/ WMS	SMS	AMS 2000	HUS 100
auunitref						aurtc					
auunitaddauto						aulan			x	x	x
auunitadd						auportop					

**Table 3-2: Storage Navigator Modular 2 commands per equipment type
(all platforms)**

Command	9500V	AMS / WMS	SMS	AMS 2000	HUS 100	Command	9500V	AMS / WMS	SMS	AMS 2000	HUS 100
auunitchg						aubootopt	x				
auunitdel						autimezone	x				
aupasswd						aumaintelan	x				
aurev		x	x	x	x	auonlan	x				
audrive						aufibre1					
aucache		x	x	x	x	auspare			x		
ausupply		x	x	x	x	auopt					
auparts						audrecopt					
aupartsopt	x	x	x			auonlineverify					
aucrlan		x	x	x	x	aucmddev					
auinfomsg						aureboot					
auunitid		x	x	x	x	aulupre		x	x	x	x
auunitinfo	x					auhicopy		x	x	x	x
aurgref						audmlu	x		x		
aurgadd			x			auiscsi	x				
aurgexp		x	x			auisns	x				
aurgdel			x			auchapuser	x				
auluref						auping	x				
auluadd						aubackenddiag			x	x	x
auformat						ausnmp					
auformatst						auemailalert	x	x			
auquickfmtree						aulocatled	x	x	x		
auluexp		x	x	x	x	auadditionalunit	x	x	x		
auludel						aulanport	x	x			
auluchg			x	x	x	ausslopt	x	x			
aumluref						ausyspout		x	x	x	x
aulumrg						auconfigout		x	x	x	x
auludiv						ausyspset		x	x	x	x
auluinvalidate		x	x	x	x	auconfigset		x	x	x	x
aulureallocate		x	x	x	x	auconstitute	x				
aulurestoration		x	x	x	x	auconfigreport	x	x	x		
aulucorrect						auhgwwn					
auhgwwn						aumapguard					
auhgopt						aulucachept	x				
auhgmap						auluchgsize	x	x			
auhgdef						ausystemparam	x				
auhgout		x	x	x	x	auonsysprm		x	x	x	x

**Table 3-2: Storage Navigator Modular 2 commands per equipment type
(all platforms)**

Command	9500V	AMS/ WMS	SMS	AMS 2000	HUS 100	Command	9500V	AMS/ WMS	SMS	AMS 2000	HUS 100
auhgset		x	x	x	x	ausysparam		x	x	x	
autargetdef	x					autargetini	x				
auextprog						autargetopt	x				
auerroralert						autargetmap	x				
auerralertopt						aumicro					
ausystuning						aunnclan	x		x	x	x
aulutuning			x	x	x	aunassyslu	x		x	x	x
autuningprefetch	x		x	x	x	aunasuserlu	x		x	x	x
autuningmultistream	x					aunnc	x		x	x	x
autuningluown	x	x		x		austatistics			x	x	x
auaccountenv	x					auperform					
auaccountscript	x					aupfmstatiscfg					
auman						audptrend					
auencrypt	x	x	x	x		auups	x	x	x	x	
aussdendurance	x	x	x	x		auhostresp	x	x	x	x	
aupartinterface	x	x	x	x		audptier					
aussdfmdendurance	x	x	x	x		aufmdbatteryli	x	x	x	x	x
auhostlogininfo	x	x	x	x			x	x	x	x	

Table 3-3 contains a list of Storage Navigator Modular 2 commands for the HUS 100.

**Table 3-3: Master list of Storage Navigator Modular 2
commands for the HUS**

Command	Function
General	
auunitref	Displaying the Registration Information
auunitaddauto	Automatic Registering
auunitadd	Registering
auunitchg	Changing Registration Information
auunitdel	Deleting the Registration Information
audrive	Displaying Drive Configuration Information

Command	Function
auparts	Displaying the Status of Controller/Cache/Power
Supply / Fan / Battery / Loop / ENC / NNC Parts	
auformat	Formatting the LU
auformatst	Displaying the Progress of LU Formatting
auquickfmtopt	Referencing/Setting the Quick Format Option
auluchgsize	Changing the LU Size
auludel	Deleting the LU
auinfomsg	Displaying the Information Messages
auunitinfo	Displaying the Equipment Information
aurgref	Referencing a RAID Group
aurgadd	Setting Up a RAID Group
aupartsopt	Referencing the parts option.
aurgexp	Expanding a RAID Group
aurgdel	Deleting the RAID Group
auluref	Referencing an LU
auluadd	Setting Up an LU
aulucorrect	Referencing/Starting/Skipping/Canceling the Parity Correction Online
aumapguard	Referencing/Setting the Mapping Guard Information
aulucachept	Referencing/Setting LU Cache Partition
ausystemparam	Referencing/Setting System Parameters
aurtc	Referencing/Setting the RTC
auportop	Referencing/Setting the Port Option and Controller Identifier
aubootopt	Referencing/Setting the Boot Option
autimezone	Referencing/Setting Time Zone
aumaintelan	Referencing/Setting the IP Address of Maintenance Port
auonlan	Referencing/Setting LAN Information Online
aufibre1	Referencing/Setting the Fibre Channel Information
auspare	Referencing/Setting the Spare HDU
auopt	Referencing/Setting the Fee-Basis Option
audrecopt	Referencing/Setting the Drive Restoration Control
Information	
auonlineverify	Referencing/Setting the Online Verify Information

Command	Function
aucmddev	Referencing/Setting the Command Device Information
aureboot	Rebooting
audmlu	Referencing/Setting the DM-LU Information
auiscsi	Referencing/Setting the iSCSI Port Information
ausns	Referencing/Setting the iSNS Information
auchapuser	Referencing/Setting the CHAP User Information
auping	Referencing/Sending Ping
auconstitute	Import/Export the System Constituent Information
aupowersave	Referencing the Power Saving Information/ Spinning down/Spinning up
auadditionalunit	Referencing/Addition Start of Additional Unit
aulocateled	Referencing/Setting the LED Information
auemailalert	Referencing/Setting E-Mail Alert Information
aulanport	Referencing/Setting LAN Port Information
ausslopt	Setting the SSL Option
auloginfo	Referencing/Setting/Resetting the Log Information
auups	Referencing/Setting the UPS Information
auhostresp	Referencing/Setting the Host Response
ausdendurance	Referencing/Setting the SSD Endurance Information
auconfigreport	Outputting the RAID group/LU Information to File
aupartinterface	Adding/Removing the I/F Module/Interface Board
auhgwnn	Referencing/Setting Host Information
auhgopt	Referencing/Setting Host Group Options
auhgmap	Referencing/Setting Mapping Information
auhgdef	Referencing/Registration/Changing/Deleting Host Group
autargetdef	Referencing/Setting iSCSI Target Information
autargetini	Referencing/Setting the Initiator Information
autargetopt	Referencing/Setting iSCSI Target Options
autargetmap	Referencing/Setting iSCSI Target Mapping Information
aumicro	Downloading/Updating Firmware
auperform	Outputting Performance Information File
aupfmstatiscfg	Referencing/Setting the Collection State of Performance Statistics Information

Command	Function
Information	
auextprog	Setting the Starting of Application
auerroralert	Monitoring Errors
auerralertopt	Referencing/Setting the Monitoring Error Options
ausystuning	Referencing/Setting System Tuning Parameters
autuningmultistream	Referencing/Setting Multi Stream Tuning Parameters
autuningluown	Referencing/Setting LU Ownership Tuning Parameters
auman	Referencing the Manual of CLI Commands
auuidadd	Setting the User ID
auuidchg	Changing the User ID
auuiddel	Deleting the User ID
aupwdchg	Changing the Password
aulogin	Logging In and Forcibly Logging In to the Array Unit
aulogout	Logging Out from the Array Unit
auchkuid	Confirming the Login
ausnmp	Setting the SNMP Environment Information and Outputting Its File
aumluref	Referencing the Unified LU
aulumrg	Unifying LUs
aumludiv	Separating LU
aucachept	Referencing/Setting Cache Partition
auturbolu	Setting the Cache Residency LU
auluguard	Referencing/Setting the access level of LU and expiration lock
aureplicationvvol	Referencing/Setting SnapShot Logical Unit
aurmtpath	Referencing/Setting the Remote Path Information
autruecopyopt	Referencing/Setting TrueCopy Option
aureplicationlocal	Local Pair Operation
aureplicationremote	Remote Pair Operation
aureplicationmon	Pair Status Monitoring
auauditlog	Referencing/Setting the Audit Log Information and Export/Initialize the Internal Log
aumvolmigration	Referencing/Setting the Reserve LU Information and Referencing/Creating/Changing/Canceling/Splitting the Volume Migration Pair
auaccount	Referencing/Setting the Account Information

Command	Function
auaccountenv	Setting/Deleting the Account Information For Script
auaccountopt	Referencing/Setting the Account Options
auaccountscript	Starting/Finishing the Account Script
audppool	Referencing/Setting the DP Pool Information
audptrend	Referencing the DP Pool Trend/Outputting its File
audpoptimize	Referencing/Starting/Canceling/Changing the DP Optimization
auenvinfo	Referencing the Environment Information
audptier	Referencing/Setting the DP Tier management information
aussdfmdendurance	Referencing/Setting the Endurance Information
aufmdbattery	Referencing/Setting the FMD Battery Life Information
auhostlogininfo	Referencing the Host Login Information

Notes at the time of functional operation

The following sections describe aspects of operation with logical units.

Logical units formatting

Restrictions apply to the total size of logical units that can be formatted at the same time. If the possible formatting size is exceeded, the storage system firmware does not execute the formatting and error messages display. Also, if the logical units expand, the expanded logical unit size automatically formats and becomes the restriction target of the size that can be formatted at the same time.

The possible formatting size differs, depending on the storage system type. Format the total size of the logical units by the recommended batch formatting size or less as shown in the table below.

AMS	Recommended Batch Formatting Size		
2500	359 TB (449 GB x 800)	308 TB (193 GB x 1,600)	208 TB (65 GB x 3,200)
2300	287 TB (449 GB x 640)	247 TB (193 GB x 1,280)	166 TB (65 GB x 2,560)
2100	179 TB (449 GB x 400)	154 TB (193 GB x 800)	104 TB (65 GB x 1,600)

The formatting executes in the following three operations. However, it has no effect on the DP volumes using the Dynamic Provisioning function.

Operation	Formatting Capacity
Logical units creation (format is specified).	Size of logical units to create.
Logical units format	Size of logical units to format.
Logical units expansion.	Size of logical units to expand.

The restrictions of the possible formatting size become the size of totaling three operations. Perform it so that the total of each operation becomes the recommended batch formatting size or less.

When the above-mentioned operation executes and the restrictions of the possible formatting size are exceeded, the following messages display:

Operation	Formatting Capacity
Logical units creation (format is specified).	DMED100005: The quick format size is over maximum value. Please retry after that specified quick format size is decreased or that the current executed the quick format is finished.
Logical units format	
Logical units expansion.	DMED0E0023: The quick format size is over maximum value. Please retry after that specified quick format size is decreased or the current executed quick format is finished.

Logical units creation (format is specified)

If the logical units creation (format is specified) becomes an error, the logical units are created, but the formatting is not expected and the Status that displaying the auluref command executing becomes Unformat. After checking that the Status of logical units which are already executing the other formatting or expansion of the other logical units becomes Normal, execute only the formatting for the logical units which performed the creation of logical units.

Logical units format

If the formatting of logical units becomes an error, the formatting is not executed and the Status that displays the uluref command executing is still kept as before the execution. After checking that the Status of logical units which are already executing the other formatting or expansion, the other logical units become Normal, execute the formatting again.

Logical units expansion

If the expansion of logical units becomes an error, the expansion is not executed and the Status that displays the auluref command executing remains in the same state that it did before the execution.

After checking that the **Status** of logical units which are already executing the other formatting or expansion, and the other logical units go into a **Normal** state, execute the expansion again.

Importing the constitute information

When importing the constitute information (auconstitute command) of DP pools or logical units, even if the Full Capacity Mode is set to Enabled, it is crated as if the Full Capacity Mode is in a Disabled state. Set the Full Capacity Mode to Enabled again after the DP pool with the relevant DP-VOLs has completed.

Mapping Mode

If you change the mapping mode from Enabled to Disabled, all the configured mapping information is initialized. If you want to set the mode to Enabled, set the mapping information again.

Command specifications

When changing the TCP/IP port number of the array unit when the SMS 100, AMS200/500/1000, WMS100, AMS 2100/2300/2500, array unit with the firmware version of 0726/E or later (9500V with firmware version x65B/H or later) is connected from a LAN, register the changed port number as **df-damp-snm port number / TCP** in the services file of the OS on which Storage Navigator Modular 2 is installed before starting Storage Navigator Modular. If it is not registered, the array unit may not be able to be connected to the LAN.

Command format and command types

The command format of Storage Navigator Modular is specified with a command name and succeeding options as shown below. When specifying multiple options, the order in which options are specified does not matter. In addition, options may be omitted depending the type of commands. The following example details Storage Navigator Modular 2 CLI command format.

Command Option1 Option2 Option3

Storage Navigator Modular 2 commands are classified mainly into **standard** and **administrator** commands. The following describes specifications of each type of command. When operating the SMS100 or AMS2000 (DF800), the setting of the management commands is not required because all commands can be used as the standard commands.

Standard commands

The standard commands are used for displaying information. The following syntax example shows the Standard Command Format in instances of a normal termination.

```
% Command Option1 Option2 Option3
Result
%
```

The following syntax example shows the Standard Command Format in instances where an error is detected.

```
% Command Option1 Option2 Option3
Error message
%
```

Administration commands

The administration commands are used when operating the 9500V and AMS200/500/1000, WMS100 and setting up a configuration for the array. Taking into consideration the integrity and security of data, this command prompts you to enter a password and is executed if the password is authenticated. When the option -refer is specified (for example, in the command aufibre1), a password is not required.

Command Option1 Option2 Option3 Password: (Enter an already-set password) %5-4 an%Command Option1 Option2 Option3 Password: (Enter an already-set password) Are you executing? (y/n [n]) %d 5-5 show the formats for the administration command. When performing operations associated with data configurations, such as the deletion of a RAID or logical unit, these commands prompt you to confirm whether or not to execute the function after entering a password (se%Command Option1 Option2 Option3 Password: (Enter an already-set password) Are you executing? (y/n [n]) %e 5-5).

The following example shows format 1 of an administration command.

```
Command Option1 Option2 Option3 ....
Password: (Enter an already-set password)
%
```

The following example shows format 2 of an administration command.

```
%Command Option1 Option2 Option3 ....
Password: (Enter an already-set password)
Are you executing? (y/n [n])
%
```

Displaying command syntax

When you want to reference the syntax of a command, specify the -help option in the command. The Usage information appears, as shown in the example.

The descriptions that appear under Usage are the same as those described in the Format of each command. The following example displays command syntax command list.

```
% auunitadd -help
Hitachi Storage Navigator Modular 2
Version xx.xx
Copyright (C) 2005, 2011, Hitachi, Ltd.

Usage:

9500V, AMS, WMS, SMS, AMS2000, HUS

Single system

auunitadd [ -unit unit_name ] [ -group group_name ]

[ -RS232C | -LAN ]

-ctl0 device | address [ -ignore ]

[ -communicationtype nonsecure | secure | securepriority ]

Dual system

auunitadd [ -unit unit_name ] [ -group group_name ]

[ -RS232C | -LAN ]

[ -ctl0 device | address ] [ -ctl1 device | address ]

[ -ignore ]

[ -communicationtype nonsecure | secure | securepriority ]

%
```

To view the entire list of supported commands by storage system type, execute the auhelp.bat file.

Command help

When using the auman command, commentaries of each command described in this manual display.

The auman format is shown in the following example:

Command name

```
auman Referencing the CLI Commands
```

Format

```
9500V, AMS, WMS, SMS, AMS2000, HUS
auman [ -en | -jp ] command_name
```

Description

This command references the CLI commands.

Options

-en | -jp

Specify the locale for displaying the manual.

-en: Displays the manual in English.

-jp: Displays the manual in Japanese.

command_name

Specify the command name that the manual will be displayed.

This is an example for the auunitref command help.

% auman -en auunitref

Copyright (C) 2005, 2011, Hitachi, Ltd.

Command name

auunitref Displaying the Registration Information

Format

9500V, AMS, WMS, SMS, AMS2000, HUS

auunitref [-unit unit_name]

Description

This command displays the registration information of an array unit that is registered in the Navigator.

Omitting the array unit name displays a list of information registered in the Navigator.

Specifying an array unit name displays information about the specified array unit.

Options

-unit unit_name

Specify the name of an array unit whose registration information is to be referred.

Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "(minus)", "_ (underline)", ".", "(period)", "@", or " (space)".

Space in front and in the rear of the character string is removed.

%

To view the entire list of supported commands by storage system type, execute the auhelp.bat file.

Setting the TCP/IP port number

This example is used for editing the services file in Windows 2000.

1. Set the port number between 1024 and 49151.



NOTE: When the TCP/IP port number is set out of a range of 1024 to 49151 and the number is already used in the management ports, it may be forcibly changed to 1024 in some cases.

2. Add the port number to be used by Storage Navigator Modular 2. Refer to the following example, and then overwrite and save it. When adding the port number to the last line, start a new line.

```
# Copyright (c) 1993-1999 Microsoft Corp.
#
# This file contains port numbers for well-known services defined by IANA
#
# Format:
# <service name> <port number>/<protocol> [aliases...] [#<comment>]
#
echo          7/tcp
echo          7/udp
:
:
knetd         2053/tcp          #Kerberos de-multiplexor
man           9535/tcp          #Remote Man Server
df-damp-snm   23456/tcp
```

Commands for registering an array

This section covers the following commands related to registering arrays:

- [Displaying the registration information on page 3-24](#)
- [Automatic registering on page 3-25](#)
- [Registering on page 3-27](#)
- [Changing registration information on page 3-30](#)
- [Deleting the registration information on page 3-32](#)

Displaying the registration information

Command name

auunitref

Format

9500V, AMS, WMS, SMS, AMS2000, HUS
auunitref [-unit unit_name]

Description

This command displays the registration information of an array that is registered in Storage Navigator Modular 2. Omitting the array name displays a list of information registered in Storage Navigator Modular 2. Specifying an array name displays information about the specified array.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.

This example displays all the registered information.

```
% auunitref

Name                                     Group
Type   Construction Connection Type Error Monitoring Communication Type IP Ad
dress/Host Name/Device Name

sms100

  SMS100 Dual      TCP/IP(LAN)  Enable    Non-secure    192.168.3.100
192.168.3.101

ams500

  AMS500 Dual      TCP/IP(LAN)  Enable    Non-secure    192.168.3.102
192.168.3.103
AMS2300_85000045 IPv6
  AMS2300 Single   TCP/IP(LAN)  Enable    Non-secure    fe80:
:020a:e4ff:ff67:6ee8
%
```

This example displays the registration information for a specified array.

```
% auunitref -unit sms100

Name                                     Group
Type   Construction Connection Type Error Monitoring Communication Type IP Ad
dress/Host Name/Device Name
sms100
SMS100 Dual      TCP/IP(LAN)   Enable      Non-secure      192.1
68.3.100 192.168.3.101
%
```

Automatic registering

Command name

```
auunitaddauto
```

Format

```
9500V, AMS, WMS, SMS, AMS2000, HUS
When searching the disk array units of IPv4.
auunitaddauto -ip from_address to_address
[ -communicationtype nonsecure | secure | securepriority ]

SMS, AMS2000, HUS
When searching the disk array units of IPv6.
auunitaddauto -ipv6
[ -communicationtype nonsecure | secure | securepriority ]
When searching the disk array units of IPv4 and IPv6.
auunitaddauto -ip from_address to_address -ipv6
[ -communicationtype nonsecure | secure | securepriority ]
```

Description

This command searches for arrays connected via the TCP/IP, within the specified IP address, and registers the ones that are found. When the search is completed, select the arrays that you want to register by specifying their numbers from the list. When you specify more than one number, insert a space between the numbers. When you specify a range of numbers, insert a hyphen between the numbers. 4096 array units can be registered at maximum.

The name to be registered is given as the array model name_serial number (for example, if an SMS array model name is SMS100 and the serial number is 81010123, the name will be registered is SMS100_81010123.)

The name to be registered IPv6 address is given as “the unit model name_serial number”. (For example, when the unit type is AMS2300, the serial number is 85010123 and IPv6, the name to be registered is “AMS2300_85010123_IPv6”.)

Options

Option	Description
-ip <i>from_address</i> <i>to_address</i>	Specify an IPv4 address of the disk array unit to be searched. <i>from_address</i>: Start IPv4 address <i>to_address</i> : End IPv4 address - Only an address of the fourth byte is effective. - Specify addresses of the first to third bytes as the same ones as the beginning address.
-communicationtype <i>nonsecure</i> <i>secure</i> <i>securepriority</i>	Specify the communication type. <i>nonsecure</i> : Searches disk array units using non-secure port. <i>secure</i> : Searches disk array units using secure port. <i>securepriority</i> : Searches disk array units using secure port or non-secure port in secure port priority.
-ipv6	Search array unit of IPv6.

This example is for registered arrays whose IP addresses are between 192.168.1.1 and 192.168.1.255.

```
% auunitaddauto -ip 192.168.1.1 192.168.1.255
Searching... 192.168.1.255 Detected Count : 2
The subsystem of the following was discovered.
No. Name Type Construction Serial No. Communication Type
1 AMS500_75001000 AMS500 Dual 75001000 Non-secure
IP Address(CTL0) : 192.168.1.250
IP Address(CTL1) : 192.168.1.251
2 SMS100_81001000 SMS100 Single 81001000 Non-secure
IP Address(CTL0) : 192.168.1.252
When you register the two or more numbers, partition the numbers, which are give
n in the list, with the space(s). When you register all subsystems, input 'all'.
Input 'q', then break.
The number of the subsystem to register. (number/all/q [all]): 1 2
AMS500_75001000 has been registered.
SMS100_81001000 has been registered.
The subsystems have been registered successfully.
%
```

This example is for registered arrays whose IP addresses are IPv6.

```
% auunitaddauto -ipv6
Searching... (1/1) fe80::20a:e4ff:fe67:6ee8 Detected Count : 1
The subsystem of the following was discovered.
No. Name Type Construction Serial No. Communication Type
1 AMS500_85000045 IPv6 AMS500 Single 85000045 Non-secure
IP Address(CTL0) : fe80::20a:e4ff:fe67:6ee8
IP Address(CTL1) :
Please specify the number of the subsystem to register.
When you register the two or more numbers, partition the numbers, which are give
n in the list, with the space(s). When you register all subsystems, input 'all'.
Input 'q', then break.
The number of the subsystem to register. (number/all/q [all]): 1
AMS500_85000045_IPv6 has been registered.
The subsystems have been registered successfully.
%
```

Registering

Command name

auunitadd

Format

9500V

Single system

```
auunitadd [ -unit unit_name ] [ -group group_name ]  
          [ -RS232C | -LAN ]  
          -ctl0 device | address [ -ignore ]
```

Dual system

```
auunitadd [ -unit unit_name ] [ -group group_name ]  
          [ -RS232C | -LAN ]  
          [ -ctl0 device | address ] [ -ctl1 device | address ]  
          [ -ignore ]
```

AMS, WMS

Single system

```
auunitadd [ -unit unit_name ] [ -group group_name ]  
          [ -LAN ]  
          -ctl0 address  
          [ -ignore ]
```

Dual system

```
auunitadd [ -unit unit_name ] [ -group group_name ]  
          [ -LAN ]  
          [ -ctl0 address ] [ -ctl1 address ]  
          [ -ignore ]
```

SMS, AMS2000, HUS

Single system

```
auunitadd [ -unit unit_name ] [ -group group_name ]  
          [ -LAN ]  
          -ctl0 address [ -ignore ]  
          [ -communicationtype nonsecure | secure | securepriority ]
```

Dual system

```
auunitadd [ -unit unit_name ] [ -group group_name ]  
          [ -LAN ]  
          [ -ctl0 address ] [ -ctl1 address ]  
          [ -ignore ]  
          [ -communicationtype nonsecure | secure | securepriority ]
```

Description

This command registers an array with Storage Navigator Modular 2. 4096 array units can be registered at maximum. Registration information consists of an array name, a group name, a connection interface, and a communication type.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "- (minus)", "_ (underline)", ". (period)", "@", or " (space)". Space in front and back of the character string is removed.
-group <i>group_name</i>	Specify the name of a group in which multiple array units are managed all together. If this option is omitted, array units are not managed in a group all together. The maximum number of groups registered is 200. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
-RS232C -LAN	Specify the connection interface (RS232C or LAN) to an array unit. If omitted this option, the connection interface to be registered is given as LAN.
-ctl0 <i>device</i> <i>address</i>	Specify the device or address used to connect to Controller 0. If "LAN" is selected, specify an "IP address" or "host name". If "RS232C", specify a "device name". Specify a host name with up to 15 one-byte coded characters. Specify a device name with a RS232C port name or a device file name. (Example: Windows - COM1, Solaris - /dev/ttya)
-ignore	An array unit is not monitored for errors. If omitted this option, an array unit registered is monitored for errors.
-communicationtype nonsecure secure securepriority	Specify the communication type. If omitted this option, non-secure port is used. • nonsecure: Non-secure port • secure: Secure port • securepriority: Secure port When the secure port can not be used, the non-secure port is used.



NOTE: For the dual system disk array unit, only one controller can be used in the LAN connection mode. Specify Controller 0 IP Address/Host Name/Device Name or Controller 1 IP Address/Host Name/Device Name. When registering the array unit in the dual system, verify that you have selected the correct controller for the connection before specifying Controller 0 IP Address/Host Name/Device Name and Controller 1 IP Address/Host Name/Device Name. If you specify the wrong controller, depending on the specified contents, the controller configuration can be set to the opposite controller side.

This example registers a SMS100 with a dual system configuration and a LAN connection interface with an array name of sms100a1.

```
% auunitadd -unit sms100a1 -LAN -ctl0 192.168.1.102 -ctl1 192.168.1.103
Unit sms100a1 has been registered.
%
```

This example registers an AMS2300 with an IPv6 configuration and a LAN connection interface with an array name of ams2300a1.

```
% auunitadd -unit ams2300a1 -LAN -ctl0 fe80::20a:e4ff:fe67:6ee8
Unit ams2300a1 has been registered.
%
```

Changing registration information

Command name

auunitchg

Format

```
9500V
auunitchg -unit unit_name
[ -newunit unit_name ] [ -group group_name ]
[ -RS232C | -LAN ]
[ -ctl0 device | address ] [ -ctl1 device | address ]
[ -watch | -ignore ]
[ -f ]

AMS, WMS
auunitchg -unit unit_name
[ -newunit unit_name ] [ -group group_name ]
[ -LAN ]
[ -ctl0 address ] [ -ctl1 address ]
[ -watch | -ignore ]
[ -f ]

SMS, AMS2000, HUS
auunitchg -unit unit_name
[ -newunit unit_name ] [ -group group_name ]
[ -LAN ]
[ -ctl0 address ] [ -ctl1 address ]
[ -watch | -ignore ]
[ -communicationtype nonsecure | secure ]
[ -f ]
```

Description

This command changes the registration information (array name, group name, connection interface, and communication type) of a registered array. However, omitted items will not be changed.

Options

Option	Description
-newunit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and back of the character string is removed.
-group <i>group_name</i>	Specify the group name to change. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "-", "_ (underline)".
-RS232C -LAN	Specify the connection interface (RS232C or LAN) of an array unit to change.
ctl0 device address	Specify the device or address to change, which address is used to connect to Controller 0. If "LAN" is selected, specify an "IP address" or "host name". If "RS232C", specify a "device name". Specify a host name with up to 15 one-byte coded characters. Specify a device name with a RS232C port name or a device file name. (Example: Windows - COM1, Solaris - /dev/ttya)
-ctl1 device address	Specify the device or address to change, which address is used to connect to Controller 1. Specify in the same way as for Controller 0.
-watch	Specify that an array unit is monitored for errors.
-ignore	Specify that an array unit is not monitored for errors.
-communicationtype nonsecure secure securepriority	Specify the communication type. If omitted this option, non-secure port is used. - nonsecure: Non-secure port - secure: Secure port - securepriority: Secure port When the secure port can not be used, the non-secure port is used.
-f	The confirmation message at command execution is omitted.

Examples

The following example shows the procedure for changing registration information. The user executes the reference command to display the registration information of an array sms100a1, then executes the `auunitchg` command to change the information. After changing the information, the user executes the reference command again to check whether the changes have been made.

```
% auunitref -unit sms100a1
Name                                     Group
Type  Construction Connection Type Error Monitoring Communication Type IP Ad
```

```

dress/Host Name/Device Name
sms100a1
SMS100 Dual TCP/IP(LAN) Enable hsp Non-secure 192.1
68.3.100 192.168.3.102
%
% auunitchg -unit sms100a1 -LAN -ctl0 192.168.1.101
Are you sure you want to update the unit information?
(y/n [n]): y
Unit information is updated.
%
% auunitref -unit sms100a1
Name Group
Type Construction Connection Type Error Monitoring Communication Type IP Address/Host
Name/Device Name
sms100a1 hsp
SMS100 Dual TCP/IP(LAN) Enable Non-secure 192.1
68.3.101 192.168.3.102
%
```

If a specified array is not yet registered, the following message is displayed.

```

% auunitchg -unit 9500b1
DMEA001003: The specified subsystem name is not registered.
%
```

Deleting the registration information

Command name

```
auunitdel
```

Format

```

9500V, AMS, WMS, SMS, AMS2000
auunitdel -unit unit_name ... [ -f ]
```

Description

This command deletes the registration information of a registered array.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_", ".", "@", or " (space)". Space in front and back of the character string is removed.
Single specification	Specifying a single array unit name. Example: -unit ams2000a1
Multiple specification	Specifying multiple array unit names. Example: -unit ams2000a1 ams2000
-f	The confirmation message at command execution is omitted.

Examples

The following example deletes registration information of registered array 9500a1.

```
% auunitdel -unit 9500a1
Are you sure you want to delete the specified subsystem? (y/n [n]): y
The 9500a1 has been deleted.
The subsystems have been deleted successfully.
%
```

The following example checks the information registered about an array that has been deleted.

```
% auunitdel -unit 9500a1
DMEA001003: The specified subsystem name is not registered.
%
```

Displaying array status

This section covers the following commands related to array status:

- [Displaying a firmware revision on page 3-35](#)
- [Displaying drive configuration information on page 3-35](#)
- [Displaying the cache configuration information on page 3-37](#)
- [Displaying the status of power supply/fan/battery/loop/ENC on page 3-39](#)
- [Displaying the status of component parts on page 3-40](#)
- [Referencing the parts options on page 3-47](#)
- [Displaying the current IP address on page 3-48](#)
- [Displaying the information messages on page 3-49](#)
- [Referencing/setting the equipment ID or controller ID on page 3-50](#)
- [Displaying the equipment information on page 3-51](#)

Displaying a firmware revision

Command name

aurev

Format

9500V
aurev -unit unit_name

Description

This command displays the firmware revision of a specified unit.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "- (minus)", "_ (underline)", ". (period)", "@", or " (space)". Space in front and back of the character string is removed.

Example

The following example displays the firmware revision of an array 9500a1.

```
% aurev -unit 9500a1
Serial Number : nnnnnnnn
Firmware Revision : 0650nn (CTL0)
                  0650nn (CTL1)
%
```

Displaying drive configuration information

Command name

audrive

Format

9500V, AMS, WMS, SMS, AMS2000, HUS
audrive -unit unit_name -status [-uno unit_no -hno hdu_no]
audrive -unit unit_name -vender

Description

This command displays the status and type of drives in a specified array.

If a hard disk on which data restoration is in progress is specified, the process of restoring is displayed.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " " (space). Space in front and back of the character string is removed.
-status -vendor	-status: The drive information is displayed. When recovery is in progress, "(nn%)" is displayed to indicate the progress rate of recovery. When no recovery is performed, "(0%)" is displayed. When recovery terminates normally or recovery is terminated forcibly, "(100%)" or "Normal" is displayed. When recovery terminates abnormally, "(nn% Aborted)" is displayed to indicate the progress rate of the recovery already processed until an abnormal termination and the resulting abnormal termination. -vendor: The vendor ID, product ID, the storage capacity of drives, revision of the mounted drive, serial number of drives and drive type are displayed.
-uno <i>unit_no</i>	Specify the unit number of the top drive in a RAID group.
-hno <i>hdu_no</i>	Displays the operating status of the drive at a specified position

Examples

The following example displays the status of drives in an array 9500a1.

```
% audrive -unit 9500a1 -status Unit No. HDU No. Type Physics Status
0 0 Data Mounted Normal
0 1 Data Mounted Normal
:
0 13 Spare Mounted Standby
1 0 Undefined Mounted Out of RG
1 1 Undefined Mounted Out of RG
:
1 14 Undefined Mounted Out of RG
:
%
```

The following example displays the drive information of an array 9500a1.

```
% audrive -unit 9500a1 -vendor
Unit No. HDU No. Vendor Product Revision Capacity Serial No. Type
0 0 HITACHI DK32DJ-72FC K5K5 72GB 30xxxxxx FC
0 1 HITACHI DK32DJ-72FC K5K5 72GB 30xxxxxx FC
:
0 13 HITACHI DK32DJ-72FC K5K5 72GB 30xxxxxx FC:
1 0 HITACHI HDS722525VLSA80 xxxx 250GB C6Cxxxxxx SATA
1 1 HITACHI HDS722525VLSA80 xxxx 250GB C6Cxxxxxx SATA
:
%
```

The following example displays the drive information of an array ams500a1.

```
% audrive -unit ams500a1 -vendor
Unit HDU Capacity Drive Type Vendor ID Product ID Revision Serial No.
0 0 146GB FC SEAGATE DKS2C-J146FC 4Cxx 3Hyxxxxx
0 1 146GB FC SEAGATE DKS2C-J146FC 4Cxx 3Hyxxxxx
:
:
1 0 HITACHI HDS722525VLSA80 xxxx 250GB A60A C6Cxxxxxx SATA
1 1 HITACHI HDS722525VLSA80 xxxx 250GB A60A C6Cxxxxxx SATA

%
```

The following example displays the drive information of an array sms100a1.

```
% audrive -unit sms100a1 -vendor
Unit HDU Capacity Drive Type Rotational Speed Vendor ID Product ID
Revision Serial No.
0 0 146GB SAS 15000rpm HITACHI HUS151414VL
S300 4444 HGST140A
0 1 146GB SAS 15000rpm HITACHI HUS151414VL
S300 4444 HGST140B
:
:

%
```

The following example displays the drive information of an array unit HUS 130.

```
% audrive -unit hus130 -vendor
Unit HDU Capacity Drive Type Rotational Speed Vendor ID Product ID Revision Serial
No.
0 0 600GB SAS(SFF) 10000rpm SEAGATE DKS5C-J600SS 5C00
6WN01SLP
0 1 600GB SAS(SFF) 10000rpm SEAGATE DKS5C-J600SS 5C00
6WN02TK4
:
:

%
```

Displaying the cache configuration information

Command name

```
aucache
```

Format

```
9500V
aucache -unit unit_name
```

Description

This command displays the status and the capacity of cache memory.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.

Example

The following example displays the cache memory configuration information of an array 9500a1:

```
% aucache -unit 9500a1
CTL Slot Status Size(MB)
0 0 Normal 512
0 1 Normal 512
1 0 Normal 512
1 1 Normal 512
%
```

Displaying the status of power supply/fan/battery/loop/ENC

Command name

ausupply

Format

```
9500V
ausupply -unit unit_name
```

Description

This command displays the status of AC power supplies, fans, batteries, battery backup circuits, loop, and ENC. Please use the `auparts` command, when you display the status of Power Supply/Fan/Battery/Loop/ENC to 9500V(9580V)/AMS/WMS/AMS2000/HUS.

Options

Option	Description
<code>-unit <i>unit_name</i></code>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_", ".", "@", or " (space)". Space in front and back of the character string is removed.

Example

This example displays the status of power supplies, batteries, fans, backup circuits, loop, and ENC of an array 9500a1.

```
% ausupply -unit 9500a1
AC PS Information
Unit AC Status
  0 0 Normal
  0 1 Normal
  .
  .
 13 1 Nothing

FAN Information
Unit FAN Status
  0 0 Normal
  0 1 Normal
  .
  .
 13 1 Nothing

Battery Information
No. Status
  0 Normal

Battery Backup Information
No. Status
  0 Normal
  1 Normal

Loop Information
Path Loop Status
  0 0 Normal
  .
  1 1 Normal
```

```

ENC Information
Unit ENC Status
  0  0 Normal
  0  1 Normal
  .
  .
13  1 Nothing
%
```

Displaying the status of component parts

Command name

auparts

Format

```

9500V, AMS, WMS, SMS, AMS2000
auparts -unit unit_name
```

Description

This command displays the status of the controller, cache, AC power supplies, fans, batteries, battery backup circuits, loop, ENC, interface board, host connectors, and unit type. When NNC is connected, the status of the NNC components (NNC, NNC Base, DIMM, PS, fan, Extension Slot and host connector) are also displayed.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " " (space). Space in front and back of the character string is removed.

Examples

This example displays the status of individual parts of an array unit hus150, which installs a DC power supply.

```

% auparts -unit hus150
Controller
CTL Status
  0 Normal
  1 Normal

Cache
CTL Slot Capacity(MB) Status
  0  0      1024 Normal
  0  1      --- Detached
  .
  1  1      8192 Normal

I/F Module
CTL Slot Type Status
  0  A Management Module(LAN) Normal
  0  B Management Module(UPS+Remote) Normal
  0  C I/O Module(Drive) Normal
```

```

0    D I/O Module(Drive)          Normal
0    E I/O Module(Host(Fibre Channel)) Executing(Waiting Remove)
0    F I/O Module(Host(Fibre Channel)) Normal
1    A Management Module(LAN)      Normal
1    B Management Module(UPS)      Normal
1    C I/O Module(Drive)           Normal
1    D I/O Module(Drive)           Normal
1    E I/O Module(Host(Fibre Channel)) Executing(Waiting Remove)
1    F I/O Module(Host(Fibre Channel)) Normal

Battery
Battery Status
0    Normal
1    Normal

Host Connector
Port Status
0A   Normal
0B   Alarm
:
1H   Normal

Fan
Unit Fan Status
CTU   00 Normal
CTU   01 Normal
CTU   02 Normal
CTU   10 Normal
CTU   11 Normal
CTU   12 Normal

DC PS
Unit DC PS Status
0    0 Normal
0    1 Normal
1    0 Normal
1    1 Normal
:
14   1 Normal

ENC
Unit ENC Type Status
0    0 ENC(SAS/SFF/xFF/CBx) Normal
0    1 ENC(SAS/SFF/xFF/CBx) Normal
1    0 ENC(CBx) Normal
1    1 ENC(xFF) Normal
:    : :
:    : :

Unit
Unit Type Serial Number
CTU Standard 00000000
0 StandardS 11111111
1 StandardL 22222222
2 Dense(0-A) 33333333
3 Dense(0-B) 33333333
:    : :

Air Filter
Status
Normal

%
```

This example displays the status of controller, cache, AC power supplies, fans, batteries, battery backup circuits, loop, and ENC of a 9500h array.

```

% auparts -unit 9500h
Controller Information
CTL Status
0 Normal
1 Normal

Cache Information
CTL Slot Status Size(MB)
0 0 Normal 1024
:
```

```

AC PS Information
Unit AC Status
CTU 0 Normal
CTU 1 Normal
0 0 Normal
0 1 Normal
:

FAN Information
Unit FAN Status
CTU 0 Normal
CTU 1 Normal
0 0 Normal
0 1 Normal
:

Battery Information
No. Status
0 Normal
1 Normal

Battery Backup Information
No. Status
0 Normal
1 Normal

Loop Information
Path Loop Status
0 0 Normal
0 1 Normal
:

ENC Information
Unit ENC Type Status
0 0 SENC Normal
0 1 SENC Normal
:

Unit Information
Unit Type
0 FC
1 AT
:

%

```

This example displays the status of controller, cache, AC power supplies, fans, batteries, battery backup circuits, loop, ENC, and NNC type1 components of an array ams500 individually.

```

% auparts -unit ams500
Controller
CTL Status
0 Normal
1 Normal

Cache
CTL Slot Capacity(MB) Status
0 0 1024 Normal
0 1 --- Nothing
1 0 1024 Normal
1 1 --- Nothing

Battery Backup
CTL Status
0 Normal
1 Normal

Battery
Battery Status
0 Normal
1 Normal

Fan
Unit Fan Status
0 0 Normal
0 1 Normal

AC

```

```

Unit AC Status
  0 0 Normal
  0 1 Normal

ENC
Unit ENC Type Status

Loop
Path Loop Status
  0 0 Normal
  0 1 Normal
  1 0 Normal
  1 1 Normal

Unit
Unit Type
  0 FC

NNC
NNC Status
  0 Normal
  2 Normal

```

```

NNC0                                Status
DIMM
  B0                                Normal
  A0                                Normal
  B1                                Normal
  A1                                Normal
PS                                  Normal
Fan                                 Normal
Host Connector                      Normal

NNC2                                Status
DIMM
  B0                                Normal
  A0                                Normal
  B1                                Normal
  A1                                Normal
PS                                  Normal
Fan                                 Normal
Host Connector                      Normal

%

```

This example displays the status of controller, cache, AC power supplies, fans, batteries, battery backup circuits, loop, ENC, and NNC type2 components of an array ams500m.

```

% auparts -unit ams500m
Controller
CTL Status
  0 Normal
  1 Normal

Cache
CTL Slot Capacity(MB) Status
  0 0 1024 Normal
  0 1 --- Nothing
  1 0 1024 Normal
  1 1 --- Nothing

Battery Backup
CTL Status
  0 Normal
  1 Normal

Battery
Battery Status
  0 Normal
  1 Normal

Fan
Unit Fan Status
  0 0 Normal
  0 1 Normal

```

```

AC
Unit AC Status
0 0 Normal
0 1 Normal

ENC
Unit ENC Type Status

Loop
Path Loop Status
0 0 Normal
0 1 Normal
1 0 Normal
1 1 Normal

Unit
Unit Type
0 FC

NNC
NNC Status
0 Normal
2 Normal

NNC0 Status
NNC Base Normal
DIMM
A0 Normal
B0 Normal
C0 Normal
D0 Normal
PS
0 Normal
Fan
0 Normal
1 Normal
2 Normal

Extension Slot
3 Normal

NNC2 Status
NNC Base Normal
DIMM
A0 Normal
B0 Normal
C0 Normal
D0 Normal
PS
0 Normal
1 Normal
Fan
0 Normal
1 Normal
2 Normal

Extension Slot
3 Normal

Extension Card
NNC Extension Slot Extension Card Status
0 3 PCI-Express Card Normal
2 3 PCI-Express Card Normal

```

This example displays the status of an array sms100.

```

% auparts -unit sms100
Original Array
Status : Warning
Repair Slot 1 : Empty
Repair Slot 2 : Empty
%

```

This example displays the status of an array ams2300m.

```
% auparts -unit ams2300m
Controller
CTL  Status
0   Normal
1   Normal

Cache
CTL  Slot  Capacity(MB)  Status
0    0      2048      Normal
0    1      2048      Normal
1    0      2048      Normal
1    1      2048      Normal

Interface Board
CTL  Interface Board Type      Status
0    0      0 Fibre Channel Normal
1    0      0 Fibre Channel Normal

Battery
Battery Status
0   Normal

Additional Battery
Battery Status

Host Connector
Port Status
0A Normal
0B Normal
0C Normal
0A Normal
1A Normal
1B Normal
1C Normal
1D Normal

Fan
Unit  Fan  Status

AC
Unit AC  Status
0 0 Normal
0 1 Normal
1 0 Normal
1 1 Normal

ENC
Unit ENC Type Status
1 0 ENC Normal
1 1 ENC Normal

Unit
Unit Type      Serial Number
0 Standard 85010053
1 Standard 00000101
```

This example displays the status of an array ams2500h.

```
% auparts -unit ams2500h
Controller
CTL Status
0 Normal
1 Normal

Cache
CTL Slot Capacity(MB) Status
0 0 4096 Normal
0 1 2048 Normal
0 2 2048 Normal
0 3 2048 Normal
1 0 4096 Normal
1 1 2048 Normal
1 2 2048 Normal
1 3 2048 Normal

Interface Board
CTL Interface Board Type Status
0 0 Fibre Channel Normal
0 1 Fibre Channel Normal
1 0 Fibre Channel Normal
1 1 Fibre Channel Normal

Battery
Battery Status
0 Normal
1 Normal
2 Normal
3 Normal

Additional Battery
Battery Status
0 Normal
1 Normal

Host Connector
Port Status
0A Normal
0B Normal
:
:
1A Normal
1B Normal
:
:

Fan
Unit Fan Status
CTU 0 Normal
CTU 1 Normal
CTU 2 Normal
CTU 3 Normal
0 0 Normal
0 1 Normal
:
:

AC
Unit AC Status
CTU 0 Normal
CTU 1 Normal
0 0 Normal
0 1 Normal
:
:

ENC
Unit ENC Type Status
1 0 ENC Normal
1 1 ENC Normal
:
:

Unit
Unit Type Serial Number
CTU --- 87000045
0 Standard 00000101
1 Standard 00000102
```

```

:
:
4 Dense(0-A) 00000401
5 Dense(0-B) 00000501
:
:
%
```

This example displays the status of parts of an array unit HUS 130 individually.

```

% auparts -unit HUS130
Controller
CTL Status
0 Normal
1 Normal

Cache
CTL Slot Capacity(MB) Status
0 0 4096 Normal
1 0 4096 Normal

Interface Board
CTL Interface Board Type Status
0 0 Fibre Channel Normal
1 0 Fibre Channel Normal

Battery
Battery Status
0 Normal
1 Normal

Host Connector
Port Status
0A Normal
0B Normal
:

Fan
Unit Fan Status
0 0 Normal
0 1 Normal
:

AC PS
Unit AC PS Status
0 0 Normal
0 1 Normal
:

ENC
Unit ENC Type Status
0 0 ENC Normal
0 1 ENC Normal
:

Unit
Unit Type Serial Number
0 StandardS 90000026
1 StandardS 00000101
```

Referencing the parts options

Command name

aupartsopt

Format

```

AMS2000, HUS 100
auparts -unit unit_name -refer
```

Description

This command references the parts options.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " (space)". Space in front and back of the character string is removed.
-refer	References the parts options.

Example

The following example displays the parts options of an array ams2300.

```
% aupartsopt -unit ams2300 -refer
Air Filters
  Air Filter Timer      : Disable
  Expiration Time(hours) : 8800
  Running Time(hours)   : 100
%
```

Displaying the current IP address

Command name

aucr1an

Format

```
9500V
  aucr1an -unit unit_name
```

Description

This command displays the enabled LAN information of the array.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " (space)". Space in front and back of the character string is removed.

The following example displays the enabled LAN information of an array 9500a1.

```
% aucrlan -unit 9500a1
CTL IP Address Subnet Mask Default Gateway
0 125.0.9.98 255.255.255.0 125.0.9.5
1 125.0.9.99 255.255.255.0 125.0.9.5
%
```

Displaying the information messages

Command name

auinfomsg

Format

```
9500V, AMS, WMS, SMS, AMS2000, HUS
auinfomsg -unit unit_name
```

Description

This command displays the Information Messages of the specified array.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " (space)". Space in front and back of the character string is removed.

Example

The following example obtains and displays the information messages on an array 9500a1.

```
% auinfomsg -unit 9500a1
Controller 0/1 Common
06/27/2001 21:18:37 C0 I12203 LU format completed(LU-03)
06/27/2001 21:18:36 C0 I12204 LU format completed(LU-04)
06/27/2001 21:18:36 C0 I12201 LU format completed(LU-01)
06/27/2001 21:18:35 C0 I12202 LU format completed(LU-02)
06/27/2001 21:18:37 C0 I12200 LU format completed(LU-00)
06/27/2001 21:17:34 C0 I12404 LU format start(LU-00)
06/27/2001 21:17:34 C0 I12403 LU format start(LU-03)
06/27/2001 21:17:33 C0 I12402 LU format start(LU-02)
06/27/2001 21:17:33 C0 I12401 LU format start(LU-01)
06/27/2001 21:17:33 C0 I12400 LU format start(LU-00)
06/27/2001 21:15:30 C0 I11000 All RAID group initialized
06/27/2001 21:13:17 C0 I12100 LU deleted(LU-00)
06/27/2001 21:12:57 C0 I12100 LU deleted(LU-00)
06/27/2001 21:12:16 C0 I12100 LU deleted(LU-00)
06/27/2001 21:11:20 C0 I12100 LU deleted(LU-00)
06/27/2001 21:10:45 C0 I12100 LU deleted(LU-00)
06/27/2001 21:10:04 C0 I12100 LU deleted(LU-00)
06/27/2001 21:06:02 C0 I10000 Subsystem is ready

Controller 0
06/27/2001 21:03:55 C0 RBE301 Flash program update end
06/27/2001 21:03:55 C0 RBE300 Flash program update start

Controller 1
%
    ↖
    When there is no information, only the header will be displayed.
```

Referencing/setting the equipment ID or controller ID

Command name

auunitid

Format

```
9500V
auunitid -unit unit_name -refer
auunitid -unit unit_name -set
[ -EquipmentID string ]
[ -ControllerIDFlag ctl_no enable | disable ]
[ -ControllerID ctl_no string ]
```

Description

This command references or sets the equipment or controller ID.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and back of the character string is removed.
-refer	References the equipment ID or the controller ID.
-set	Sets the equipment ID or the controller ID.
-EquipmentID <i>string</i>	Sets the equipment ID. <i>string</i> : The equipment ID (up to four numerals)
-ControllerIDFlag <i>ctl_no</i> enable disable	Specify whether to set the controller ID flag effective or ineffective. <i>ctl_no</i> : Controller number (0, 1) - enable : Enables the controller ID. - disable: Disables the controller ID.
-ControllerID <i>ctl_no string</i>	Specify the controller ID. <i>ctl_no</i>: Controller number (0, 1) <i>string</i>: Controller ID (up to eight characters). If you want to enter NULL characters, enter "".

Example

The following example displays the controller ID flag and controller ID of an array 9500a1.

```
% auunitid -unit 9500a1 -refer
Password:
Equipment ID
  nnnn
CTL0
  ControllerIdentifier = disable(DF600-00 C0)
CTL1
  ControllerIdentifier = disable(DF600-00 C1)
%
```

Displaying the equipment information

Command name

auunitinfo

Format

```
AMS, WMS, SMS, AMS2000, HUS
auunitinfo -unit unit_name
```

Description

This command displays the equipment type, serial number, firmware revision, and LAN information of the array.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.

Examples

The following example displays the equipment information of an array ams500a1.

```
% auunitinfo -unit ams500a1
Array Unit Type   : AMS500
Construction      : Dual
Serial Number     : 75010026
Firmware Revision : 0771/A-M
CTL IP Address    Subnet Mask    Default Gateway
0 192.168.0.1     255.255.255.0    192.168.0.100
1 192.168.0.2     255.255.255.0    192.168.0.100
%
```

The following example displays the equipment information of an array sms100.

```
% auunitinfo -unit sms100
Array Unit Type   : 0100
Construction      : Dual
Serial Number     : 81012345
Array ID          : 81012345
Firmware Revision(CTL0) : 1860/A-A
Firmware Revision(CTL1) : 1860/A-A
CTL0
IPv4
IPv4 Address      : 172.16.11.230
IPv4 Subnet Mask   : 255.255.255.0
IPv4 Default Gateway : 172.16.11.1
IPv6
IPv6 Address      : fe80::200:87ff:fec6:46e7
Subnet Prefix Length : 64
IPv6 Default Gateway : fe80::20
CTL1
IPv4
IPv4 Address      : 172.16.11.231
IPv4 Subnet Mask   : 255.255.255.0
IPv4 Default Gateway : 172.16.11.1
IPv6
IPv6 Address      : fe80::200:87ff:fec6:46e9
Subnet Prefix Length : 64
IPv6 Default Gateway : fe80::20
%
```

RAID/volume commands

This section covers the following commands related to RAID groups and logical units:

- [Referencing a RAID Group on page 3-54](#)
- [Setting up a RAID Group on page 3-56](#)
- [Expanding a RAID Group on page 3-59](#)
- [Deleting the RAID Group on page 3-61](#)
- [Referencing a volume on page 3-63](#)
- [Setting up a volume on page 3-65](#)
- [Formatting the volume on page 3-70](#)
- [Displaying the progress of volume formatting on page 3-72](#)
- [Referencing/setting the quick format option on page 3-73](#)
- [Expanding a volume on page 3-75](#)
- [Deleting the volume on page 3-76](#)
- [Changing the default controller of a volume on page 3-78](#)
- [Referencing the unified volume on page 3-79](#)
- [Unifying volumes on page 3-79](#)
- [Separating volumes on page 3-80](#)
- [Invalidating a volume on page 3-81](#)
- [Reassigning a volume on page 3-82](#)
- [Restoring a volume on page 3-83](#)
- [Referencing/starting/skipping/canceling parity correction online on page 3-84](#)
- [Referencing/setting the mapping guard information on page 3-87](#)
- [Referencing/setting volume cache partition on page 3-89](#)
- [Changing the volume size on page 3-90](#)

Referencing a RAID Group

Command name

aurgref

Format

```
9500
aurgref -unit unit_name [-m | -g]

AMS, WMS
aurgref -unit unit_name [-m | -g] [-detail rg_no]

SMS, AMS2000, HUS
aurgref -unit unit_name [-m | -g | -t | -auto] [-detail rg_no]
```

Description

This command displays a list of definition of the RAID groups set to the array.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-m	Specify the RAID groups in MBytes.
-g	Specify the RAID groups in GBytes.
-t	Specify the RAID groups in TBytes.
-auto	If the capacity is 1 TByte or more, it is displayed in TByte. If 1 GB or more and less than 1 TB, it is displayed in GByte. If less than 1 GByte, it is displayed in GByte.
-detail <i>rg_no</i>	Specify the RAID group number to be detail displayed.

Examples

The following example displays the definition of the RAID group of an array 9500a1.

```
% aurgref -unit 9500a1 -g
RAID  RAID  Start Location  Number of HDU  Number of  Free Capacity
Group Level [Unit No. HDU No.] in parity group parity group  [Gbyte] Type
0  5  0  5  5  1  214.6 FC
%
```

The following example displays the definition of the RAID group of an array ams500a1.

```
% aurgref -unit ams500a1 -g
RAID  RAID  Parity  Total Capacity  Free Capacity
Group Level Groups Type  [Gbyte]  [Gbyte]
7  5( 3D+1P)  1 FC  400.3  400.3(100.0%)
```

```

10 0(4D) 1 FC 533.8 533.8(100.0%)
20 1+0(2D+2D) 1 AT 457.7 457.7(100.0%)
%
```

The following example displays the definition of the RAID group of an array unit hus150a1.

```

% aurgref -unit hus150a1 -auto
RAID RAID Parity Rotational
Group LevelGroups Type Speed Total Capacity Free Capacity
0 5(4D+1P)1 SAS 10000rpm 2097.2 TB 786.4 TB(37.5%)
2 1(1D+1D)1 SAS 15000rpm 100 TB 0.0 MB(0.0%)

Priority Status Reconstruction Progress
RAID GroupExp Expanding(10%) 38(Reconst(HDU:2, LU:1))
Host Access Wait Exp(1)(24%)N/A
%
```

The following example displays in detail the definition of the RAID group 7 of an array ams500a1.

```

% aurgref -unit ams500a1 -g -detail 7
RAID Group : 7
RAID Level : 5(3D+1P)
Parity Groups : 1
Type : FC
Total Capacity : 400.3 Gbyte
Free Capacity : 400.3 Gbyte (100.0%)
Drive Configuration
Parity Group Unit HDU Capacity
0 0 0 146GB
0 0 1 146GB
0 0 2 146GB
0 0 3 146GB
Assignment Information
No. Capacity[Gbyte] Assignment Status
0 0.0 LUN0
1 0.0 LUN1
2 0.0 LUN2
3 0.0 LUN3
4 0.0 LUN4
5 400.3 Free
%
```

The following example displays the definition of the RAID group of an array sms100.

```

% aurgref -unit sms100 -t
RAID RAID Parity
Group Level Groups Type Total Capacity Free Capacity
Priority Status Reconstruction Progress
0 6(9D+2P) 1 SAS 1.3 TB 1.3 TB (100.0%)
) Host Access Normal
%
```

The following example displays in detail the definition of the RAID group 1 of an array ams2300a1.

```

% aurgref -unit ams2300a1 -g -detail 1
RAID Group : 1
RAID Level : 5(3D+1P)
Parity Groups : 1
Type : SAS
Total Capacity : 400.3 GB
Free Capacity : 400.3 GB (100.0%)
Priority : RAID Group Expansion
Status : Waiting Expansion(75)(94%)
Reconstruction Progress : N/A
Defined LU Count : 10
Drive Configuration
Parity Group Unit HDU Capacity
0 0 0 146GB
0 0 1 146GB
0 0 2 146GB
```

```

0 0 3 146GB
Assignment Information
No. Capacity Assignment Status
5 400.3 GB Free
%
```

The following example displays in detail the definition of the RAID group 1 of an array unit hus150a1.

```

% aurgref -unit hus150a1 -detail 1
RAID Group : 1
RAID Level      : 5(4D+1P)
Parity Groups   : 1
Type            : SAS
Rotational Speed : Mixed
Total Capacity  : 268435456 blocks
Free Capacity   : 268435456 blocks (100.0%)
Priority         : RAID Group Expansion
Status          : Regression/Waiting expansion(1)(2%)
Reconstruction Progress : 38%(Reconstruction(HDU:2, LU:1))
Defined LU Count : 2
Drive Configuration

Parity Group Unit HDU Capacity Rotational
              0 0 7 600GB 10000rpm
              0 0 8 600GB 10000rpm
              0 0 9 600GB 10000rpm
              0 0 10 600GB 15000rpm
              0 0 11 600GB 15000rpm
Assignment Information
No. Capacity Assignment Status
2 274877906944 blocks Free
%
```

Setting up a RAID Group



CAUTION! Creating RAID groups on the Simple Modular Storage 100 system invalidates your Hitachi warranty and support. Please consult your reseller before using the CLI.

Command name

aurgadd

Format

```

9500V
aurgadd -unit unit_name -rg rg_no
        -RAID0 | -RAID1 | -RAID5 | -RAID10
        -uno unit_no -hno hdu_no -hnum hdu_num -pnum pty_num

AMS, WMS
aurgadd -unit unit_name -rg rg_no
        -RAID0 | -RAID1 | -RAID5 | -RAID10 | -RAID6
        -drive auto
        -hnum hdu_num
        -pnum pty_num
        -drvcapa 36 | 72 | 146 | 250 | 300 | 400 | 500 | 750 | 1000

aurgadd -unit unit_name -rg rg_no
        -RAID0 | -RAID1 | -RAID5 | -RAID10 | -RAID6
        -drive unit_no.hdu_no ...
        -pnum pty_num

aurgadd -unit unit_name -availablelist -type FC | SATA

AMS2000
aurgadd -unit unit_name -rg rg_no
        -RAID0 | -RAID1 | -RAID5 | -RAID10 | -RAID6
```

```

-drive auto
-hnum hdu_num
-pnum pty_num
-drvcapa 100 | 146 | 200 | 300 | 400 | 450 | 500 | 600 | 750 | 1000 |
2000 | 3000
-type SAS | SSD | SAS7K | SAS_SED | SAS_SFF

aurgadd -unit unit_name -rg rg_no
-RAID0 | -RAID1 | -RAID5 | -RAID10 | -RAID6
-drive unit_no.hdu_no ...
-pnum pty_num

aurgadd -unit unit_name -availablelist -type SAS | SSD | SAS7K |
SAS_SED | SAS_SFF
[ -drvcapa 100 | 146 | 200 | 300 | 400 | 450 | 500 | 600 | 750 | 1000 |
2000 | 3000 ]

HUS100
aurgadd -unit unit_name -rg rg_no
-RAID0 | -RAID1 | -RAID5 | -RAID10 | -RAID6
-drive auto
-hnum hdu_num
-pnum pty_num
-drvcapa 200 | 300 | 400 | 600 | 800 | 900 | 1200 | 2000 | 3000 | 4000
-type SAS | SAS:10K | SAS:15K | SAS7K | SSD

aurgadd -unit unit_name -rg rg_no
-RAID0 | -RAID1 | -RAID5 | -RAID10 | -RAID6
-drive unit_no.hdu_no ...
-pnum pty_num

aurgadd -unit unit_name -availablelist
-type SAS | SAS:10K | SAS:15K | SAS7K | SSD
[ -drvcapa 200 | 300 | 400 | 600 | 800 | 900 | 1200 | 2000 | 3000 | 4000 ]

```

Description

This command sets up a RAID in a specified array.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-rg <i>rg_no</i>	Specify the RAID group number.
-RAID0 -RAID1 -RAID5 -RAID10 -RAID6	Specify the RAID level.
-hnum <i>hdu_num</i>	Specify the number of HDUs in the parity group of the RAID group.
-pnum <i>pty_num</i>	Specify the number of parity groups of the RAID group.
-uno <i>unit_no</i>	Specify the Unit number of the top drive in a RAID group.
-drive auto <i>unit_no.hdu_no ...</i>	Specify the drives that compose the RAID group. • auto: The Unit number and HDU numbers are set automatically. • unit_no.hdu_no: Specify the Unit number and HDU number punctuating them with a period. When doing that, enter the Unit number and HDU number using numerals or hyphen(s) (-). • Example: -drive 0.1 2.3 3.1 • Example: -drive 1.0-2.2 2.8
-type FC SATA -type SAS SATA SSD SAS7K SAS10K SAS15K SAD_SED SAS_SFF	• When setting the RAID group: • Specify the drives type that compose the RAID group. • Specify this option only when setting the drives automatically. • When a list of the usable drives is displayed: Specify the drives type to be displayed in the list of the usable drives.
-drvcapa 36 72 146 250 300 400 450 500 750 1000	Specify the drive capacity that compose the RAID group. Specify this option only when setting the drives automatically.
-availablelist	The drives list in which the RAID group can be set is displayed.

Examples

The following example sets up a RAID of an array ams500a1. Set a RAID number to 10, RAID level to RAID 5, number of hard disk units (HDUs) in the parity group to 5, number of parity groups to 1, drive capacity to 146 GB, drive type to FC, and drive selection to auto.

```
% aurgadd -unit ams500a1 -rg 10 -RAID5 -hnum 5 -pnum 1 -drvcapa 146 -type FC
-drive auto
Password:
The drive will be selected automatically.
Are you sure you want to add a RAID group? (y/n [n]): y
The RAID Group has been set successfully.
%
```

The following example sets up a RAID group of an array ams500a1. Set a RAID group number to 11, RAID level to RAID 5, number of parity groups to 1, and drive type to FC. The drive to be used displays the drive list that can be used.

```
% aurgadd -unit ams500a1 -availablelist -type FC
Password:
Available Drives
Drive Type : FC
Unit HDU Capacity
0 7 146GB
0 8 146GB
0 9 146GB
1 0 146GB
1 1 146GB
1 2 146GB
1 3 146GB
1 4 146GB
%
% aurgadd -unit ams500a1 -rg 11 -RAID5 -pnum 1 -drive 0.7 0.8 0.9
Password:
Are you sure you want to add a RAID group? (y/n [n]): y
The RAID Group has been set successfully.
%
```

The following example sets up a RAID group of an array unit hus150a1. Set a RAID group number to **10**, RAID level to **RAID 5**, number of HDUs in the parity group to **5**, number of parity groups to **1**, drive capacity to **600 GB**, drive type to **SAS**, drive rotational speed to **1,0000**, and drive selection to **auto**.

```
% aurgadd -unit hus150a1 -rg 10 -RAID5 -drive auto -hnum 5 -pnum 1 -drvcapa 600
-type SAS:10K
The drive will be selected automatically.
Are you sure you want to set a RAID group? [y/n [n]: y
The RAID Group has been set successfully.
```

Expanding a RAID Group

Command name

aurgexp

Format

```
9500V
aurgexp -unit unit_name -rg rg_no -pnum pty_num
AMS2000, HUS
aurgexp -unit unit_name -rg rg_no -drive unit_no.hdu_no ...
aurgexp -unit unit_name -chg -priority host | expansion
aurgexp -unit unit_name -cancel -rg rg_no
aurgexp -unit unit_name -availablelist -rg rg_no
```

Description

This command expands the defined size of a RAID.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ".", "(period)", "@", or " (space)". Space in front and back of the character string is removed.
-rg <i>rg_no</i>	Specify the RAID group number of a RAID group which is to be expanded.
-pnum <i>pty_num</i>	Specify the number of parity groups after expansion.
-drive <i>unit_no.hdu_no ...</i>	Specify the Unit number and HDU number punctuating them with a period to be expanded. Single or multiple drive numbers can be specified. <i>unit_no</i>: Unit number <i>hdu_no</i>: HDU number - Single specification: Specifying a single drive number. Example: -drive 1.0 - Multiple specification: Specifying multiple drives numbers. Example: -drive 1.0 2.3 3.1 -drive 1.0-2.2 2.8
-chg	Changes the priority of RAID group expansion.
-cancel	Cancels the RAID group expansion.
-availablelist	A list of drives, each of which is eligible for a expanding HDU is displayed.
-priority host expansion	Specify the priority. The default value is Host access. - host : Host access - expansion : RAID group expansion

Examples

The following example expands the number of parity groups of RAID 0 (from 1 to 3), whose number has been set in an array 9500a1.

```
% aurgref -unit 9500a1
RAID RAID Start Location Number of HDU Number of Free Capacity
Group Level [Unit No. HDU No.] in parity group parity group [block]
0 5 0 5 5 1 10000000
%
% aurgexp -unit 9500a1 -rg 0 -pnum 3
Password:
%
% aurgref -unit 9500a1
RAID RAID Start Location Number of HDU Number of Free Capacity
Group Level [Unit No. HDU No.] in parity group parity group [block]
0 5 0 5 5 3 30000000
%
```

The following example expands the RAID group 1 adding two drives which number has been set in an array ams2300a1. The drive to be used displays the drive list that can be used and chooses it from them.

```
% aurgexp -unit ams2300a1 -availablelist -rg 1
Available Drives
Unit HDU Capacity Drive Type Rotational Speed Status
1 12 146GB SAS 15000rpm Out of RG
1 13 146GB SAS 15000rpm Out of RG
%
% aurgexp -unit ams2300a1 -rg 1 -drive 1.12 1.13
Are you sure you want to expand the RAID group?
(y/n [n]): y
The capacity of the expanded RAID group will be 876.0GB.
Are you sure you want to expand the RAID group? (y/n [n]): y
The host access will be decreased while expanding the RAID group.

Are you sure you want to expand the RAID group? (y/n [n]): y
The RAID group expanding has been started.
%
```

The following example changes the priority mode to an array unit ams2300a1.

```
% aurgexp -unit ams2300a1 -chg -priority expansion
Are you sure you want to change the priority of the RAID group expansion?
[(y/n [n]): y
If you change the priority to the RAID group expansion, the host access will be decreased.

The access processing performance from the host deteriorates while changing the
RAID group expansion.
Are you sure you want to change the priority of the RAID group expansion? (y/n [
n]): y
The priority of the RAID group expansion has been changed successfully.
%
```

Deleting the RAID Group



CAUTION! Deleting RAID groups on the Simple Modular Storage 100 system invalidates your Hitachi warranty and support. Please consult your reseller before using the CLI.

Command name

aurgdel

Format

```
9500V
aurgdel -unit unit_name -rg rg_no [-f]

AMS, WMS, AMS2000, HUS
aurgdel -unit unit_name -rg rg_no ... [-f]

9500V, AMS, WMS, AMS2000, HUS
aurgdel -unit unit_name -ALL [-f]
```

Description

This command deletes the specified RAID group or deletes all RAID groups in an array.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " " (space). Space in front and back of the character string is removed.
-rg <i>rg_no</i> ...	Specify the RAID group number of a RAID group which is to be deleted. For AMS, WMS, SMS and AMS2000, multiple RAID group number can be specified. The RAID groups are deleted in order that you specify them.
-ALL	Deletes all RAID groups.
-f	Omits the confirmation message when the command is executed.

Example

The following shows an example of deleting RAID groups 1, 2, and 5 that are defined in an array ams500a1.

```
% aurgdel -unit ams500a1 -rg 1 2 5
Password:
The specified RAID group(s) will be deleted.
Logical units exit in the RAID group. This operation will destroy RAID groups,
logical units, and the data in those logical units.
Are you sure you want to delete the RAID group(s)? (y/n [n]): y
If you delete the RAID groups, logical units will be deleted. You will not be
able to recover your data. Please make sure to perform backup of all important
data before this RAID group delete operation.
When you delete your RAID group, the data becomes unusable. Systems or
applications that use this subsystem will terminate abnormally. Please make sure
to stop host access to the subsystem before performing this RAID group delete
operation. Are you sure you want to delete the RAID group(s)? (y/n [n]): y
The specified RAID group(s) will be deleted.
Are you sure you want to execute? (y/n [n]): y
The RAID group 1 has been deleted.
The RAID group 2 has been deleted.
The RAID group 5 has been deleted.
The RAID group(s) have been deleted successfully.
%
```

Referencing a volume

Command name

auluref

Format

```
9500V
auluref -unit unit_name [ -m | -g ] [ -last | -lu lun ... ]

AMS, WMS
auluref -unit unit_name [ -m | -g ] [ -lu lun ... ]

SMS, AMS2000, HUS
When referencing LU information
auluref -unit unit_name [ -m | -g ] [ -lu lun ... ]
[ -nosublu ] [ -totalsize ]
When referencing path information of LU
auluref -unit unit_name -pathinfo [ -lu lun ... ]
```

Description

This command displays already-defined LU information (capacity, RAID group No. of a RAID group or DP pool No. to which it belongs, its RAID level, status, and number of paths).

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-m	Specify the volume in MBytes.
-g	Specify the volume in GBytes.
-t	Specify the volume in TBytes.
-auto	If the capacity is 1 TByte or more, it is displayed in TByte. If 1 GB or more and less than 1 TB, it is displayed in GByte. If less than 1 GByte, it is displayed in GByte.
-last	References the last defined LU.
-lu <i>lun ...</i>	Specify an LU number to reference the LU information. If omitted, all LU information that is already defined will be displayed. Single or multiple LU numbers can be specified. - Single specification: Specifying a single LU number. Example: -lu 3 - Multiple specification: Specifying multiple LU numbers. Example: -lu 0 1 2 3 4 5 8 -lu 0-5 8

Examples

The following example displays information about logical unit 0 in an array 9500a1.

```
% auluref -unit 9500a1 -lu 0 -m
Capacity RAID RAID
LU [Mbyte] C-CTL D-CTL Group Level Type Status
0 35.0 0 0 0 5 FC Normal
%
```

The following example displays information about all logical units in an array ams500a1.

```
% auluref -unit ams500a1 -m
Capacity RAID RAID
LU [Mbyte] C-CTL D-CTL Group Level Type Status
0 35.0 0 0 0 5(3D+1P) FC Normal
1 35.0 0 0 1 5(3D+1P) FC Normal
%
```

The following example displays information about all logical units in an array sms100a1.

```
% auluref -unit sms100a1 -m
Stripe RAID DP RAID
LU Capacity Size Group Pool Level Type Status
0 31.9 MB 256KB 0 N/A 6(9D+2P) SAS Normal
1 31.9 MB 256KB 0 N/A 6(9D+2P) SAS Normal
%
```

The following example displays information about all logical units in an array ams2300a1.

```
% auloref -unit ams2300a1 -g
Stripe RAID DP RAID
LU Capacity Size Group Pool Level Type of Paths Status
0 100.0MB 256KB 0 N/A 6(9D+2P) SAS 1 Normal
1 100.0MB 256KB 0 N/A 6(9D+2P) SAS 0 Normal
%
```

The following example displays information about all logical units in an array ams2300a1.

```
% auloref -unit ams2300a -pathinfo -lu 0
LUN : 0
Paths : 1
H-LUN Port Host GROUP/iSCSI Target Port Type
0 0E 001:T001 iscsi
%
```

The following example displays details about path information of LU 0 in an array unit hus150a1.

```
% auloref -unit hus150a1 -g
LU Capacity Stripe RAID DP Tier RAID Rotational Number
0 10.0 GB 256KB 0 N/A N/A 5(2D+1P) SAS 10000rpm 0 Status
Normal
%
```

Setting up a volume

Command name

au luadd

Format

```
9500V
Dual System
    auludd -unit unit_name [ -lu lun ] -rg rg_no -size num[ m | g ] | rest
    -ctl0 | -ctl1
Single System
    auludd -unit unit_name [ -lu lun ] -rg rg_no -size num[ m | g ] | rest

AMS, WMS
Dual System
    auludd -unit unit_name [ -lu lun ] -rg rg_no -size num[ m | g ] | rest
    -ctl0 | -ctl1
    [ -stripesize 64 | 256 | 512 ]
    [ -cachept pt_no ]
    [ -paircachept pt_no | auto ]
    [ -createarea area_no ]
Single System
    auludd -unit unit_name [ -lu lun ] -rg rg_no -size num[ m | g ] | rest
    [ -stripesize 64 | 256 | 512 ]
    [ -cachept pt_no ]
    [ -createarea area_no ]

SMS
When the area is selected automatically.
When creating the logical unit in the maximum free area.
    auludd -unit unit_name
    [ -lu lun ] -rg rg_no -size num[ m | g | t ] | rest
    [ -stripesize 64 | 256 | 512 ]
    [ -noluformat ]

When creating the logical unit using the free area in ascending order.
    auludd -unit unit_name -head
    [ -lu lun ] -rg rg_no -size num[ m | g | t ]
    [ -stripesize 64 | 256 | 512 ]
    [ -arealu lun ]
    [ -noluformat ]
```

When creating the logical unit in the first free area.

```
au luadd -unit unit_name -head
[ -lu lun ] -rg rg_no -size rest
[ -stripesize 64 | 256 | 512 ]
[ -nolufORMAT ]
```

When the area is selected manually.

When creating the logical unit in one free area.

```
au luadd -unit unit_name
[ -lu lun ] -rg rg_no -size num[ m | g | t ] | rest
[ -stripesize 64 | 256 | 512 ]
-crearea area_no
[ -nolufORMAT ]
```

When creating the logical unit in two or more free areas.

```
au luadd -unit unit_name
[ -lu lun ] -rg rg_no -size num[ m | g | t ]
[ -stripesize 64 | 256 | 512 ]
-crearea area_no ...
[ -arealu lun ]
[ -nolufORMAT ]
```

When creating the logical unit using all free areas of RAID Group.

```
au luadd -unit unit_name
[ -lu lun ] -rg rg_no -size rgest
[ -stripesize 64 | 256 | 512 ]
[ -arealu lun ]
[ -nolufORMAT ]
```

AMS2000, HUS

When the area is selected automatically.

When creating the logical unit in the maximum free area.

```
au luadd -unit unit_name
[ -lu lun ] -rg rg_no
-size num[ m | g | t ] | rest
[ -stripesize 64 | 256 | 512 ]
[ -cachept pt_no ]
[ -paircachept pt_no | auto ]
[ -nolufORMAT ]
```

When creating the logical unit using the free area in ascending order.

```
au luadd -unit unit_name -head
[ -lu lun ] -rg rg_no -size num[ m | g | t ]
[ -stripesize 64 | 256 | 512 ]
[ -cachept pt_no ]
[ -paircachept pt_no | auto ]
[ -arealu lun ]
[ -nolufORMAT ]
```

When creating the logical unit in the first free area.

```
au luadd -unit unit_name -head
[ -lu lun ] -rg rg_no -size rest
[ -stripesize 64 | 256 | 512 ]
[ -cachept pt_no ]
[ -paircachept pt_no | auto ]
[ -nolufORMAT ]
```

When the area is selected manually.

When creating the logical unit in one free area.

```
au luadd -unit unit_name
[ -lu lun ] -rg rg_no -size num[ m | g | t ] | rest
[ -stripesize 64 | 256 | 512 ]
[ -cachept pt_no ]
[ -paircachept pt_no | auto ]
-crearea area_no
[ -nolufORMAT ]
```

When creating the logical unit in two or more free areas.

```
au luadd -unit unit_name
[ -lu lun ] -rg rg_no -size num[ m | g | t ]
[ -stripesize 64 | 256 | 512 ]
[ -cachept pt_no ]
[ -paircachept pt_no | auto ]
-crearea area_no ...
[ -arealu lun ]
[ -nolufORMAT ]
```

When creating the logical unit using all free areas of RAID Group.

```
au luadd -unit unit_name
```

```
[ -lu lun ] -rg rg_no -size rgrest
[ -stripesize 64 | 256 | 512 ]
[ -cachept pt_no ]
[ -paircachept pt_no | auto ]
[ -arealu lun ]
[ -noluformat ]
```

When creating the logical unit in DP pool.

```
au luadd -unit unit_name
[ -lu lun ] -dppoolno pool_no -size num[ m | g | t ]
[ -cachept pt_no ]
[ -paircachept pt_no | auto ]
[ -widestriping enable | disable ]
[ -fullcapacity enable | disable ]
```

HUS

When creating the logical unit in DP pool of enabled tier mode.

```
au luadd -unit unit_name
[ -lu lun ] -dppoolno pool_no -size num[ m | g | t ]
[ -cachept pt_no ]
[ -paircachept pt_no | auto ]
[ -widestriping enable | disable ]
[ -fullcapacity enable | disable ]
[ -newpageassignmenttier high | middle | low ]
[ -monitoredio rw | r | w ]
[ -promptlypromote enable | disable ]
```

AMS, WMS, SMS, AMS2000, HUS

```
au luadd -unit unit_name --availablelist -rg rg_no
```

Description

This command sets up a logical unit.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underscore), "." (period), "@", or " " (space). Space in front and back of the character string is removed.
-lu <i>lun</i>	Specify the volume number of a volume to be added. If omitted, the Navigator will automatically apply an LU number.
-rg <i>rg_no</i>	Specify the RAID group number of a RAID group which an LU is to be added.
-size num[m g t] rest	Specify the capacity (number of blocks) of an LU. When specifying the capacity in MB, add "m" or "M" to the command option. When specifying the capacity in GB, add "g" or "G" to the command option. When specifying the capacity in TB, add "t" or "T" to the command option. If "rest" is specified for the capacity, all specified area or all max free area will be assigned. If "rgrest" is specified for the capacity, all remaining capacity of the RAID group will be assigned.
-ctl0 -ctl1	Specify the default controller number of an LU. Specify this option when the array unit is a dual system.
-stripesize 64 256 512	If you do not specify -stripesize, it uses 256K as a default size for the AMS2000 If you specify -stripesize, but leave out a value, the storage system rejects the request
-cachept <i>pt_no</i>	Specify the cache partition. If omitted this option, the Navigator will automatically assign the partition 0 or 1. <i>pt_no</i> : Partition number
-paircachept <i>pt_no</i> auto	Specify the pair cache partition. If omitted this option, the array unit makes the decision automatically. <i>pt_no</i> : Pair cache partition number auto : The array unit makes the decision automatically.
-createarea <i>area_no</i> ..	Specify the free area number of the RAID group in which the LU is to be set. Specify the number of the list displayed by the -availablelis option for the area number. Single or multiple free area numbers can be specified. Single specification : Specifying a single free area number. Example: -createarea 3 Multiple specification: Specifying multiple free area numbers. Example: -createarea 0 1 2 3 4 5 8-createarea 0-5 8

Option	Description
-head	Specify this option when creating LU from the top free area.
-arealu	Specify the maximum volume number of the free area. If omitted, the Navigator will automatically apply a volume number.
-noluformat	Specify this option when creating a volume without formatting
-availablelist	The free area of the RAID group in which the LU is to be set is displayed.
-dppool no <i>pool_no</i>	Specify the DP pool number of a DP pool which an LU is to be added.
-widestriping enable disable	Specify whether to set the full capacity mode effective or ineffective. enable : Enables the wide striping mode disable : Disables the wide striping mode
-fullcapacityenable disable	Specify whether to set the full capacity mode effective or ineffective. enable : Enables the full capacity mode disable : Disables the full capacity mode

Examples

The following example adds logical unit 100 to RAID 10 in an array with a dual system configuration, whose name is ams500a1. The capacity is 80 GB, the default controller is 0, and the cache partition is partition 0. The domain number of the RAID to be set logical unit displays the free domain number of the RAID list that can be used.

```
% aлуadd -unit ams500a1 -availablelist -rg 10
Password:
Available Areas
RAID Group : 10
No. Capacity
0 400.3 GByte
1 300.0 GByte
2 100.0 Gbyte
%
% aлуadd -unit ams500a1 -lu 100 -size 80g -ctl0 -rg 10 -cachept 0 -createarea 1
Password:
Are you sure you want to set the logical unit?
(y/n [n]): y
The logical unit has been set successfully.
%
```

The following example adds logical unit 200 to RAID 0 in an array with a dual system configuration, whose name is sms100a1. The capacity is 80 GB.

```
% aлуadd -unit sms100a1 -lu 200 -rg 0 -size 80g
Are you sure you want to set the logical unit?
(y/n [n]): y
The logical unit has been set successfully.
The format was started.
%
```

The following example adds logical unit 15 to RAID group 1 in an array with a dual system configuration, whose name is ams2300a1. The capacity is 5 TB. The domain number of the RAID group to be set logical unit displays the free domain number of the RAID group list that can be used and chooses it from them.

```
% auluadd -unit ams2300a1 -availablelist -rg 1
Available Areas
RAID Group : 1
No. Capacity
0 128.0 TB
%
% auluadd -unit ams2300a1 -lu 15 -size 5t -rg 1 -createarea 0
Are you sure you want to set the logical unit?
(y/n [n]): y
The logical unit has been set successfully.
The format was started.
%
```

Formatting the volume

Command name

auformat

Format

```
9500V
auformat -unit unit_name -online | -offline | -N | -I | -Im | -quick
-lu lun ... [ -f ]

AMS, WMS, SMS, AMS2000, HUS
auformat -unit unit_name -lu lun ... [ -f ]
```

Description

This command formats a specified logical unit. If multiple logical units are specified, logical units are formatted in the ascending order of LUNs.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-online -offline -N -I -Im -quick	Specify the formatting method.
-N	Formats in Normal mode per LU. Formatting is executed from the current controller which controls the LU. When registering the unit information, the current controller of which controls the LU that is to be formatted must be registered
-online -I	Formats in Immediate mode per volume. Formatting is executed from the current controller which controls the volume. It can format during the read/write command execution from a host. When registering the unit information, the current controller that controls the volume to be formatted must be registered.
-offline -Im	Formats in Immediate mode per volume. Formatting is executed from the current controller which controls the LU. It can format during the read/write command execution from a host. When registering the unit information, the current controller that controls the LU to be formatted must be registered.
-quick	Formats up to six volumes concurrently in the quick mode. The read/write commands from a host are accepted during the format execution. The command execution from a host is lower than the format with '-offline' or '-Im' option. When formatting in quick mode, set the priority mode by <code>auquickfmtopt</code> command.
-lu <i>lun ...</i>	Specify the LU number, which is to be formatted. Single or multiple LU numbers can be specified. Single specification : Specifying a single LU number. Example: <code>-lu 3</code> Multiple specification: Specifying multiple LU numbers. Example: <code>-lu 0 1 2 3 4 5 8</code> <code>-lu 0-5 8</code>
-f	Omits the confirmation message when the command is executed.

Examples

This example formats logical unit 0 to 10 in an array is 9500a1 in quick mode.

```
% auformat -unit 9500a1 -quick -lu 0-10
Password:
The logical unit(s) will be formatted.
The logical unit(s) have already been formatted.
Are you sure you want to format the logical unit(s)? (y/n [n]): y
If you format the logical unit(s), you will not be able to recover your data. Pl
```

```

ease make sure to perform backup of all important data before this operation.
When you format your logical unit, the data becomes unusable. Systems or applica
tions that use this subsystem will terminate abnormally. Please make sure to sto
p host access to the subsystem before performing this operation.
Are you sure you want to format the logical unit(s)? (y/n [n]): y
The logical unit(s) will be formatted.
Are you sure you want to execute? (y/n [n]): y
The format was started.
%

```

This example formats logical unit 255 in an array ams500a1.

```

% auformat -unit ams500a1 -lu 255
Password:
Are you sure you want to format the logical unit(s)? (y/n [n]): y
The format was started.
%

```

Displaying the progress of volume formatting

Command name

auformatst

Format

```

9500V, AMS, WMS, SMS, AMS2000, HUS
auformatst -unit unit_name -lu lun

```

Description

This command displays the progress of formatting logical units which was specified to format in immediate and quick mode.

When a specified logical unit is formatting, the progress of formatting is displayed in percentage. When the logical unit is not formatting, such as immediately after a logical unit has been setup or its size has been expanded, or when the formatting has been completed, the following progress is displayed:

```

"100%" when the logical unit is in normal status.
"0%" when the logical unit is in a status other than above.

```

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-" (minus), "_" (underline), "." (period), "@", or " " (space). Space in front and back of the character string is removed.
-lu <i>lun</i>	Specify the LU number, which its progress is to be checked.

Example

The following example confirms the progress after specifying to format logical unit 4 in an array 9500a1 in immediate mode.

```
% auformat -unit 9500a1 -lu 4 -l -f
Password:
LU4format start
LU4format end: Completed Successfully
%
% auformatst -unit 9500a1 -lu 4
9500a1 LU 4 17 %
% auformatst -unit 9500a1 -lu 4
9500a1 LU 4 50 %
% auformatst -unit 9500a1 -lu 4
9500a1 LU 4 81 %
% auformatst -unit 9500a1 -lu 4
9500a1 LU 4 94 %
% auformatst -unit 9500a1 -lu 4
9500a1 LU 4 100 %
%
```

Referencing/setting the quick format option

Command name

auquickfmtopt

Format

```
9500V, AMS, WMS, SMS, AMS2000, HUS
auquickfmtopt -unit unit_name --refer

9500V, AMS, WMS
auquickfmtopt -unit unit_name --set
[ -priority normal | host | format ]
[ -formatdata default | 0 ]

SMS, AMS2000, HUS100
auquickfmtopt -unit unit_name --set
[ -priority normal | host | format ]
[ -formatdata default | nonzero | 0 ]

HUS100
auquickfmtopt -unit unit_name --set
[ -priority normal | host | format ]
[ -formatdata default | nonzero | 0 | FF ]
```

Description

This command references or sets the quick format option.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " " (space). Space in front and back of the character string is removed.
-refer	Displays the quick format option.
-set	Sets the quick format option.
-priority normal host format	Specify a priority mode. normal: normal mode host : host priority mode format: format priority mode
-formatdata default 0	Specify a format data. default: default data 0 : 0 data

Examples

The following example displays the quick format option of an array 9500a1.

```
% auquickfmtopt -unit 9500a1 -refer
Priority Mode    : Normal
Format Data     : Default
%
```

The following example sets the quick format option to an array 9500a1, then displays the information.

```
% auquickfmtopt -unit 9500a1 -set -priority host
Password:
Are you sure you want to set the quick format option?
(y/n [n]): y
The quick format option has been set successfully.
%
% auquickfmtopt -unit 9500a1 -refer
Priority Mode    : Host
Format Data     : Default
%
```

The following example sets the quick format data to an array 9500a1.

```
% auquickfmtopt -unit 9500a1 -set -formatdata 0
Password:
Are you sure you want to set the quick format option?
(y/n [n]): y
The quick format option has been set successfully.
%
```

The following example sets the quick format priority mode and quick format data to an array 9500a1.

```
% auquickfmtopt -unit 9500a1 -set -priority host -formatdata 0
Password:
Are you sure you want to set the quick format option?
(y/n [n]): y
The quick format option has been set successfully.
%
```

The following example sets the quick format option to an array ams500a1.

```
% auquickfmtopt -unit ams500a1 -set -priority format
Password:
Are you sure you want to set the format option?
(y/n [n]): y
This setting of the format priority mode may affect the host access. In some cases, performance deterioration or time-out occurs.
Do you want to continue processing? (y/n [n]): y
The format option has been set successfully.
%
```

The following example sets the quick format option to an array ams500a1.

```
% auquickfmtopt -unit ams500a1 -set -priority host
Password:
Are you sure you want to set the format option?
(y/n [n]): y
The format option has been set successfully.
%
```

The following example sets the quick format option to an array hus110a1.

```
% auquickfmtopt -unit hus110a1 -refer
Priority Mode      : Normal
Format Data       : Non-Zero Data
%
```

Expanding a volume

Command name

au1uexp

Format

```
9500V
au1uexp -unit unit_name -lu lun -incr num[m | g] | rest
```

Description

This command expands the size of a logical unit. Note that only the last logical unit in each RAID can be expanded.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " " (space). Space in front and back of the character string is removed.
-lu <i>lun</i>	Specify the LU number of an LU which its size is to be expanded.
-incr num[m g] rest	Specify the increment (in the number of blocks) of the size to expand. • When specifying it in MB, add "m" or "M" to the command option. • When specifying it in GB, add "g" or "G" to the command option. • If "rest" is specified for the increment, all remaining capacity of the RAID group to which LU belongs is assigned. • If "rest" is specified for the increment, all remaining capacity of the RAID group to which LU belongs is assigned.

Examples

The following example expands the capacity of logical unit 3 in an array 9500a1 by an increment of 3,072 blocks.

```
% auluexp -unit 9500a1 -lu 3 -incr 3072
Password:
%
```

The following example assigns to logical unit 3 in an array 9500a1, all the remaining capacity of the RAID to which this logical unit belongs.

```
% auluexp -unit 9500a1 -lu 3 -incr rest
Password:
%
```

Deleting the volume

Command name

auludel

Format

```
9500V
auludel -unit unit_name -last [-f]

AMS, WMS, SMS, AMS2000, HUS
auludel -unit unit_name -lu lun ... [-f]
```

Description

This command deletes the specified logical unit.

For 9500V, deletes the last defined logical unit.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " " (space). Space in front and back of the character string is removed.
-lu <i>lun ...</i>	Specify the LU number which is to be deleted. The LUs are deleted in order that you specify them. Single or multiple LU numbers can be specified. Single specification : Specifying a single LU number. Example: -lu 3 Multiple specification: Specifying multiple LU numbers. Example: -lu 0 1 2 3 4 5 8 -lu 0-5 8
-f	Omits the confirmation message when the command is executed.

Examples

The following example deletes the last logical unit in an array 9500a1.

```
% auludel -unit 9500a1 -last
Password:
The last defined logical unit xxx will be deleted.
The last defined logical unit xxx has been formatted.
Are you sure you want to delete logical unit xxx? (y/n [n]): y
If you delete the logical unit, you will not be able to recover your data, Please make sure to perform backup of all important data before this operation.
When you delete your logical unit, the data becomes unusable. Systems or applications that use this subsystem will terminate abnormally. Please make sure to stop host access to the subsystem before performing this operation.
Are you sure you want to delete the logical unit? (y/n [n]): y
The last defined logical unit xxx will be deleted.
Are you sure you want to execute? (y/n [n]): y
The last defined logical unit xxx has been deleted.
%
```

The following example deletes the logical unit 10, 11, and 12 in an array ams500a1.

```
% auludel -unit ams500a1 -lu 10 11 12
Password:
The specified logical unit(s) will be deleted.
The specified logical unit(s) have already been formatted.
Are you sure you want to delete the specified logical unit(s)? (y/n [n]): y
If you delete the logical unit(s), you will not be able to recover your data, Please make sure to perform backup of all important data before this operation.
When you delete your logical unit, the data becomes unusable. Systems or applications that use this subsystem will terminate abnormally. Please make sure to stop host access to the subsystem before performing this operation.
Are you sure you want to delete the specified logical unit(s)? (y/n [n]): y
The specified logical unit(s) will be deleted.
Are you sure you want to execute? (y/n [n]): y
The logical unit 10 has been deleted.
```

```
The logical unit 11 has been deleted.  
The logical unit 12 has been deleted.  
The logical unit(s) have been deleted successfully.  
%
```

Changing the default controller of a volume

Command name

auluchg

Format

```
9500V, AMS, WMS  
auluchg -unit unit_name -lu lun
```

Description

This command changes the default controller of a connected logical unit to another controller.

Options.

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " (space)". Space in front and back of the character string is removed.
-lu <i>lun</i>	Specify the LU number of an LU whose default controller is to be changed.

Example

The following example changes the default controller connected to logical unit 2 in an array 9500a1.

```
% auluchg -unit 9500a1 -lu 2  
Password:  
Are you sure you want to change the default controller in charge of LU? (y/n [n])  
) y  
The default controller in charge of LU has been set successfully.  
%
```

Referencing the unified volume

Command name

aumluref

Format

9500V, AMS, WMS
aumluref -unit unit_name [-m | -g]

SMS, AMS2000, HUS
aumluref -unit unit_name [-m | -g | -t | -auto]

Description

This command refers the status of the unified LU.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-m -g -t -auto	Expresses the LU capacity unit. When the specification is omitted, the capacity is expressed in blocks. -m : MB -g : GB -t : TB -auto: If the capacity is 1 TB or more, it is displayed in TB. If 1 GB or more and less than 1 TB, it is displayed in GB. If less than 1 GB, it is displayed in GB.

Example

In the following example, the unified LU is LU 1, the SubLU is LU 3, and the capacity is shown in the unit of MB in an array sms100a1.

```
% aumluref -unit sms100a1 -m
LU   Capacity  Status
1    1057.0 MB Normal
      Sub LU
      3
%
```

Unifying volumes

Command name

aulumrg

Format

```
9500V, AMS, WMS, SMS, AMS2000, HUS
aulumrg -unit unit_name -lu main_lu sub_lu

AMS, WMS, SMS, AMS2000, HUS
aulumrg -unit unit_name -availablelist [ -lu main_lu ]
```

Description

This command unifies the logical units.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underscore), "." (period), "@", or " " (space). Space in front and back of the character string is removed.
-lu <i>main_lu sub_lu</i>	Specify the LU numbers to be unified.
-availablelist	A list of LU numbers, each of which is eligible for the unifying LU is displayed. When -lu option is specified, the Sub LU list is displayed.
-lu <i>main_lu</i>	Specify the Main LU number.

Example

The following example unifies a logical unit with the logical unit 10.

```
% aulumrg -unit sms100a1 -availablelist -lu 10
Available Logical Units
LUN Capacity RAID Group RAID Level Type Status
 0 100.0 MB      0 6(9D+2P) SAS Normal
 1 100.0 MB      0 6(9D+2P) SAS Normal
40 100.0 MB      0 6(9D+2P) SAS Regression
%
% aulumrg -unit sms100a1 -lu 10 1
The capacity of the unified logical unit will be 15.0GBs.
If the RAID level or the HDU combination of the unifying LUs does not match, the
performance may be degraded.
And the existing user data in the additional LUs will be destroyed.
Are you sure you want to unify the LUs? (y/n [n]): y
The logical units have been unified successfully.
%
```

Separating volumes

Command name

aumludiv

Format

```
9500V, AMS, WMS, SMS, AMS2000, HUS
aumludiv -unit unit_name -lu main_lu all | last
```

Description

This command separates the unified LU.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " (space)". Space in front and back of the character string is removed.
-lu <i>main_lu</i> all last	Specify the LU number to be separated. <i>main_lu</i> : Specify the LU number. all : Separates all the internal unified LUs. last : Separates the internal LU which has been unified last.

Example

In the following example, the logical unit 2 separates from the unified LU.

```
% aumludiv -unit sms100a1 -lu 2 last
Are you sure you want to separate the last LU from the unified LU? (y/n [n]): y
The logical units have been separated successfully.
%
```

Invalidating a volume

Command name

auluinvalidate

Format

```
9500V
auluinvalidate -unit unit_name -lu lun
```

Description

This command invalidates the LU. The invalidated LU cannot be used by a host. However, its data can be restored through restoration of the LU, and the invalidated LU can be reused when the LU is reassigned.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-lu <i>lun</i>	Specify a number of the LU to be invalidated.

Example

In the following example, the logical unit 2 is invalidated with array 9500.

```
% auluinvalidate -unit 9500 -lu 2
Password:
This logical unit has already been formatted.
Are you sure you want to invalidate logical unit 2? (y/n [n]): y
The setting ended normally.
%
```

Reassigning a volume

Command name

aulureallocate

Format

```
9500V
aulureallocate -unit unit_name -lu lun
               -size num[ m | g ] | all [ -nlu new_lun ]
```

Description

This command makes the invalidated LU usable by assigning a part or all of its area. When a part of the LU is assigned, the rest of the area is set as a new LU. The new LU is placed in a state in which it is invalidated. Both logical units are unformatted after the reassignment is executed.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_", ".", "@", or " (space)". Space in front and back of the character string is removed.
-lu <i>lun</i>	Specify a number of the LU to be reassigned.
-size num[m g] all	Specify a capacity (number of blocks) of the LU to be reassigned. When specifying it in MB, add "m" or "M" to the command option. When specifying it in GB, add "g" or "G" to the command option. When a character string, "all" is specified for the capacity, the whole capacity of the invalidated LU is assigned.
-nlu <i>new_lun</i>	Specify a number of the LU to be generated through an assignment of the residual capacity after the reassignment is executed. When the specification of an LU number is omitted, Navigator determines the number as the least one of numbers of unused LUs automatically. When the -size is specified as "all", however, this option cannot be specified.

Example

In the following example, the logical unit 2 is reallocated with array 9500.

```
% aulureallocate -unit 9500 -lu 2 -size 100m -nlu 10
Password:
Are you sure you want to reallocate logical unit 2?
New logical unit 10 is created in remained area. (y/n [n]): y
After it performs; the reallocated area cannot be brought back to the original l
ogical unit any more.
Do you want to continue processing? (y/n [n]): y
The setting ended normally.
%
```

Restoring a volume

Command name

aulurestoration

Format

```
9500V
aulurestoration -unit unit_name -lu lun
```

Description

This command restores the invalidated LU as it was before.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-lu <i>lun</i>	Specify a number of the LU to be restored.

Example

In the following example, the invalidated LU 2 is restored with array 9500.

```
% aulurestoration -unit 9500 -lu 2
Password:
Are you sure you want to restore logical unit 2? (y/n [n]): y
The setting ended normally.
%
```

Referencing/starting/skipping/canceling parity correction online

Command name

aulucorrect

Format

```
9500V
aulucorrect -unit unit_name -refer
[ -status [ uncorrected ] [ aborted ] [ correcting ]
[ waiting ] [ skipped ] ]

AMS, WMS, SMS, AMS2000, HUS
aulucorrect -unit unit_name -refer
[ -status [ uncorrected ] [ aborted ] [ correcting ]
[ waiting ] [ skipped ]
[ uncorre_drvdetach ] [ waiting_drvreconst ] ]

9500V, AMS, WMS, SMS, AMS2000, HUS
aulucorrect -unit unit_name -start [ -luorder lun ... ]
```

```

aulucorrect -unit unit_name -skip [ -lu lun ... ]
aulucorrect -unit unit_name -cancel -lu lun ...
aulucorrect -unit unit_name -lucorrectlist

```

Description

This command refers to a status of LU correction by means of parity, starts, skips, cancel, or display list for recovery.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_", ".", "@", or " " (space). Space in front and back of the character string is removed.
-refer	References a status of the LU correction by means of parity.
-status [uncorrected] [aborted] [correcting] [waiting] [skipped] [uncorre_drvdetach] [waiting_drvreconst]	Specify a status of an LU you want to refer to. When the specification is omitted, all the statuses are displayed. One or more of the statuses can be specified. uncorrected : Uncorrected aborted : Correction Aborted correcting : Parity Correcting waiting : Waiting Parity Correction skipped: Correction Skipped uncorre_drvdetach: Uncorrected and Drive Detached waiting_drvreconst: Waiting Drive Reconstruction
-start	This option starts correction of the LU(s) by means of parity. When at least one LU, for which the correction has not been made, exists besides the specified LU(s), a confirmation message is displayed. The correction is made for the specified LU(s) in order of the specification, and then for the remaining LU(s) for which the correction has not been made. When the specification of LU(s) is omitted, the correction is made for all LUs for which the correction has not been made.

Option	Description
-skip	This option skips correction of the LU(s) by means of parity. When at least one LU, for which the correction has not been made, exists besides the specified LU(s), a confirmation message is displayed. The correction is made for the specified LU(s), and then for the remaining LU(s) for which the correction has not been made. When the specification of LU(s) is omitted, the correction is made for all LUs for which the correction has not been made
-cancel	This option cancels correction of an LU by means of parity. Execution is impossible when LU for which the correction has not been made exists.
-luorder <i>lun</i> ...	Specify number(s) of LU(s) for each of which the correction by means of parity is to be started, in order of making correction. One or more LU number(s) can be specified. Single specification : Specify a single LU number. Example: -luorder 3 Multiple specification: Specify multiple LU numbers. Example: -luorder 0 1 2 3 4 5 8 -luorder 0-5 8
-lu <i>lun</i> ...	Specify number(s) of LU(s) for which correction by means of parity is to be skipped or aborted. One or more LU number(s) can be specified. Single specification : Specify a single LU number. Example: -lu 3 Multiple specification: Specify multiple LU numbers. Example: -lu 0 1 2 3 4 5 8 -lu 0-5 8
-lucorrectlist	This option displays the list of LU which needs parity correction. The state of LU which needs parity correction is as follows: - Uncorrected - Uncorrected and Drive Detached

Examples

The following example displays the parity correction statuses of an array ams500.

```
% aulucorrect -unit ams500 -refer
Password:
Uncorrected
  LUN
    1

Correction Aborted
  LUN

Correction Skipped
  LUN

Parity Correcting
  LUN Progress
```

```
Waiting Parity Correction
LUN Waiting Order Progress

Waiting Drive Reconstruction
LUN

%
```

The following example starts the parity correction of an array 9500.

```
% aulucorrect -unit 9500 -start
Password:
There are no uncorrected logical units.
%
```

Referencing/setting the mapping guard information

Command name

aumapguard

Format

```
9500V, AMS, WMS, SMS, AMS2000, HUS
aumapguard -unit unit_name -refer [-lu lun ...]

aumapguard -unit unit_name -set -lu lun ... -guard enable | disable
```

Description

This command references or sets the mapping guard information.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	Displays the mapping guard information.
-set	Sets the mapping guard information.

Option	Description
-lu <i>lun</i> ...	Specify the LU numbers to reference or set the mapping guard information. When doing that, enter the LU number using numerals or a hyphen(s) (-). Single or multiple LU numbers can be specified. When the -refer option is specified: If the specification is omitted, all the mapping guard information is displayed. Single specification : Specifying a single LU number. Example: -lu 3 Multiple specification: Specifying multiple LU numbers. Example: -lu 0 1 2 3 4 5 8 -lu 0-5 8
-guard enable disable	Specify whether to set the mapping guard effective or ineffective. enable : Enables the mapping guard disable: Disables the mapping guard

Examples

The following example displays the mapping guard information of an array 9500.

```
% aumapguard -unit 9500 -refer
Password:
LUN Mapping Guard Status
0 Disable Normal
1 Disable Unformat
2 Enable Normal
3 Disable Undefined
:
%
```

The following example sets the mapping guard information of LU 100 of an array 9500.

```
% aumapguard -unit 9500 -set -lu 100 -guard enable
Password:
Are you sure you want to change the mapping guard? (y/n [n]): y
The mapping guard has been successfully changed.
%
```

Refer to the mapping guard information of ams2300 using Storage Navigator Modular 2 whose version is 10.00 or more. The defined LUN or the LUN whose mapping guard is set to enable is displayed.

```
% aumapguard -unit 9500 -refer
Password:
LUN Mapping Guard Status
0 Disable Normal
1 Disable Normal
2 Disaable Normal
100 Disable Normal
200 Disable Normal
300 Disable Normal
1000 Enable Undefined
:
%
```

Referencing/setting volume cache partition

Command name

aulucachept

Format

```
AMS, WMS, SMS, AMS2000, HUS
aulucachept -unit unit_name -refer [-lu lun ...]

AMS, WMS, AMS200, HUS
aulucachept -unit unit_name -set -lu lun ... -pt pt_no
aulucachept -unit unit_name -set -lu lun ... -pairpt pt_no | auto
```

Description

This command references or sets the LU cache partition.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	Displays the LU cache partition
-set	Sets the LU cache partition.
-pt <i>pt_no</i>	Specify the partition. pt_no: Partition number
-pairpt <i>pt_no</i> auto	Specify the pair cache partition. pt_no: Pair cache partition number auto : The array unit makes the decision automatically.
-lu <i>lun ...</i>	Specify the LU number, which is to be referenced or to be set. Single or multiple LU numbers can be specified. Single specification : Specifying a single LU number. Example: -lu 3 Multiple specification: Specifying multiple LU numbers. Example: -lu 0 1 2 3 4 5 8 -lu 0-5 8

Example

The following example displays the logical unit cache partition information of an array ams500a1.

```
% aulucachept -unit ams500a1 -refer
      Cache      Pair Cache      Current Cache
LUN   Partition  Partition  Partition
0      0          0          0
:
:
%
```

Changing the volume size

Command name

auluchgsize

Format

```
SMS, AMS2000, HUS
auluchgsize -unit unit_name -lu lun -size num[ m | g | t ]
              [ -area area_no ... ] [ -arealu lun ]
auluchgsize -unit unit_name -lu lun -size rest
              -area area_no [ -arealu lun ]
auluchgsize -unit unit_name -lu lun -size rgest
              [ -arealu lun ]

AMS2000, HUS
```

Description

This command changes the LU size.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), ".", "@", or " (space)". Space in front and back of the character string is removed.
-lu <i>lun</i>	Specify the number of logical unit which change the size.
-size num[m g t] rest rgreset	Specify the LU capacity (number of blocks) after it changes. When specifying the capacity in MB, add "m" or "M" to the command option. When specifying the capacity in GB, add "g" or "G" to the command option. When specifying the capacity in TB, add "t" or "T" to the command option. If "rest" is specified, all capacity of the specified free area will be assigned. If "rgreset" is specified, all free area of the RAID group will be assigned.
-area <i>area_no</i>	Specify the free area number of the RAID group in which the LU is to be grown. Specify the number of the list displayed by the -availablelist option of aulualu command for the area number. Single or multiple free area numbers can be specified. Single specification : Specifying a single free area number. Example: -area 3 Multiple specification: Specifying multiple free area numbers. Example: -area 0 1 2 3 4 5 8 -area 0-5 8
-arealu	Specify the max LU number of the free area. If omitted, the Navigator will automatically apply an LU number.
-dooptimize	Specify when executing the DP optimization after changing capacity.

Example

The following example changes the logical unit 0 size of an array ams2300a1.

```
% auluchgsize -unit ams2300a1 -lu 0 -size 10g
Are you sure you want to grow the logical unit?
(y/n [n]): y
The logical unit has been grown successfully.
%
```

```
% auluchgsize -unit ams2300a1 -lu 0 -size 100g
Are you sure you want to shrink the logical unit?
(y/n [n]): y
If you shrink the logical units, you will not be able to recover your data for the reduction.
Please make sure to perform backup of all important data before this operation.
When you shrink your logical unit, the data becomes unusable. Systems or applications that use this array will terminate abnormally. Please make sure to stop the host access to the array before performing this operation.
Are you sure you want to shrink the logical unit? (y/n [n]): y
The specified logical unit will be shrunk.
Are you sure you want to execute? (y/n [n]): y
The logical unit has been shrunk successfully.
%
```

System parameters

This section covers the following commands related to system parameters:

- [Referencing/setting system parameters on page 3-94](#)
- [Referencing/setting system parameters online on page 3-97](#)
- [Referencing/setting system parameters on page 3-101](#)
- [Referencing/setting the RTC on page 3-107](#)
- [Referencing/setting LAN information on page 3-108](#)
- [Referencing/setting the port option on page 3-110](#)
- [Referencing/setting the boot option on page 3-115](#)
- [Referencing/setting the time zone on page 3-117](#)
- [Referencing/setting the IP address of the maintenance port on page 3-119](#)
- [Referencing/setting LAN information online on page 3-121](#)



NOTE: When the AMS/WMS array connects to the NAS, restarting the array stops the cluster between the NAS units stop along and restarts the array. When restarting the array, stop the cluster between the NAS units, and then restart the array. Thereafter, start the cluster between the NAS units again.



NOTE: If you restart the array after issuing a power down instruction but before the power down with Power Savings enabled completes, the power down may fail because the array receives a command from a host immediately after the array restarts. If power down fails, perform the power down again. Check that the power down instruction has not been issued or has been completed (no RAID in the Power Saving Status of Normal (Command Monitoring) exists) before restarting the array.

Referencing/setting system parameters

Command name

ausystemparam

Format

AMS, WMS, SMS, AMS2000, HUS
ausystemparam -unit unit_name --refer

AMS, WMS
ausystemparam -unit unit_name --set
[-LuCacheWarning enable | disable]
[-WriteUniqueResponse enable | disable]
[-AutoReconst enable | disable]
[-ForcedWriteThrough enable | disable]
[-LUChangeDisable enable | disable]
[-ShadowImageIOSwitch enable | disable]
[-SyncCacheExec enable | disable]
[-DriveDetach enable | disable]
[-ProcessorFailures reset | shutdown]
[-WebTitle string]
[-WriteVerifyExecution ctl_no on | off]

SMS, AMS2000, HUS
ausystemparam -unit unit_name --set
[-LuCacheWarning enable | disable]
[-WriteUniqueResponse enable | disable]
[-AutoReconst enable | disable]
[-ForcedWriteThrough enable | disable]
[-ShadowImageIOSwitch enable | disable]
[-SyncCacheExec enable | disable]
[-DriveDetach enable | disable]
[-LowerDriveDetachThres enable | disable]
[-ProcessorFailures reset | shutdown]
[-WebTitle string]
[-WriteVerifyExecution ctl_no on | off]

Description

This command references the contents of system parameters or set the parameters.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	References the system parameters.
-set	Sets the system parameters.
-LuCacheWarning enable disable	Specify whether or not to report a warning when the Cache Residency LU function is set effective. enable : Reports warning. disable: Does not report warning.
- WriteUniqueResponse enable disable	Specify whether to set the Write Unique Response Mode effective or ineffective.
-AutoReconst enable disable	Specify whether to set the Auto Reconstruction Mode effective or ineffective. enable : Enables the Auto Reconstruction Mode. disable: Disables the Auto Reconstruction Mode
-ForcedWriteThrough enable disable	Specify whether to set the Forced Write Through Mode effective or ineffective. enable : Enables the Forced Write Through Mode. disable: Disables the Forced Write Through Mode.
-LUChangeDisable enable disable	Specify whether to set the LU Ownership Change Disable Mode effective or ineffective. enable : Enables the LU Ownership Change Disable Mode. disable: Disables the LU Ownership Change Disable Mode.
- ShadowImageIOSwitch enable disable	Specify whether to set the ShadowImage I/O Switch Mode effective or ineffective. enable : Enables the ShadowImage I/O Switch Mode. disable: Disables the ShadowImage I/O Switch Mode
-SyncCacheExec enable disable	Specify whether to set the Synchronize Cache Execution Mode effective or ineffective. enable : Enables the Synchronize Cache Execution Mode. disable: Disables the Synchronize Cache Execution Mode.
-DriveDetach enable disable	Specifies whether to set the drive blockage mode effective or ineffective. enable : Enables the drive blockage mode. disable: Disables the drive blockage mode.

Option	Description
-ProcessorFailures reset shutdown	Specify action when a processor failure occurs. reset : Resets the failure and restarts the controller. shutdown: Shuts down the array unit.
-WebTitle <i>string</i>	If the home page of the array unit is displayed with the browser, this option specifies a character string displayed on the title bar of the browser. Enter up to 32 one-byte coded alphanumeric characters or characters (except for the ' (single quotation mark), " (double quotation mark), and \ (backslash) symbols) other than numeric.
- WriteVerifyExecution <i>ctl_no</i> on off	Specify the execution of the write & verify operation. <i>ctl_no</i> : Controller number (0, 1). on : Executes write & verify operation. off : Does not execute write & verify operation.

Example

The following example displays the system parameters of an array ams500a1.

```
% ausystemparam -unit ams500a1 -refer
Password:
---- Common Parameter ----
Options
Turbo LU Warning = OFF
Write Unique Response Mode = OFF
Auto Reconstruction Mode = OFF
Forced Write Through Mode = OFF
LU Ownership Change Disable Mode = OFF
ShadowImage I/O Switch Mode = OFF
Synchronize Cache Execution Mode = OFF
Drive Detach Mode = OFF
Operation if the Processor failures Occurs = Reset the Fault
Web Title
Web Title = ""
---- CTL0 Parameter ----
Write & Verify Execution Mode = ON
---- CTL1 Parameter ----
Write & Verify Execution Mode = ON
%
```

The following example displays the system parameters of an array ams2300a1.

```
% ausystemparam -unit ams2300a1 -refer
---- Common Parameter ----
Options
Turbo LU Warning = OFF
Write Unique Response Mode = OFF
Auto Reconstruction Mode = OFF
Forced Write Through Mode = OFF
ShadowImage I/O Switch Mode = OFF
Synchronize Cache Execution Mode = OFF
Drive Detach Mode = OFF
Lower Drive Detach Threshold Mode = OFF
Operation if the Processor failures Occurs = Reset the Fault
Web Title
Web Title = ""
---- CTL0 Parameter ----
Write & Verify Execution Mode = ON
---- CTL1 Parameter ----
Write & Verify Execution Mode = ON
%
```

Referencing/setting system parameters online

Command name

auonsysprm

Format

```
9500V
auonsysprm -unit unit_name --refer

auonsysprm -unit unit_name --set
[ -PROCOM          enable | disable ]
[ -ReportStatus    enable | disable ]
[ -LuCacheWarning  enable | disable ]
[ -NX              enable | disable ]
[ -AutoReconst     enable | disable ]
[ -ForcedWriteThrough enable | disable ]
[ -LUChanging1     enable | disable ]
[ -MultiStream     enable | disable ]
[ -MultiStreamWrite enable | disable ]
[ -MultiStreamRead  enable | disable ]
[ -HiSpeedSeqWrite  enable | disable ]
[ -ShadowImageIOSwitch enable | disable ]
[ -SyncCacheAllExec enable | disable ]
[ -SyncCacheInvalid enable | disable ]
[ -DriveDetach     enable | disable ]
[ -ProcessorFailures reset | shutdown ]
[ -inquiryCommandQueue on | off ]
[ -WebTitle        string ]
[ -Rs232cOutflow   ctl_no off | normal | hitrack ]
[ -WriteVerifyExecution ctl_no on | off ]
```

Description

This command references the contents of system parameters or set the parameters online.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	References the system parameters.
-set	Sets the system parameters.
-PROCCom enable disable	Specify whether to set the PROCCom mode effective or ineffective. enable : Enables the PROCCom mode. disable: Disables the PROCCom mode.
-ReportStatus enable disable	Specify whether to set the warning status reporting mode effective or ineffective. enable : Enables the warning status report. disable: Disables the warning status report.
-LuCacheWarning enable disable	Specify whether or not to report a warning when the turbo LU function is set effective. enable : Reports warning. disable: Does not report warning.
-NX enable disable	Specify whether to set the NX host connection mode effective or ineffective. enable : Enables the NX host connection mode. disable: Disables the NX host connection mode.
-AutoReconst enable disable	Specify whether to set the auto reconstruction mode effective or ineffective. enable : Enables the auto reconstruction mode. disable: Disables the auto reconstruction mode.
- ForcedWriteThrough enable disable	Specify whether to set the forced write through mode effective or ineffective. enable : Enables the forced write through mode. disable: Disables the forced write through mode.
-LUChanging1 enable disable	Specify whether to set the Changing Logical Unit Mode 1 effective or ineffective. enable : Enables the Changing Logical Unit Mode 1. disable: Disables the Changing Logical Unit Mode 1.

Option	Description
-MultiStream enable disable	Specify whether to set the Multiple Stream Mode effective or ineffective. enable : Enables the Multiple Stream Mode. disable: Disables the Multiple Stream Mode.
-MultiStreamWrite enable disable	Specify whether to set the Multiple Stream Read Mode effective or ineffective. enable : Enables the Multiple Stream Read Mode. disable: Disables the Multiple Stream Read Mode.
-MultiStreamRead enable disable	Specify whether to set the Multiple Stream Read Mode effective or ineffective. enable : Enables the Multiple Stream Read Mode. disable: Disables the Multiple Stream Read Mode.
-HiSpeedSeqWrite enable disable	Specify whether to set the High-speed Sequential Write Mode effective or ineffective. enable : Enables the High-speed Sequential Write Mode. disable: Disables the High-speed Sequential Write Mode.
-ShadowImageIOS witch enable disable	Specify whether to set the ShadowImage I/O Switch Mode effective or ineffective. enable : Enables the ShadowImage I/O Switch Mode. disable: Disables the ShadowImage I/O Switch Mode.
-SyncCacheAllExec enable disable	Specify whether to set the ShadowImage I/O Switch Mode effective or ineffective. enable : Enables the ShadowImage I/O Switch Mode. disable: Disables the ShadowImage I/O Switch Mode.
-SyncCacheInvalid enable disable	Specify whether to set the Synchronize Cache Invalid Mode effective or ineffective. enable : Enables the Synchronize Cache Invalid Mode. disable: Disables the Synchronize Cache Invalid Mode.
-DriveDetach enable disable	Specifies whether to set the drive blockage mode effective or ineffective. enable : Enables the drive blockage mode. disable: Disables the drive blockage mode.

Option	Description
-ProcessorFailures reset shutdown	Specify action when a processor failure occurs. reset : Resets the failure and restarts the controller. shutdown: Shuts down the array unit.
- inquiryCommandQ ueue on off	Specify execution of command queuing for INQUIRY response information. on : Executes command queuing. off: Suppresses command queuing.
-WebTitle <i>string</i>	If the home page of the array unit is displayed with the browser, this option specifies a character string displayed on the title bar of the browser. Enter up to 32 one-byte coded alphanumeric characters or characters (except for the ' (single quotation mark), " (double quotation mark), and \ (backslash) symbols) other than numeric.
-Rs232cOutflow <i>ctl_no</i> off normal hitrack	Sets the mode of sending out error information onto RS232C. <i>ctl_no</i> : Controller number (0, 1). off : Does not send out information. normal : Sends out information. hitrack: Sends out information in the HITRACK mode.
- WriteVerifyExecuti on <i>ctl_no</i> on off	Specify the execution of the write & verify operation. <i>ctl_no</i> : Controller number (0, 1). on : Executes write & verify operation. off : Does not execute write & verify operation.

The following example displays the system parameters of an array 9500a1.

```
% auonsysprm -unit 9500a1 -refer
Password:
---- Common Parameter ----
Options
  PROCOM mode enable = OFF
  Report status (normal / warning) = OFF
  Turbo LU Warning = OFF
  NX Mode = OFF
  Auto Reconstruction Mode = OFF
  Forced Write Through Mode = OFF
  Changing Logical Unit Mode 1 = OFF
  Multiple Stream Mode = OFF
  Multiple Stream Mode (Write) = OFF
  Multiple Stream Mode (Read) = OFF
  High-speed Sequential Write Mode = OFF
  ShadowImage I/O Switch Mode = OFF
  Synchronize Cache All Execution Mode = OFF
  Synchronize Cache Invalid Mode = OFF
  Drive Detach Mode = OFF
  Operation if the Processor failures Occurs = Reset a Fault
INQUIRY Information
  Command Queuing = OFF
Web Title
  Web Title = ""
---- CTL0 Parameter ----
  RS232C Error Information Outflow Mode = OFF
  Write & Verify Execution Mode = ON
---- CTL1 Parameter ----
```

Referencing/setting system parameters

Command name

ausysparam

Format

```
9500V
ausysparam -unit unit_name --refer

ausysparam -unit unit_name --set
[ -SystemStartup      Single | DualIDTake | DualNotIDTake |
  HotIDTake | HotNotIDTake ]
[ -TakingID          port_no cti_no ]
[ -DataShare          used | notUsed ]
[ -DelayPlannedShutdown time ]
[ -DriveDetach        enable | disable ]
[ -PROCUM             enable | disable ]
[ -ReportStatus       enable | disable ]
[ -LuCacheWarning     enable | disable ]
[ -NX                 enable | disable ]
[ -AutoReconst        enable | disable ]
[ -ForcedWriteThrough enable | disable ]
[ -LUChanging1        enable | disable ]
[ -MultiStream        enable | disable ]
[ -MultiStreamWrite   enable | disable ]
[ -MultiStreamRead    enable | disable ]
[ -HiSpeedSeqWrite    enable | disable ]
[ -ShadowImageIOSwitch enable | disable ]
[ -SyncCacheAllExec   enable | disable ]
[ -SyncCacheInvalid   enable | disable ]
[ -ProcessorFailures  reset | shutdown ]
[ -inquiryCommandQueue on | off ]
[ -inquiryVendor      string ]
[ -inquiryProduct     string ]
[ -inquiryRomMicro    string ]
[ -inquiryRamMicro    string ]
[ -WebTitle           string ]
[ -Rs232cOutflow      cti_no off | normal | hitrack ]
[ -WriteVerifyExecution cti_no on | off ]
[ -dhcp               cti_no enable | disable ]
[ -IPAddress          cti_no inet_addr ]
[ -SubnetMask         cti_no netmask ]
[ -DefaultGateway     cti_no gateway ]
```

Description

This command references the contents of system parameters or set the parameters.



NOTE: If LAN configuration information (such as an IP Address) is modified, an error message (Interface Error) may be displayed when restarting an array, without displaying a restart completion message. When modifying LAN configuration information, restart the array manually.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	References the system parameters.
-set	Sets the system parameters.
-SystemStartup Single DualIDTake DualNotIDTake HotIDTake HotNotIDTake	Specify the configuration of an array unit. Single : Single DualIDTake : Dual active (with a taking over SCSI ID). DualNotIDTake: Dual active (without taking over SCSI ID). HotIDTake : Hot standby (with taking over SCSI ID). HotNotIDTake : Hot standby (without taking over SCSI ID).
-TakingID <i>port_no</i> <i>ctl_no</i>	Specify the default controller of each port when a dual active configuration used the SCSI ID take over. <i>port_no</i> : Port number (A, B, C, D). <i>ctl_no</i> : Controller number (0, 1).
-DataShare used notUsed	Specify the data share mode. used : Uses the data share mode. notUsed: Does not use the data share mode.
- DelayPlannedShut down <i>time</i>	Specify the time in minutes to delay the execution of the planned shutdown when the main switch has turned off. The applicable range is from 0 to 60 minutes in unit of 1 minute. The default value is 0
-DriveDetach enable disable	Specify whether to set the drive blockage mode effective or ineffective. enable : Enables the drive blockage mode. disable: Disables the drive blockage mode.
-PROCOM enable disable	Specify whether to set the PROCOM mode effective or ineffective. enable : Enables the PROCOM mode. disable: Disables the PROCOM mode.
-ReportStatus enable disable	Specify whether to set the warning status reporting mode effective or ineffective. enable : Enables the warning status report. disable: Disables the warning status report.
-LuCacheWarning enable disable	Specify whether or not to report a warning when the turbo LU function is set effective. enable : Reports warning. disable: Does not report warning.

Option	Description
-NX enable disable	Specify whether to set the NX host connection mode effective or ineffective. enable : Enables the NX host connection mode. disable: Disables the NX host connection mode
-AutoReconst enable disable	Specify whether to set the auto reconstruction mode effective or ineffective. enable : Enables the auto reconstruction mode. disable: Disables the auto reconstruction mode.
- ForcedWriteThrough enable disable	Specify whether to set the forced write through mode effective or ineffective. enable : Enables the forced write through mode. disable: Disables the forced write through mode.
-LUChanging1 enable disable	Specify whether to set the Changing Logical Unit Mode 1 effective or ineffective. enable : Enables the Changing Logical Unit Mode 1. disable: Disables the Changing Logical Unit Mode 1.
-MultiStream enable disable	Specify whether to set the Multiple Stream Mode effective or ineffective. enable : Enables the Multiple Stream Mode. disable: Disables the Multiple Stream Mode.
-MultiStreamWrite enable disable	Specify whether to set the Multiple Stream Write Mode effective or ineffective. enable : Enables the Multiple Stream Write Mode. disable: Disables the Multiple Stream Write Mode.
-MultiStreamRead enable disable	Specify whether to set the Multiple Stream Read Mode effective or ineffective. enable : Enables the Multiple Stream Read Mode. disable: Disables the Multiple Stream Read Mode.
-HiSpeedSeqWrite enable disable	Specify whether to set the High-speed Sequential Write Mode effective or ineffective. enable : Enables the High-speed Sequential Write Mode. disable: Disables the High-speed Sequential Write Mode.

Option	Description
- ShadowImageIOS witch enable disable	Specify whether to set the High-speed Sequential Write Mode effective or ineffective. enable : Enables the High-speed Sequential Write Mode. disable: Disables the High-speed Sequential Write Mode.
-SyncCacheAllExec enable disable	Specify whether to set the ShadowImage I/O Switch Mode effective or ineffective. enable : Enables the ShadowImage I/O Switch Mode. disable: Disables the ShadowImage I/O Switch Mode.
-ProcessorFailures reset shutdown	Specify the action when a processor failure occurs. reset : Resets the failure and restarts the controller. shutdown: Shuts down the array unit.
- inquiryCommandQ ueue on off	Specify execution of command queuing for INQUIRY response information. on : Executes command queuing. off: Suppresses command queuing.
-inquiryVendor <i>string</i>	Specify execution of command queuing for INQUIRY response information. on : Executes command queuing. off: Suppresses command queuing.
-inquiryProduct <i>string</i>	Specify the product type of Inquiry response information in less than or equal to 16 characters. If you want to enter NULL characters, enter "
-inquiryRomMicro <i>string</i>	Specify the ROM microprogram version of Inquiry response information in less than or equal to 2 characters. If you want to enter NULL characters, enter ""
-inquiryRamMicro <i>string</i>	Specify the RAM microprogram version of Inquiry response information in less than or equal to 2 characters. If you want to enter NULL characters, enter "".
-WebTitle <i>string</i>	If the home page of the array unit is displayed with the browser, this option specifies a character string displayed on the title bar of the browser. Enter up to 32 one-byte coded alphanumeric characters or characters (except for the ' (single quotation mark), " (double quotation mark), and \ (backslash) symbols) other than numeric.

Option	Description
-Rs232cOutflow <i>ctl_no</i> off normal hitrack	Sets the mode of sending out error information onto RS232C. <i>ctl_no</i> : Controller number (0, 1). off : Does not send out information. normal : Sends out information. hitrack: Sends out information in the HITRACK mode.
-WriteVerifyExecution <i>ctl_no</i> on off	Specify the execution of the write & verify operation. <i>ctl_no</i> : Controller number (0, 1). on : Executes write & verify operation. off : Does not execute write & verify operation.
-dhcp <i>ctl_no</i> enable disable	Specify the execution of the write & verify operation. <i>ctl_no</i> : Controller number (0, 1). on : Executes write & verify operation. off : Does not execute write & verify operation.
-IPAddress <i>ctl_no</i> <i>inet_addr</i>	Specify the IP address. <i>ctl_no</i> : Controller number (0, 1). <i>inet_addr</i> : IP address (format xxx.xxx.xxx.xxx)
-SubnetMask <i>ctl_no netmask</i>	Specify the subnet mask. <i>ctl_no</i> : Controller number (0, 1). <i>netmask</i> : Subnet mask (format xxx.xxx.xxx.xxx).
-DefaultGateway <i>ctl_no gateway</i>	Specify the default gateway. <i>ctl_no</i> : Controller number (0, 1). <i>gateway</i> : Default gateway (format xxx.xxx.xxx.xxx).

Examples

The following example displays the system parameters of an array 9500a1.

```
% ausysparam -unit 9500a1 -refer
Password:
System parameter list.

DF Name : 9500a1
Date : 2004/04/20 13:00:00
Firmware Revision : 0658
Array Unit Type : 9500V
Serial Number : nnnnnnnn

---- Common Parameter ----
System Startup Attribute = Dual Active Mode
SCSI ID/Port ID Take-over Mode = ---
Data Share Mode = Used
Delay Planned Shutdown = 0
Option 1
Drive Detach mode enable = OFF
Option 2
PROCOM mode enable = OFF
```

```

Report status (normal / warning) = OFF
Turbo LU Warning = OFF
NX Mode = OFF
Auto Reconstruction Mode = OFF
Forced Write Through Mode = OFF
Changing Logical Unit Mode 1 = OFF
Multiple Stream Mode = OFF
Multiple Stream Mode (Write) = OFF
Multiple Stream Mode (Read) = OFF
High-speed Sequential Write Mode = OFF
ShadowImage I/O Switch Mode = OFF
Synchronize Cache All Execution Mode = OFF
Synchronize Cache Invalid Mode = OFF
Operation if the Processor failures Occurs = Reset a Fault
INQUIRY Information
Command Queuing = ON
Vendor ID = HITACHI
Product ID = DF600F
ROM Microprogram Version =
RAM Microprogram Version =
Web Title
Web Title = ""

---- CTL0 Parameter ----
RS232C Error Information Outflow Mode = OFF
Write & Verify Execution Mode = ON
LAN Const
DHCP = OFF
IP Address = 0.0.0.0
Subnet Mask = 0.0.0.0
Default Gateway = 0.0.0.0
Ether Address = 00:00:87:B4:62:4C
---- CTL1 Parameter ----
RS232C Error Information Outflow Mode = OFF
Write & Verify Execution Mode = ON
LAN Const
DHCP = OFF
IP Address = 0.0.0.0
Subnet Mask = 0.0.0.0
Default Gateway = 0.0.0.0
Ether Address = 00:00:87:B4:62:1C
%
```

The following example sets a system parameter, to suppress the mode that sends error information to RS232C interface, for an array 9500a1.

```

% ausysparam -unit 9500a1 -set -Rs232cOutflow 0 off
Password:
When executing the command, the subsystem stops accepting access from the host.
Do you want to continue? (y/n [n]): y
In order to complete the setting, it is necessary to reboot the subsystem.
Host will be unable to access the subsystem while restarting. Host applications
that use the subsystem will terminate abnormally. Please stop host access before
you restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting begins.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute? (y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 4 - 15min.
The subsystem restarted successfully.
%
```



NOTE: When setting all the system parameter in Windows®, you cannot set them on a command prompt due to the limitation on the number of characters. Create the contents of the settings in a bat file, and then execute the appropriate command. It may take time for an array to respond, depending on the condition of the array. If the array does not respond after 15 minutes, check the condition of the array.

Referencing/setting the RTC

Command name

aurtc

Format

```
9500V, AMS, WMS, SMS, AMS2000, HUS
aurtc -unit unit_name -refer

aurtc -unit unit_name -set -auto [ -f ]

aurtc -unit unit_name -set -manual -date yyyy/mm/dd -time HH:MM:SS [ -f ]
```

Description

This command references and sets the RTC.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	References RTC.
-set	Sets the RTC.
-auto	Sets the date and time of the machine which the Navigator is running, on RTC.
-manual	Sets the date and time specified by -date and -time options, to RTC.
-date <i>yyyy/mm/dd</i>	Specify the date to be set. <i>yyyy</i> : in A.D. (2000 to 2099) (For 9500V, 1990 to 2089). <i>mm</i> : month (01 to 12). <i>dd</i> : day (01 to 31).
-time <i>HH:MM:SS</i>	Specify the time to be set. <i>HH</i> : hour (00 to 23). <i>MM</i> : minute (00 to 59). <i>SS</i> : second (00 to 59). -f Omits the confirmation message when the command is executed.

Examples

The following example displays the RTC of an array 9500a1.

```
% aurtc -unit 9500a1 -refer
Password:
Date 2007/04/28   Time 18:14:28
%
```

The following example automatically sets the RTC of an array 9500a1.

```
% aurtc -unit 9500a1 -set -auto
Password:
Are you sure you want to set the RTC? (y/n [n]): y
The RTC has been set successfully.
%
```

Referencing/setting LAN information

Command name

aulan

Format

```
9500V, AMS, WMS
aulan -unit unit_name --refer

9500V
aulan -unit unit_name -set -ctl0 | -ctl1
    [ -addr inet_addr ] [ -mask netmask ] [ -gate gateway ]
    [ -dhcp enable | disable ]

AMS, WMS
aulan -unit unit_name --set
    -ctl0 | -ctl1 [ -addr inet_addr ]
    [ -mask netmask ]
    [ -gate gateway ]
    [ -dhcp enable | disable ]
    [ -mipchg ]

aulan -unit unit_name --set
    [ -mipchgmode enable | disable ]
    [ -ctl0 | -ctl1 [ -addr inet_addr ]
    [ -mask netmask ]
    [ -gate gateway ]
    [ -nego auto | 10mh | 10mf | 100mh | 100mf ]
    [ -dhcp enable | disable ]]
```

Description

This command displays and sets LAN information of the array.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and back of the character string is removed.
-refer	References LAN information.
-set	Sets LAN information.
-ctl0 -ctl1	Specify the controller.
-addr <i>inet_addr</i>	Specify the IP addresses.
-mask <i>netmask</i>	Specify the subnet masks.
-gate <i>gateway</i>	Specify individual default gateways.
-nego auto 10mh 10mf 100mh 100mf	Specify the negotiations. auto : The disk array unit makes the decision automatically. 10mh : 10 Mbps/Half 10mf : 10 Mbps/Full 100mh: 100 Mbps/Half 100mf: 100 Mbps/Full
-dhcp enable disable	Specify whether to set the DHCP mode to enable or disable.
-mipchg	Specify this option when changing the IP addresses of maintenance port automatically.
-mipchgmode enable disable	Specify whether to set the Maintenance Port IP Address Automatic Change Mode to enable or disable. enable : Enables the Maintenance Port IP Address Automatic Change Mode. disable: Disables the Maintenance Port IP Address Automatic Change Mode.

Examples

The following example displays the LAN information of an array 9500a1.

```
% aulan -unit 9500a1 -refer
Password:
CTL IP Address  Subnet mask  Default Gateway Ethernet address DHCP
0 125.0.9.98  255.255.255.0  125.0.9.15    00:00:87:50:78:AF OFF
1 125.0.9.99  255.255.255.0  125.0.9.15    00:00:87:50:78:9F OFF
%
```

The following example sets LAN information for the Controller 0 side of an array 9500a1.

```
% aulan -unit 9500a1 -set -ctl0
-addr 192.168.100.100 -mask 255.255.255.0 -gate 192.168.100.5
Password:
Are you sure you want to set the LAN information? (y/n[n]): y
```

In order to complete the setting, it is necessary to reboot the subsystem.
 When not restarting, the setting will be registered, but it will not become effective on the subsystem.
 Do you restart the subsystem? (y/n [n]): y
 Host will be unable to access the subsystem while restarting.
 Host applications that use the subsystem will terminate abnormally. Please stop host access before you restart the subsystem.
 Also, if you are logging in, the login status will be canceled when restarting begins.
 Do you agree with restarting? (y/n[n]): y
 Are you sure you want to execute? (y/n [n]): y
 Now restarting the subsystem. Start Time hh:mm:ss Time Required 4 - 15min.
 The subsystem restarted successfully.
 %



NOTE: To validate the LAN information, restart the array. The previous settings remain valid until restarting. The array cannot access the host until the reboot is completed and the system restarts. Therefore, verify that the host has stopped accessing data before beginning the restart process.

If LAN configuration information is modified, an error message (Interface Error) may appear without displaying a restart completion message when restarting is initiated. When an error message is displayed after the LAN configuration information is modified and a restarting is directed to be done, execute the `auunitchg` command. Make a change in the information that has been registered.

It may take time for an array to respond, depending on the condition of the array. If the array does not respond after 15 minutes, check the condition of the array.

Referencing/setting the port option

Command name

`auportop`

Format

9500V, AMS, WMS, SMS, AMS2000, HUS
`auportop -unit unit_name --refer`

9500V
`auportop -unit unit_name --set`
`-PortTypeOption ctl no port no`
`ResetLipSignal | ResetLipProcess |`
`LipPortAllReset | ReadFrameMin128`
`enable | disable`

AMS, WMS
`auportop -unit unit_name --set`
`-PortTypeOption ctl no port no`
`ResetLipSignal | ResetLipProcess |`
`LipPortAllReset | CrossCt1IO | CmdUniqueResponse`
`enable | disable`

SMS
`auportop -unit unit_name --set`
`-PortTypeOption ctl no port no`
`ResetLipSignal | ResetLipProcess |`
`LipPortAllReset | PLOGITimeoutPrevention |`
`DisableAutodiscoverNewHG`
`enable | disable`

```

AMS2000
auportop -unit unit_name -set
-PortTypeOption ctl_no port_no
ResetLipSignal | ResetLipProcess |
LipPortAllReset | CrossCt1IO |
CmdUniqueResponse | PLOGITimeoutPrevention |
DisableAutodiscoverNewHG | PLOGIResponseQuick
enable | disable

HUS100
auportop -unit unit_name -set
-PortTypeOption ctl_no port_no
ResetLipSignal | ResetLipProcess |
LipPortAllReset |
CmdUniqueResponse | PLOGITimeoutPrevention |
DisableSelectiveAck | AutodiscoverNewHG |
PLOGIResponseQuick | CmdQueueExpansion
enable | disable

```

Description

This command references and sets the port option.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underscore), "." (period), "@", or " " (space). Space in front and back of the character string is removed.
-refer	References the port option.
-set	Sets the port option.
-PortTypeOption <i>ctl_no port_no</i> ResetLipSignal ResetLipProcess LipPortAllReset ReadFrameMin128 CrossCtlIO CmdUniqueResponse PLOGITimeout Prevention DisableAutodiscoveryNewHG enable disable	Specifies the port type. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). ResetLipSignal : Sets ResetLip (signal). ResetLipProcess: Sets ResetLip (processing). LipPortAllReset: Sets the resetting of all ports by an LIP. ReadFrameMin128: Sets Read Frame Min 128 Byte Mode. (DF600 only) CrossCtlIO: Sets CPU Load Reduction for Cross-CTL I/O Mode. I/O Mode. (For SMS and AMS2000) CmdUniqueResponse: Sets Command Unique Response Mode. PLOGITimeoutPrevention: Sets PLOGI Timeout Prevention Mode. (For SMS and AMS2000) DisableAutodiscoveryNewHG: Sets Disable Autodiscover New HG Mode. (For SMS and AMS2000) enable : Enables the settings described above. disable : Disables the settings described above.

Example

The following example displays the port option of an array 9500a1.

```
% auportop -unit 9500a1 -refer
Password:
Port Options
Reset/LIP Mode (Signal)
Port 0A = OFF
Port 0B = OFF
Port 1A = OFF
Port 1B = OFF
Reset/LIP Mode (Process)
Port 0A = OFF
Port 0B = OFF
Port 1A = OFF
Port 1B = OFF
```

```

LIP Port All Reset Mode
Port 0A = OFF
Port 0B = OFF
Port 1A = OFF
Port 1B = OFF
Read Frame Min 128 Byte Mode
Port 0A = OFF
Port 0B = OFF
Port 1A = OFF
Port 1B = OFF
%

```

The following example sets the port option of an array 9500a1.

```

% auportop -unit 9500a1 -set -PortTypeOption 0 A ResetLipSignal enable
Password:
When setting starts, the subsystem stops accepting access to the port from the host.
Before setting, stop access to the port from the host.
Do you want to continue processing? (y/n [n]): y
%

```

The following example sets the port option of an array ams2300a1.

```

% auportop -unit 9500a1 -set -PortTypeOption 0 A ResetLipSignal enable
Password:
Are you sure you want to set the port option parameter? (y/n [n]): y
The port option parameter has been set successfully.
%

```

```

% auportop -unit ams2300a1 -refer
Port Options
Reset/LIP Mode (Signal)
Port 0A = ON
Port 0B = OFF
Port 0C = OFF
Port 0D = OFF
Port 1A = OFF
Port 1B = OFF
Port 1C = OFF
Port 1D = OFF
Reset/LIP Mode (Process)
Port 0A = OFF
Port 0B = OFF
Port 0C = OFF
Port 0D = OFF
Port 1A = OFF
Port 1B = OFF
Port 1C = OFF
Port 1D = OFF
LIP Port All Reset Mode
Port 0A = OFF
Port 0B = OFF
Port 0C = OFF
Port 0D = OFF
Port 1A = OFF
Port 1B = OFF
Port 1C = OFF
Port 1D = OFF
CPU Load Reduction for Cross-CTL I/O Mode
Port 0A = OFF
Port 0B = OFF
Port 0C = OFF
Port 0D = OFF
Port 1A = OFF
Port 1B = OFF
Port 1C = OFF
Port 1D = OFF
Command Unique Response Mode
Port 0A = OFF
Port 0B = OFF
Port 0C = OFF
Port 0D = OFF
Port 1A = OFF
Port 1B = OFF
Port 1C = OFF
Port 1D = OFF
PLOGI Timeout Prevention Mode
Port 0A = OFF
Port 0B = OFF

```

```

Port 0C = OFF
Port 0D = OFF
Port 1A = OFF
Port 1B = OFF
Port 1C = OFF
Port 1D = OFF
Disable Autodiscover New HG Mode
Port 0A = OFF
Port 0B = OFF
Port 0C = OFF
Port 0D = OFF
Port 1A = OFF
Port 1B = OFF
Port 1C = OFF
Port 1D = OFF
PLOGI Response Quick Mode
Port 0A = OFF
Port 0B = OFF
Port 0C = OFF
Port 0D = OFF
Port 1A = OFF
Port 1B = OFF
Port 1C = OFF
Port 1D = OFF
%
```

The following example displays the port option of an array unit
hus110a1.

```

% auportop -unit ams2300a1 -refer
Port Options
Reset/LIP Mode (Signal)
Port 0A = ON
Port 0B = OFF
Port 0C = OFF
Port 0D = OFF
Port 1A = OFF
Port 1B = OFF
Port 1C = OFF
Port 1D = OFF
Reset/LIP Mode (Process)
Port 0A = OFF
Port 0B = OFF
Port 0C = OFF
Port 0D = OFF
Port 1A = OFF
Port 1B = OFF
Port 1C = OFF
Port 1D = OFF
LIP Port All Reset Mode
Port 0A = OFF
Port 0B = OFF
Port 0C = OFF
Port 0D = OFF
Port 1A = OFF
Port 1B = OFF
Port 1C = OFF
Port 1D = OFF
Command Unique Response Mode
Port 0A = OFF
Port 0B = OFF
Port 0C = OFF
Port 0D = OFF
Port 1A = OFF
Port 1B = OFF
Port 1C = OFF
Port 1D = OFF
PLOGI Timeout Prevention Mode
Port 0A = OFF
Port 0B = OFF
Port 0C = OFF
Port 0D = OFF
Port 1A = OFF
Port 1B = OFF
Port 1C = OFF
Port 1D = OFF
Disable Selective Ack Mode
```

```

Port 0A = OFF
Port 0B = OFF
Port 0C = OFF
Port 0D = OFF
Port 1A = OFF
Port 1B = OFF
Port 1C = OFF
Port 1D = OFF
Autodiscover New HG Mode
Port 0A = OFF
Port 0B = OFF
Port 0C = OFF
Port 0D = OFF
Port 1A = OFF
Port 1B = OFF
Port 1C = OFF
Port 1D = OFF
PLOGI Response Quick Mode
Port 0A = OFF
Port 0B = OFF
Port 0C = OFF
Port 0D = OFF
Port 1A = OFF
Port 1B = OFF
Port 1C = OFF
Port 1D = OFF
Command Queue Expansion Mode
Port 0A = OFF
Port 0B = OFF
Port 0C = OFF
Port 0D = OFF
Port 1A = OFF
Port 1B = OFF
Port 1C = OFF
Port 1D = OFF
%
```

Referencing/setting the boot option

Command name

aubootopt

Format

```

AMS, WMS, SMS, AMS2000, HUS
aubootopt -unit unit_name --refer

AMS, WMS
aubootopt -unit unit_name --set
[ -SystemStartup      Single | Dual ]
[ -DelayPlannedShutdown time ]
[ -DriveDetach        enable | disable ]
[ -inquiryVendor      string ]
[ -inquiryProduct     string ]
[ -inquiryRomMicro    string ]
[ -inquiryRamMicro    string ]
SMS, AMS2000, HUS
aubootopt -unit unit_name --set
[ -SystemStartup      Single | Dual ]
[ -DelayPlannedShutdown time ]
[ -inquiryVendor      string ]
[ -inquiryProduct     string ]
[ -inquiryRomMicro    string ]
[ -inquiryRamMicro    string ]
```

Description

This command references or sets the boot option of the array.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " " (space). Space in front and back of the character string is removed.
-refer	References the boot option.
-set	Sets the boot option.
-SystemStartup Single Dual	Specify the configuration of an array unit. Single: Single Dual : Dual
- DelayPlannedShut down <i>time</i>	Specify the time in minutes to delay the execution of the planned shutdown when the main switch has turned off. The applicable range is from 0 to 60 minutes in unit of 1 minute. The default value is 0.
-DriveDetach enable disable	Specify whether to set the drive blockage mode effective or ineffective.
-inquiryVendor <i>string</i>	Specify the vendor name of Inquiry response information in less than or equal to 8 characters. If you want to enter NULL characters, enter "".
-inquiryProduct <i>string</i>	Specify the product type of Inquiry response information in less than or equal to 16 characters. If you want to enter NULL characters, enter "".
-inquiryRomMicro <i>string</i>	Specify the ROM microprogram version of Inquiry response information in less than or equal to 2 characters. If you want to enter NULL characters, enter ""

Example

The following example displays the boot option of an array ams500a1.

```
% aubootopt -unit ams500a1 -refer
Password:
System Startup Attribute = Dual Active Mode
Delay Planned Shutdown[min.] = 0
Drive Detach Mode = OFF
Vendor ID = HITACHI
Product ID = DF600F
ROM Microprogram Version =
RAM Microprogram Version =
%
```

Referencing/setting the time zone

Command name

autimezone

Format

```
AMS, WMS, SMS, AMS2000, HUS
autimezone -unit unit_name --refer

autimezone -unit unit_name --set
[ -timezone num ] [ -dst used | notused ]
[ -ntp1 address ] [ -ntp2 address ]

autimezone -unit unit_name -availablelist -timezone
```

Description

This command references or sets the time zone/Network Time Protocol (NTP) server.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	Displays the time zone/NTP server IP address.
-set	Sets the time zone/NTP server IP address.
-availablelist	A list of time zone numbers, each of which is eligible for the time zone is displayed.
-timezone <i>num</i>	Specify the time zone number by selecting it from the list of time zones that can be specified.
-dst used notused	Specify whether to use the daylight saving time or not. used : Use the daylight saving time. notused: Do not use the daylight saving time.
-ntp1 <i>address</i>	Specify NTP server1 IP address. To cancel the specification, enter ""
-ntp2 <i>address</i>	Specify NTP server2 IP address. To cancel the specification, enter "".
-timezone	A list of time zone numbers, each of which is eligible for the time zone is displayed.



NOTE: When the array is used to connect to the NAS, you must reboot the NNC to update the NNC time zone and set the contents of a NTP server. It is unnecessary to reboot the array.

Examples

The following example displays the time zone of an array ams500 and NTP server IP address.

```
% autimezone -unit ams500 -refer
Password:
Time Zone          : (GMT-12:00) International Date Line West
Daylight Saving Time : ---
NTP Server
  Server1 : 125.0.9.98
  Server1 : 125.0.9.99
%
```

The following example sets the NTP server IP address of an array ams500.

```
% autimezone -unit ams500 -set -ntp1 192.168.100.100
Password:
Are you sure you want to set the time zone/NTP server? (y/n [n]): y
The time zone/NTP server have been set successfully.
Restart NNC to apply the NNC setting in case that NNC is equipped.
%
```

The following example displays the eligibility for the time zone of an array ams500.

```
% autimezone -unit ams500 -availablelist -timezone
Password:
Available Time Zone
No.  DST    Time Zone
1  Disable (GMT-12:00) International Date Line West
2  Disable (GMT-11:00) Midway Island/ Samoa
3  Disable (GMT-10:00) Hawaii
4  Enable  (GMT-09:00) Alaska
5  Enable  (GMT-08:00) Pacific Time (US & Canada); Tijuana
6  Disable (GMT-07:00) Arizona
7  Enable  (GMT-07:00) Chihuahua/ La Paz/ Mazatlan
8  Enable  (GMT-07:00) Mountain Time (US & Canada)
9  Enable  (GMT-06:00) Central Time (US & Canada)
10 Disable (GMT-06:00) Central America
11 Disable (GMT-06:00) Saskatchewan
12 Enable  (GMT-06:00) Guadalajara/ Mexico City/ Monterrey
13 Enable  (GMT-05:00) Eastern Time (US & Canada)
14 Disable (GMT-05:00) Bogota/ Lima/ Quito
15 Disable (GMT-05:00) Indiana (East)
16 Enable  (GMT-04:00) Atlantic Time (Canada)
17 Enable  (GMT-04:00) Santiago
18 Disable (GMT-04:00) Caracas/ La Paz
19 Enable  (GMT-03:30) Newfoundland
20 Enable  (GMT-03:00) Brasilia
21 Disable (GMT-03:00) Buenos Aires/ Georgetown
22 Enable  (GMT-03:00) Greenland
23 Enable  (GMT-02:00) Mid-Atlantic
24 Disable (GMT-01:00) Cape Verde Is.
25 Enable  (GMT-01:00) Azores
26 Disable (GMT) Casablanca/ Monrovia
27 Enable  (GMT) Greenwich Mean Time : Dublin/ Edinburgh/ Lisbon/ London
28 Enable  (GMT+01:00) Amsterdam/ Berlin/ Bern/ Rome/ Stockholm/ Vienna
29 Enable  (GMT+01:00) Sarajevo/ Skopje/ Warsaw/ Zagreb
30 Enable  (GMT+01:00) Brussels/ Copenhagen/ Madrid/ Paris
31 Enable  (GMT+01:00) Belgrade/ Bratislava/ Budapest/ Ljubljana/ Prague
32 Disable (GMT+01:00) West Central Africa
:
%
```

The following example displays the time zone of array unit hus150 and NTP server.

```
% autimezone -unit hus150 -refer
Time Zone          : (GMT+09:00) Osaka/ Sapporo/ Tokyo
Daylight Saving time : ---
NTP Server
  Server1 : 125.0.9.98
```

```

Server2 : 125.0.9.99
NTP Server Synchronization Status
Server1  : Succeeded
Server2  : Not Executed
%
```

The following example sets the NTP server IP address of array unit hus150.

```

% autimezone -unit hus150 -set -ntp1 192.168.100.100
Are you sure you want to set the time zone/NTP server? (y/n [n]): y
The time zone/NTP server have been set successfully.
Please wait a moment and confirm the synchronization state.
%
```

Referencing/setting the IP address of the maintenance port



CAUTION! Modifying the maintenance port IP address on the Simple Modular Storage 100 system invalidates your Hitachi warranty and support. Please consult your reseller before using the CLI.

Command name

aumaintelan

Format

```

AMS, WMS, SMS, AMS2000, HUS
aumaintelan -unit unit_name --refer

AMS, WMS
aumaintelan -unit unit_name -set -addr ip_addr

SMS, AMS2000, HUS
When setting the IPv4.
    aumaintelan -unit unit_name -set -addr ip_addr
When setting the IPv6.
    aumaintelan -unit unit_name -set -ipv6_addr ipv6_addr

AMS, WMS
aumaintelan -unit unit_name --availablelist
SMS, AMS2000, HUS
aumaintelan -unit unit_name --availablelist [-ipv4] [-ipv6]
```

Description

This command references or sets the IP address of maintenance port.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " " (space). Space in front and back of the character string is removed.
-refer	Displays the IP addresses of maintenance port.
-set	Sets the IP address of maintenance port.
-availablelist	Displays a list of IP addresses that can be assigned to the maintenance port of CTL0.
-addr <i>ip_addr</i>	Specify an IP address of the CTL0. Specify the same host address as that which has been assigned. (Host address: YYY of the XXX.XXX.XXX.YYY)
-ipv6_addr <i>ipv6_addr</i>	Specify an IPv6 address of the CTL0. Specify the same address(YY part of YYYY::YYXX) as that which has been assigned.
-ipv4	Specify this option when referencing the list of IPv4 address.
-ipv6	Specify this option when referencing the list of IPv6 address.

Examples

The following example displays the IP addresses of maintenance port of an array ams500.

```
% aumaintelan -unit ams500 -refer
Password:
Maintenance Port Current Setting Result
CTL0 10.0.0.16 10.0.0.16 Normal
CTL1 10.0.0.17 10.0.0.17 Normal
NNC0 10.0.0.10 10.0.0.10 Normal
NNC2 10.0.0.12 10.0.0.12 Normal
%
```

The following example displays the available IP addresses of the maintenance port of an array ams500.

```
% aumaintelan -unit ams500 -availablelist
Password:
Available IP Address(CTL0)
10.0.0.16
192.168.0.16
192.168.233.16
172.23.211.16
10.197.181.16
%
```

The following example sets the IP addresses of the maintenance port of an array ams500.

```
% aumaintelan -unit ams500 -set -addr 192.168.233.16
Password:
The IP address of maintenance port is set up.
CTL0 : 192.168.233.16
CTL1 : 192.168.233.17
NNC0 : 192.168.233.10
NNC2 : 192.168.233.12
```

```
Are you sure? (y/n [n]): y
The IP address of maintenance port has been set successfully.
%
```

The following example displays the IP addresses of maintenance port of an array ams2300a1.

```
% aumaintelan -unit ams2300a1 -refer
CTL0
Current
IPv4
  Result      : ---
  IPv4 Address : 10.0.0.16
  IPv4 Subnet Mask : 255.255.255.0
  IPv4 Default Gateway : 0.0.0.0
IPv6
  Result      : Normal
  IPv6 Address : fe80::1f6
  Subnet Prefix Length : 64
  IPv6 Default Gateway : fe80::16
  Negotiation : Auto
  Ether Address : 11:22:33:44:55:66
Setting
IPv4
  IPv4 Address : 10.0.0.16
IPv6
  IPv6 Address : fe80::1f6
CTL1
Current
IPv4
  Result      : ---
  IPv4 Address : 10.0.0.17
  IPv4 Subnet Mask : 255.255.255.0
  IPv4 Default Gateway : 0.0.0.0
IPv6
  Result      : Normal
  IPv6 Address : fe80::1f7
  Subnet Prefix Length : 64
  IPv6 Default Gateway : fe80::17
  Negotiation : Auto
  Ether Address : 66:55:44:33:22:11
Setting
IPv4
  IPv4 Address : 10.0.0.17
IPv6
  IPv6 Address : fe80::1f7%
```

Referencing/setting LAN information online

Command name

auonlan

Format

AMS, WMS, SMS, AMS2000, HUS
 auonlan -unit unit_name -refer

AMS, WMS
 auonlan -unit unit_name -set
 [-ctl0_addr inet_addr] [-ctl0_mask netmask]
 [-ctl0_gate gateway]
 [-ctl0_nego auto | 10mh | 10mf | 100mh | 100mf]
 [-ctl1_addr inet_addr] [-ctl1_mask netmask]
 [-ctl1_gate gateway]
 [-ctl1_nego auto | 10mh | 10mf | 100mh | 100mf]
 [-mipchgmodes enable | disable]

SMS, AMS2000, HUS
 When setting the IPv4
 auonlan -unit unit_name -set
 [-mipchgmodes enable | disable]
 [-ctl0_nego auto | 10mh | 10mf | 100mh | 100mf | 1000mf]
 [-ctl1_nego auto | 10mh | 10mf | 100mh | 100mf | 1000mf]

```
[ -ctl0_dhcp enable | disable ]
[ -ctl0_addr inet_addr ] [ -ctl0_mask netmask ]
[ -ctl0_gate gateway ]
[ -ctl1_dhcp enable | disable ]
[ -ctl1_addr inet_addr ] [ -ctl1_mask netmask ]
[ -ctl1_gate gateway ]
```

When setting the IPv6

```
auonlan -unit unit_name --set
[ -ctl0_nego auto | 10mh | 10mf | 100mh | 100mf | 1000mf ]
[ -ctl1_nego auto | 10mh | 10mf | 100mh | 100mf | 1000mf ]
[ -ipv6_ctl0_setting auto | manual ]
[ -ipv6_ctl0_addr ipv6_addr ]
[ -ipv6_ctl0_prefix subnet_prefix ]
[ -ipv6_ctl0_gate ipv6_gateway ]
[ -ipv6_ctl1_setting auto | manual ]
[ -ipv6_ctl1_addr ipv6_addr ]
[ -ipv6_ctl1_prefix subnet_prefix ]
[ -ipv6_ctl1_gate ipv6_gateway ]
```

Description

This command references and sets LAN information online.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	References LAN information.
-set	Sets LAN information.
-ctl0_addr <i>inet_addr</i>	Specify the IPv4 address of Controller 0. <i>inet_addr</i> : IPv4 address
-ctl0_mask <i>netmask</i>	Specify the IPv4 subnet mask of Controller 0. <i>netmask</i> : IPv4 subnet mask
-ctl0_gate <i>gateway</i>	Specify individual IPv4 default gateway of Controller 0. <i>gateway</i> : IPv4 default gateway
-ctl0_nego auto 10mh 10mf 100mh 100mf 1000mf	Specify the negotiations of Controller 0. auto : The disk array unit makes the decision automatically. 10mh : 10 Mbps/Half 10mf : 10 Mbps/Full 100mh : 100 Mbps/Half 100mf : 100 Mbps/Full 1000mf: 1000 Mbps/Full
-ctl0_dhcp enable disable	Specify whether to set the DHCP mode of Controller 0 to enable or disable. enable : Enables the DHCP mode. disable: Disables the DHCP mode.
-ctl1_addr <i>inet_addr</i>	Specify the IPv4 address of Controller 1. <i>inet_addr</i> : IPv4 address
-ctl1_mask <i>netmask</i>	Specify the IPv4 subnet mask of Controller 1. <i>netmask</i> : IPv4 subnet mask
-ctl1_gate <i>gateway</i>	Specify individual IPv4 default gateway of Controller 1. <i>gateway</i> : IPv4 default gateway
-ctl1_nego auto 10mh 10mf 100mh 100mf 1000mf	Specify the negotiations of Controller 1. auto : The disk array unit makes the decision automatically. 10mh : 10 Mbps/Half 10mf : 10 Mbps/Full 100mh : 100 Mbps/Half 100mf : 100 Mbps/Full 1000mf: 1000 Mbps/Full

Option	Description
-ctl1_dhcp enable disable	Specify whether to set the DHCP mode of Controller 1 to enable or disable. enable : Enables the DHCP mode. disable: Disables the DHCP mode.
-mipchgmde enable disable	Specify whether to set the Maintenance Port IP Address Automatic Change Mode to enable or disable. enable : Enables the Maintenance Port IP Address Automatic Change Mode. disable: Disables the Maintenance Port IP Address Automatic Change Mode.
-ipv6_ctl0_setting auto manual	Specify the IPv6 address setting mode. auto : The disk array unit decides automatically the IPv6 address, IPv6 subnet prefix length and Pv6 default gateway. manual: Specify the IPv6 address, IPv6 subnet prefix length and IPv6 default gateway manually.
-ipv6_ctl0_addr <i>ipv6_addr</i>	Specify the IPv6 address of the Controller 0. <i>ipv6_addr</i> : IPv6 address
-ipv6_ctl0_prefix <i>ipv6_subnet_prefix</i>	Specify the IPv6 subnet prefix length of the Controller 0. <i>ipv6_subnet_prefix</i> : IPv6 subnet prefix length
-ipv6_ctl0_gate <i>ipv6_gateway</i>	Specify individual IPv6 default gateway of Controller 0. <i>ipv6_gateway</i> : IPv6 default gateway
-ipv6_ctl1_setting auto manual	Specify the IPv6 address setting mode. auto : The disk array unit decides automatically the IPv6 address, IPv6 subnet prefix length and Pv6 default gateway. manual: Specify the IPv6 address, IPv6 subnet prefix length and IPv6 default gateway manually.
-ipv6_ctl1_addr <i>ipv6_addr</i>	Specify the IPv6 address of the Controller 1. <i>ipv6_addr</i> : IPv6 address
-ipv6_ctl1_prefix <i>ipv6_subnet_prefix</i>	Specify the IPv6 subnet prefix length of the Controller 1. <i>ipv6_subnet_prefix</i> : IPv6 subnet prefix length
-ipv6_ctl1_gate <i>ipv6_gateway</i>	Specify individual IPv6 default gateway of Controller 1. <i>ipv6_gateway</i> : IPv6 default gateway

Examples

The following example displays the LAN information of an array ams500.

```
% auonlan -unit ams500 -refer
Password:
Current
CTL IP Address      Subnet Mask      Default Gateway  Result
0 125.0.9.98        255.255.255.0    125.0.9.15       Normal
1 125.0.9.99        255.255.255.0    125.0.9.15       Normal
Setting
CTL IP Address      Subnet Mask      Default Gateway
0 125.0.9.100        255.255.255.0    125.0.9.15
1 125.0.9.101        255.255.255.0    125.0.9.15
Maintenance Port IP Address Automatic Change Mode : ON
%
```

The following example sets LAN information for the Controller 0 side of an array ams500.

```
% auonlan -unit ams500 -set -ctl0_addr 192.168.100.100 -ctl0_mask 255.255.255.0
-ctl0_gate 192.168.100.5 -mipchgmode enable
Password:
Are you sure you want to set the LAN information?
(y/n [n]): y
Your maintenance LAN port will changed as follows.
CTL0 - IP:10.0.0.16 SM:255.255.255.0 GW:N/A
CTL1 - IP:10.0.0.17 SM:255.255.255.0 GW:N/A
Do you want to continue processing? (y/n [n]): y
The LAN information has been set successfully.
The subsystem cannot be connected because LAN information is changed.
When unable to connect, please update the array unit information using auunitchg
command, or confirm the LAN environment.
%
```

The following example displays the LAN information of an array ams2300a1.

```
% auonlan -unit ams2300a1 -refer
IPv4
Maintenance Port IP Address Automatic Change Mode : OFF
Current
CTL0
IPv4
Result          : ---
IPv4 Address     : 1.2.3.4
IPv4 Subnet Mask : 11.12.13.14
IPv4 Default Gateway : 21.22.23.24
IPv6
Result          : Normal
IPv6 Address     : fe80::1
Linklocal IPv6 Address : fe80::3
Subnet Prefix Length : 64
IPv6 Default Gateway : fe80::2
Negotiation      : 100Mbps/Full
Ether Address    : 00:00:00:00:00:00
CTL1
IPv4
Result          : ---
IPv4 Address     : 101.102.103.104
IPv4 Subnet Mask : 111.112.113.114
IPv4 Default Gateway : 121.122.123.124
IPv6
Result          : Normal
IPv6 Address     : fe80::11
Linklocal IPv6 Address : fe80::13
Subnet Prefix Length : 64
IPv6 Default Gateway : fe80::12
Negotiation      : 100Mbps/Half
Ether Address    : 00:00:00:00:00:00
Setting
CTL0
IPv4
DHCP             : OFF
IPv4 Address     : 51.52.53.54
```

```

IPv4 Subnet Mask      : 61.62.63.64
IPv4 Default Gateway  : 71.72.73.74
IPv6
IPv6 Address Setting Mode : MANUAL
IPv6 Address          : fe80::fe01
Subnet Prefix Length   : 64
IPv6 Default Gateway   : fe80::fe02
Negotiation : 100Mbps/Full
CTL1
IPv4
DHCP                  : OFF
IPv4 Address          : 151.152.153.154
IPv4 Subnet Mask       : 161.162.163.164
IPv4 Default Gateway   : 171.172.173.174
IPv6
IPv6 Address Setting Mode : MANUAL
IPv6 Address          : fe80::fe11
Subnet Prefix Length   : 64
IPv6 Default Gateway   : fe80::fe12
Negotiation : 100Mbps/Full
%
```

Setting up configuration

This section covers the following commands related to configuration:

- [Referencing/setting the Fibre Channel information on page 3-129](#)
- [Referencing/setting the spare HDU on page 3-131](#)
- [Referencing/setting the fee-basis option on page 3-133](#)
- [Referencing/setting the drive restoration control information on page 3-136](#)
- [Referencing/setting the online verify information on page 3-139](#)
- [Referencing/setting the command device information on page 3-141](#)
- [Rebooting on page 3-143](#)
- [Referencing/setting volume pre-fetch information on page 3-144](#)
- [Referencing/splitting the Hi-Copy Pair information on page 3-145](#)
- [Referencing/setting the DMLU information on page 3-146](#)
- [Referencing/setting the iSCSI port information on page 3-147](#)
- [Referencing/setting the CHAP user information on page 3-153](#)
- [Referencing/sending a ping on page 3-156](#)
- [Referencing/setting the backend diagnosis information on page 3-157](#)
- [Setting the SNMP environment information and outputting its file on page 3-158](#)
- [Referencing/setting e-Mail alert information on page 3-159](#)
- [Referencing/setting the LED information on page 3-161](#)
- [Referencing/Starting additional unit information on page 3-163](#)
- [Referencing/setting LAN port information on page 3-163](#)
- [Setting the SSL option on page 3-167](#)

Observe the following guidelines:

- When the AMS/WMS array is used to connect to the NAS, restarting the array stops the cluster between the NAS units and restarts the array. When restarting the array unfavorably, stop the cluster between the NAS units and then restart the array. Thereafter, start the cluster between the NAS units again.
- If you restart the array after issuing a power down instruction but before power down completes when the Powers Savings feature is used, the power down may fail because the array receives a command from a host immediately after the array restarts. If the power down fails, perform the power down again. Check that the power down instruction has not been issued or has been completed (no RAID in the Power Saving Status of **Normal (Command Monitoring)** exists) before restarting the array.

The following message appears when the LAN information is set. It accesses the user port and the maintenance port of the controller to be set with Web:

DMEA0011BD: The process cannot be performed because the User LAN port of array is being used by other applications. Refer to [netstat.inf] file in the directory where Storage Navigator Modular 2 is installed, close applications using User LAN port of array, and then try again.

- The usage condition of the LAN port is output to netstat.inf. In the netstat.inf file,
 - “Local address” refers to the IP address of the controller.
 - “Foreign Address” refers to the IP address of PC connecting with the array.
 - “State” refers to the status of the TCP connection. Regardless of “Status” in the netstat.inf file, stop all applications connecting from “Foreign address” and execute it again.

Referencing/setting the Fibre Channel information

Command name

aufibre1

Format

```
9500V, AMS, WMS, SMS, AMS2000, HUS
aufibre1 -unit unit_name --refer

9500V
aufibre1 -unit unit_name --set
[ -topo    ctl_no port_no loop | ptop ]
[ -rate    ctl_no port_no 1 | 2 | 4 | auto ]
[ -portaddr ctl_no port_no port_address ]

AMS, WMS
aufibre1 -unit unit_name --set
[ -topo    ctl_no port_no loop | ptop ]
[ -rate    ctl_no port_no 1 | 2 | 4 | auto ]
[ -portaddr ctl_no port_no port_address ]

SMS, AMS2000
aufibre1 -unit unit_name --set
[ -topo    ctl_no port_no loop | ptop ]
[ -rate    ctl_no port_no 1 | 2 | 4 | 8 | auto ]
[ -portaddr ctl_no port_no port_address ]

HUS
aufibre1 -unit unit_name --set
[ -topo    ctl_no port_no loop | ptop ]
[ -rate    ctl_no port_no 2 | 4 | 8 | auto ]
[ -portaddr ctl_no port_no port_address ]
```

Description

This command references or sets the fibre channel information.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	Displays fibre channel information.
-set	Sets fibre channel information.
-topo <i>ctl_no</i> <i>port_no</i> loop ptop	Specify the topology of the specified port. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H) loop : Loop ptop : Point-to-Point
-rate <i>ctl_no</i> <i>port_no</i> 1 2 4 8 auto	Specify the fibre channel transfer rate of the specified port. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H) 1 : 1 (G bps) 2 : 2 (G bps) 4 : 4 (G bps)(AMS, WMS, SMS, and AMS2000) 8 : 8 (G bps)(SMS and AMS2000) auto : The fibre channel transfer rate will be automatically defined by the array unit.
-portaddr <i>ctl_no</i> <i>port_no</i> <i>port-</i> <i>address</i>	Specify the port address of the specified port. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H) <i>port-address</i> : Port address (6 hexadecimal characters)

Examples

The following example displays the fibre channel information of an array ams500a1.

```
% aufibre1 -unit ams500a1 -refer
Password:
Port Information
          Port Address
CTL Port Node Name Port Name Setting Current
0 A 50060E8010200120 50060E8010200120 0000E8 000000
0 B 50060E8010200121 50060E8010200121 0000E8 000000
1 A 50060E8010200122 50060E8010200122 0000E8 000000
1 B 50060E8010200123 50060E8010200123 0000E8 000000

Transfer Rate
CTL Port Setting Current
0 A 2Gbps 2Gbps
0 B 2Gbps 2Gbps
1 A 2Gbps 2Gbps
1 B 2Gbps 2Gbps

Topology Information
CTL Port Topology
0 A Point to Point
0 B Point to Point
1 A Point to Point
```

```

1 B Point to Point

Link Status
CTL Port Status
0 A Link Failure
0 B Link Failure
1 A Link Failure
1 B Link Failure
%
```

The following example sets the topology of Port A of controller 0 of an array name `ams500a1` to loop.

```

% aufibre1 -unit ams500a1 -set -topo 0 A loop
Password:
Are you sure you want to set the fibre channel information?
(y/n [n]): y
When setting starts, the subsystem stops accepting access to the port from the host.
Before setting, stop access to the port from the host.
Do you want to continue processing? (y/n [n]): y
The fibre channel information has been set successfully.
%
```

Referencing/setting the spare HDU



CAUTION! Modifying the spare HDU on the Simple Modular Storage 100 system invalidates your Hitachi warranty and support. Please consult your reseller before using the CLI.

Command name

`auspare`

Format

```

9500V
auspare -unit unit_name -set -uno unit_no -hno hdu_no

auspare -unit unit_name -rm -uno unit_no -hno hdu_no

AMS, WMS, AMS2000, HUS
auspare -unit unit_name -refer

auspare -unit unit_name -set -drive unit_no.hdu_no ...
auspare -unit unit_name -rm -drive unit_no.hdu_no ...

auspare -unit unit_name -availablelist
```

Description

This command references or sets a spare HDU. It is necessary to assign a spare drive to the maximum drive capacity in an array.

HDUs that can be set to a spare drive are data disk drives, for which a RAID is not yet defined, excluding HDUs 0 to 4 in Unit 0. (9500V).

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	References the spare HDU.
-set	Sets up the spare HDU.
-rm	Cancels the spare HDU.
-availablelist	A list of drives, each of which is eligible for a spare HDU is displayed.
-uno <i>unit_no</i>	Specify the unit number of the spare HDU.
-hno <i>hdu_no</i>	Specify the HDU number of the spare HDU.
-drive <i>unit_no.hdu_no ...</i>	Specify the Unit number and HDU number punctuating them with a period to be set or canceled. Single or multiple drive numbers can be specified. <i>unit_no</i> : Unit number <i>hdu_no</i> : HDU number Single specification: Specifying a single drive number. Example: -drive 1.0 Multiple specification: Specifying multiple drives numbers. Example: -drive 1.0 2.3 3.1 -drive 1.0-2.2 2.8

Examples

The following example lists drives, each of which is eligible for a spare HDU of an array ams500a1.

```
% auspare -unit ams500a1 -availablelist
Password:
Available Drives
Unit HDU Capacity Drive Type Status
  1  13 146GB   FC      Undefined
  1  14 146GB   FC      Undefined
%
```

The following example sets the HDU in Unit number 1 position 14 as the spare HDU of an array ams500a1.

```
% auspare -unit ams500a1 -set -drive 1.14
Password:
Are you sure you want to set the spare drive? (y/n[n]): y
The drive of the unit number 1 and the HDU number 14 was set as a spare.
The spare drives have been set successfully.
%
```

The following example displays the setting of the spare HDU in an array ams500a1 by using the auspare command. Spare HDUs will be indicated as “Spare” in “Type” column.

```
% auspare -unit ams500a1 -refer
Password:
Unit HDU Type Capacity Drive Type Status Vendor
Product Revision Serial No.
1 14 Spare 146GB FC Standby SEAGATE
DKS2C-J146FC xxxx 3HYxxxxx
%
```

Referencing/setting the fee-basis option

Command name

auopt

Format

```
9500V, AMS, WMS, SMS, AMS2000, HUS
auopt -unit unit_name -refer

When locking off the fee-basis option
9500V
auopt -unit unit_name -lock off -keycode key_code
auopt -unit unit_name -lock off -licensefile license_file_path
AMS, WMS
auopt -unit unit_name -lock off -keycode key_code
auopt -unit unit_name -lock off -licensefile license_file_path
SMS, AMS2000, HUS
auopt -unit unit_name -lock off -keycode key_code
auopt -unit unit_name -lock off -licensefile license_file_path [ -all ]
When locking on the fee-basis option
9500V, AMS, WMS, SMS, AMS2000, HUS
auopt -unit unit_name -lock on -keycode key_code
AMS2000, HUS
auopt -unit unit_name -reconfigurememory start | cancel
```

Description

This command locks or unlocks the specified fee-basis option. Unlocking or locking can be carried out by the key code or the license key file which is attached to the option facility. The fee-basis option can be enabled or disabled after it is unlocked (installed). This command starts or cancels the memory reconfiguring of fee-basis option.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " " (space). Space in front and back of the character string is removed.
-lock off on	Specify the fee-basis option to be unlocked (installed) or unlocked (de-installed). off: Unlocks (installs) the fee-basis option. on : Locks (de-installs) the fee-basis option.
-keycode <i>key_code</i>	Specify the key code when unlocking or locking the fee-basis option.
-licensefile <i>license_file_path</i>	Specify the path of the license key file when unlocking the fee-basis option. <i>license_file_path</i> : The path of the license key file
-all	Specify this option when unlocking (installing) all fee-basis options at license key file.
-option <i>option-name</i>	Specify the name of the fee-basis option when enabling or disabling the use of unlocked fee-basis option. For the name of the option, refer to the manual for each fee-basis option.
-st enable disable	Specify whether to set the fee-basis option effective or ineffective. enable : Enables the use of the fee-basis option. disable: Disables the use of the fee-basis option.

Examples

The following example displays the status of unlocked (installed) fee-basis option of an array `ams500a1`.

```
% auopt -unit ams500a1 -refer
Password:
Option Name                Type   Term   Status
Reconfigure Memory Status
SNMP-AGENT                 Permanent ---   Enable
N/A
```

```
%
```

The following example installs the LUN Manager fee-basis option that does not require rebooting an array `ams500a1` by using the license key file.

```
% auopt -unit ams500a1 -lock off -licensefile d:\xxxxxxx.xxx
Password:
No. Option Name
1 LUN-MANAGER
Please specify the number of the option to unlock.
When you unlock the two or more options, partition the numbers, which are given
in the list, with the space(s). When you unlock all options, input 'all'. Input
```

```
'q', then break.  
The number of the option to unlock. (number/all/q[all]): 1  
Are you sure you want to unlock the option?  
(y/n [n]): y
```

Option Name	Result
LUN-MANAGER	Unlock

```
The process was completed.  
%
```

The following example starts the memory reconfiguring an array unit
ams2300a1.

```
% auopt -unit ams2300a1 -reconfigurememory start  
Are you sure you want to start reconfigure memory? (y/n [n]): y  
While in progress, performance degradation of host I/Os to the array will occur.  
  
Are you sure you want to continue? (y/n [n]): y  
Memory configuring starts successfully.  
%
```

Referencing/setting the drive restoration control information



CAUTION! Modifying the drive restoration control information on the Simple Modular Storage 100 system invalidates your Hitachi warranty and support. Please consult your reseller before using the CLI.

Command name

audrecopt

Format

```
9500V, AMS, WMS, SMS, AMS2000, HUS
audrecopt -unit unit_name -refer

9500V
audrecopt -unit unit_name -set
[ -restor back | normal | priority ] [ -auto enable | disable ]
[ -sparing rw | rw | not ] [ -interval interval_time ]
[ -size n ]
AMS, WMS
audrecopt -unit unit_name -set
[ -restor back | normal | priority ] [ -auto enable | disable ]
[ -sparing rw | rw | not ] [ -interval interval_time ]
[ -size n ]
[ -spare variable | fixed ]
[ -allunitnocopyback enable | disable ]
SMS, AMS2000, HUS
audrecopt -unit unit_name -set
[ -restor back | normal | priority ] [ -auto enable | disable ]
[ -sparing rw | rw | not ] [ -interval interval_time ]
[ -size n ]
[ -spare variable | fixed ]
```

Description

This command references and sets the drive restoration control information.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	References the drive restoration control information.
-set	Sets the drive restoration control information.
-restor back normal priority	Specify the drive restoration mode. back : Executes restoration during the interval of the host command process. normal : Prioritizes the command from the host and executes restoration every certain interval after the host command terminates. priority: Executes restoration every certain interval with higher priority than that of the command from the host.
-auto enable disable	Specify whether or not to automatically start the copy from the spare drive (copy-back).
-sparing rwv rw not	Specify the operating mode of dynamic sparing. rwv: When the count of either the Read/Write error or the online verify error exceeds a predetermined threshold value, the dynamic sparing starts. rw : When the count of Read/Write error exceeds a predetermined threshold value, the dynamic sparing starts. not: The dynamic sparing will not start even if the count of Read/Write error or online verify error exceeded a predetermined threshold value.
-interval <i>interval_time</i>	Specify the interval of executing restoration. Specify the time using a value from 0 to 255 in units of 10 ms. The default value is 10, which executes restoration at an interval of every 100 ms
-size <i>n</i>	Specify the unit of restored data per single operation in the restoration process. Specify a value of a multiple of 32 between 32 and 65,504 in units of 512 bytes. The default value is 32, which restores 16 k bytes data in a single operation. However, when the firmware revision of 9500V is x6x5 or later or AMS or WMS, the value of the range of 128 to 65408 is specified by the multiple of 128. When specifying 128, which restores 64 k byte data in a single operation.
-spare variable fixed	Specify the operating mode of spare drive. variable: Active spare mode (Non-copyback) fixed : Fixed spare mode (Copyback)

Option	Description
-allunitnocopyback enable disable	Specify whether to set the Applying No Copy Back Mode on All the Units effective or ineffective. enable : Enables the Applying No Copy Back Mode on All the Units. disable: Disables the Applying No Copy Back Mode on All the Units.

Examples

The following example displays the drive restoration control information of an array 9500a1.

```
% audrecopt -unit 9500a1 -refer
Password:
Drive Restoration Mode      : Interleave(Normal)
Drive Restoration          : Automatically
Dynamic Sparing            : Executing(Read/Write & Online Verify)
Interval Time [10ms]       : 0
Processing Unit Size [blocks] : 128
%
```

The following example sets the drive restoration control information for an array 9500a1.

```
% audrecopt -unit 9500a1 -set -restor normal
Password:
%
```

The following example displays the drive restoration control information of an array ams500a1.

```
% audrecopt -unit ams500a1 -refer
Password:
Drive Restoration Mode      : Interleave(Normal)
Drive Restoration          : Automatically
Dynamic Sparing            : Executing(Read/Write & Online Verify)
Interval Time [10ms]       : 0
Processing Unit Size [blocks] : 128
Spare Drive Operation Mode  : Variable
Applying No Copy Back Mode on All the Units : Disable
%
```



NOTE: Even if the Spare Drive Operation Mode is set to Variable, it becomes operation of Fixed in SMS100.

Referencing/setting the online verify information



CAUTION! : Modifying the online verification information on the Simple Modular Storage 100 system invalidates your Hitachi warranty and support. Please consult your reseller before using the CLI.

Command name

auonlineverify

Format

9500V, AMS, WMS, SMS, AMS2000, HUS
auonlineverify -unit unit_name -refer

9500V, SMS
auonlineverify -unit unit_name -set
 [-verify enable | disable]
 [-skipverify on | off]
AMS, WMS, AMS2000, HUS
auonlineverify -unit unit_name -set
 [-verify enable | disable]
 [-skipverify on | off]
 [-cacheverify on | off]

Description

This command references and sets the online verify information.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " " (space). Space in front and back of the character string is removed.
-refer	References the online verify information.
-set	Sets the online verify information.
-verify enable disable	Specify whether or not to perform an online verify test. enable : Executes online verify test. disable: Does not execute online verify test.
-skipverify on off	Specify whether or not to perform an online verify test. enable : Executes online verify test. disable: Does not execute online verify test.
-cacheverify on off	Specify whether to set the cache verify effective or ineffective. on : Enables the cache verify. off: Disables the cache verify.

Examples

The following example displays the online verify information of an array `ams500a1`.

```
% auonlineverify -unit ams500a1 -refer
Password:
Online Verify Test : No
Skip Online Verify : ON
Cache Verify      : ON
%
```

The following example sets the online verify information to an array `ams500a1`, then displays the information.

```
% auonlineverify -unit ams500a1 -set -verify enable
Password:
Are you sure you want to set the online verify information? (y/n [n]): y
The online verify information has been set successfully.
%
% auonlineverify -unit ams500a1 -refer
Password:
Online Verify Test : Yes
Skip Online Verify : ON
Cache Verify      : ON
%
```

Referencing/setting the command device information

Command name

aucmddev

Format

```
9500V, AMS, WMS, SMS, AMS2000, HUS
aucmddev -unit unit_name --refer

aucmddev -unit unit_name -set -dev n lu [ enable | disable ]
        [ -dev n lu [ enable | disable ] ] ...

aucmddev -unit unit_name -chg -dev n lu enable | disable
        [ -dev n lu enable | disable ] ...

aucmddev -unit unit_name -rm -dev n [ -dev n ] ...

AMS, WMS, SMS, AMS2000, HUS
aucmddev -unit unit_name -availablelist
```

Description

This command references and sets the command device.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " " (space). Space in front and back of the character string is removed.
-refer	References the command device and the serial ID.
-set	Sets the command device and the serial ID.
-rm	Deletes the command device.
-chg	Changes the protection function of RAID Manager (CCI).
-availablelist	A list of logical unit numbers, each of which is eligible for the command device is displayed.
-dev <i>n lu</i> [enable disable]	Specify the parameter of the command device. When the specification of enable or disable is omitted, the protection function of RAID Manager (CCI) set ineffective. <i>n</i> : Command device number (1 or 2). <i>lu</i> : Logical unit number. enable : Enables the protection function of RAID Manager (CCI). disable: Disables the protection function of RAID Manager (CCI).
-dev <i>n</i>	Specify the command device number to be deleted. <i>n</i> : Command device number (1 or 2).

Examples

The following example displays command device set-up information for an array 9500a1.

```
% aucmddev -unit 9500a1 -refer
Password:
Command device  LUN  RAID Manager Protect
      1      1  Disable
      2     10  Disable
%
```

The following example sets up an array 9500a1 as command device 1, with its logical number set to 0.

```
% aucmddev -unit 9500a1 -set -dev 1 0
Password:
%
```

Rebooting

Command name

aureboot

Format

When rebooting after a shutdown.
9500V, AMS, WMS, SMS, AMS2000, HUS
aureboot -unit unit_name
When performing only a shutdown and not rebooting.
SMS, AMS2000, HUS
aureboot -unit unit_name -onlyshutdown

Description

This command reboots the array after a shutdown.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period), “@”, or “ (space)”. Space in front and back of the character string is removed.
-onlyshutdown	Only a shutdown is performed. A reboot is not performed.

Examples

The following example reboots an array 9500a1.

```
% aureboot -unit 9500a1
Password:
Do you want to restart the subsystem? (y/n [n]): y
Host will be unable to access the subsystem while restarting. Host applications
that use the subsystem will terminate abnormally. Please stop host access before
you restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting b
egins.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute?
(y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 4 - 15min.
The subsystem restarted successfully.
%
```

The following example reboots an array 9500a1 whose status is stopping under pseudo-plan.

```
% aureboot -unit 9500a1
Password:
The subsystem has stopped under pseudo-plan.
Do you want to restart the subsystem? (y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 4 - 15min.
The subsystem restarted successfully.
%
```

Referencing/setting volume pre-fetch information

Command name

```
aulupre
```

Format

```
9500V
aulupre -unit unit_name --refer

aulupre -unit unit_name -lu lun -stag num | default
```

Description

This command references or sets the logical unit pre-fetch information.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	Displays the LU pre-fetch information.
-lu <i>lun</i>	Specify the LU number of an LU whose pre-fetch information is to be set.
-stag <i>num</i> default	Specify the pre-fetch staging size. num : Specify the number of sub blocks.(1 to 65535) default: Sets the default size.

Examples

The following example displays the logical unit pre-fetch information for an array 9500a1.

```
% aulupre -unit 9500a1 -refer
Password:
LUN   Staging Size
0      512
1      512
%
```

The following example sets the logical unit 0 pre-fetch information for an array 9500a1.

```
% aulupre -unit 9500a1 -lu 0 -stag 512
Password:
%
```

Referencing/splitting the Hi-Copy Pair information

Command name

auhicopy

Format

```
9500V
auhicopy -unit unit_name -refer [-lu lun ...]

auhicopy -unit unit_name -split -lu lun
```

Description

This command references or splits the Hi-Copy pair information.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	Displays the Hi-Copy pair information.
-split	Splits the Hi-Copy pair.
-lu <i>lun ...</i>	Specify the LU numbers to reference the Hi-Copy pair information. When doing that, enter the LU number using numerals or a hyphen(s) (-). If the specification is omitted, all the pair information is displayed. Single or multiple LU numbers can be specified. Single specification : Specifying a single LU number. Example: -lu 3 Multiple specification: Specifying multiple LU numbers. Example: -lu 0 1 2 3 4 5 8 -lu 0-5 8
-lu <i>lun</i>	Specify the LU number to split the Hi-Copy pair.

Examples

The following example displays the Hi-Copy pair information for an array 9500a1.

```
% auhicopy -unit 9500a1 -refer
Pair      Rate of   Remote Information
LUN Attribute Status Difference Type      Serial No.  LDEV No.
100 S-VOL   RD    ---    0450      22222222  0001
200 P-VOL   R/W   60%    0450      11111111  021F
300 S-VOL   ERR   30%    0450      01234567  FFFF
%
```

The following example releases the Hi-Copy pair with which LU 100 is connected in an array 9500a1.

```
% auhicopy -unit 9500a1 -split -lu 100
Password:
Are you sure you want to split the pair of logical unit 100?
(y/n [n]): y
If you split the pair, all the area of LU will be copied when you create it again. Do you want to
continue processing?
(y/n [n]): y
The pair of logical unit has been successfully split.
%
```

Referencing/setting the DMLU information



CAUTION! Modifying the differential management logical unit information on the Simple Modular Storage 100 system invalidates your Hitachi warranty and support. Please consult your reseller before using the CLI.

Command name

audmlu

Format

```
AMS, WMS, AMS2000, HUS
audmlu -unit unit_name -refer

audmlu -unit unit_name -set -lu lun

audmlu -unit unit_name -rm -lu lun

audmlu -unit unit_name -availablelist
```

Description

This command references or sets the DM-LU information.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and back of the character string is removed.
-refer	Displays the DM-LU information.
-set	Sets the DM-LU information.
-rm	Deletes the DM-LU information.
-availablelist	A list of logical unit numbers, each of which is eligible for the DM-LU is displayed.
-lu <i>lun</i>	Specify the LU number of an LU whose DM-LU information is to be set or deleted.

Example

The following example displays the DM-LU information for an array ams500a1.

```
% audmlu -unit ams500a1 -refer
Password:
  LUN Capacity RAID Group RAID Level D-CTL C-CTL Type Status
    0 5.0 Gbyte      0   5(4D+1P)   0   0 FC   Normal
%
```

Referencing/setting the iSCSI port information

Command name

auiscsi

Format

AMS, WMS, SMS, AMS2000, HUS100
auiscsi -unit *unit_name* -refer

AMS, WMS, SMS
auiscsi -unit *unit_name* -set *ctl_no* *port_no*
[-addr *inet_addr*]
[-mask *netmask*]
[-gate *gateway*]
[-portnum *port_num*]
[-timer *time*]

AMS2000
auiscsi -unit *unit_name* -set *ctl_no* *port_no*
[-addr *inet_addr*]
[-mask *netmask*]
[-gate *gateway*]
[-portnum *port_num*]
[-timer *time*]
[-mtu 1500 | 4500 | 9000]
[-headerdigest enable | disable]
[-datadigest enable | disable]
[-delayedack enable | disable]

HUS 100
auiscsi -unit *unit_name* -set *ctl_no* *port_no* -ipv6_status enable | disable

When IPv6 status is set as disable

```

auiiscsi -unit unit_name -set ctl_no port_no
[ -addr inet_addr ]
[ -mask netmask ]
[ -gate gateway ]
[ -portnum port_num ]
[ -timer time ]
[ -mtu 1500 | 4500 | 9000 ]
[ -vlan enable | disable ]
[ -vlanid vlan_id ]
[ -headerdigest enable | disable ]
[ -datadigest enable | disable ]
[ -windowsscale enable | disable ]
[ -delayedack enable | disable ]

```

When IPv6 status is set as enable.

```

auiiscsi -unit unit_name -set ctl_no port_no
[ -addr inet_addr ]
[ -mask netmask ]
[ -gate gateway ]
[ -ipv6_link_local_type auto | manual ]
[ -ipv6_link_local_addr ipv6_local_addr ]
[ -ipv6_global_addr_type auto | manual ]
[ -ipv6_global_addr1 ipv6_addr ]
[ -ipv6_global_addr2 ipv6_addr ]
[ -ipv6_gate ipv6_gateway ]
[ -portnum port_num ]
[ -timer time ]
[ -mtu 1500 | 4500 | 9000 ]
[ -vlan enable | disable ]
[ -vlanid vlan_id ]
[ -headerdigest enable | disable ]
[ -datadigest enable | disable ]
[ -windowsscale enable | disable ]
[ -delayedack enable | disable ]

```

Description

This command references or sets the iSCSI port information.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and back of the character string is removed.
-refer	References the iSCSI port information.
-set <i>ctl_no port_no</i>	Sets the iSCSI port information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-addr <i>inet_addr</i>	Specify the IP address. <i>inet_addr</i> : IP address
-mask <i>netmask</i>	Specify the subnet mask. <i>netmask</i> : Subnet mask
-gate <i>gateway</i>	Specify individual default gateway. <i>gateway</i> : Default gateway
-portnum <i>port_num</i>	Specify the port number for TCP/IP communication. <i>port_num</i> : Port number
-timer <i>time</i>	Specify the Keep Alive Timer. <i>time</i> : Keep Alive Timer (second)
-mtu 1500 4500 9000	Specify the MTU.

Examples

The following example displays the iSCSI port information for an array ams500.

```
% aiscsi -unit ams500 -refer
Password:
LAN Information
Port 0A
IP Address       : 125.0.9.98
Subnet Mask      : 255.255.255.0
Default Gateway  : 0.0.0.0
Port Number      : 3260
Keep Alive Timer [sec.] : 60
MTU              : 1500
Ethernet Address  : 00:07:E9:E3:DD:CE
Result           : Normal
Port 0B
:
%
```

The following example sets the iSCSI port information for port 0B of an array ams500.

```
% aiscsi -unit ams500 -set 0 B -addr 125.1.9.98
Password:
Are you sure you want to set the iSCSI port information?
```

```
(y/n [n]): y
When setting except Keep Alive Timer starts, the subsystem stops access to all ports on the controller side with setting port from the host.
Before setting, stop access to all ports on the controller side with setting port from the host.
Do you want to continue processing? (y/n [n]): y
The iSCSI port information has been set successfully.
%
```

The following example displays the iSCSI port information for an array `ams2300a1`.

```
% aiscsi -unit ams2300a1 -refer
Port 0A
Port Number      :      3260
Keep Alive Timer[sec.] :      60
MTU              :      1500
Transfer Rate    :      10bps
Link Status      :      Link Up
Ether Address    :      00:01:02:03:04:05
IPv4
  IPv4 Address    :      100.101.102.103
  IPv4 Subnet Mask :      255.255.255.0
  IPv4 Default Gateway :      150.151.152.153
Connecting Hosts  :      10000
Result           :      Setting

Port 0B
:
:
%
```

The following example displays the iSCSI port information for an array unit `hus110a1`.

```
% aiscsi -unit hus110a1 -refer
Port 0A
Port Number      :      3260
Keep Alive Timer[sec.] :      60
MTU              :      1500
Transfer Rate    :      1Gbps
Link Status      :      Link Up
Ether Address    :      00:01:02:03:04:05
IPv4
  IPv4 Address    :      100.101.102.103
  IPv4 Subnet Mask :      255.255.255.0
  IPv4 Default Gateway :      150.151.152.153
IPv6 Status      :      Enable
IPv6
  Link Local IP Address
    Address Type   :      Manual
    IP Address     :      fe80::2022
    Address Status  :      ---
  Global IP Address
    Address Type   :      Manual
    IP Address 1   :      2080::2022
    Address Status  :      ---
    IP Address 2   :      2081::2022
    Address Status  :      ---
  Subnet Prefix Length :      22
  Default Gateway
    IP Address
      Current      :      3034::2022
      Setting      :      3033::2022
    Address Status  :      Unconfigured
    Link MTU       :      1500
Connecting Hosts   :      10000
Result             :      Setting
VLAN Status        :      Enable
VLAN ID            :      22
Header Digest      :      Enable
Data Digest        :      Enable
Windows Scale      :      Enable
Delayed Ack        :      Enable
```

```
Port 0B
:
%
```

The following example sets the Windows Scale for port 0A of an array unit hus110a1.

```
% aiscsi -unit hus110a1 -set 0 A window scale enable
Are you sure you want to set the iSCSI port information? (y/n [n]): y
When setting except Keep Alive Timer starts, the subsystem stops access to all ports on the
controller side with setting port from the host.
Before setting, stop access to all ports on the controller side with setting port from the host.
Do you want to continue processing? (y/n [n]): y
The iSCSI port information has been set successfully.
%
```

Referencing/setting the iSNS information

Command name

auisns

Format

```
AMS, WMS, SMS, AMS2000, HUS
auisns -unit unit_name -refer

auisns -unit unit_name -set ctl_no port_no
      [-server used | notused]
      [-addr inet_addr]
      [-portnum port_num]
```

Description

This command references or sets the iSNS information.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	References the iSNS information. Sets the iSNS information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-server used notused	Specify whether to use the iSNS server or not. used : Use the iSNS server. notused: Does not use the iSNS server.
-addr <i>inet_addr</i>	Specify the IP address. <i>inet_addr</i> : IP address
-portnum <i>port_num</i>	Specify the port number for TCP/IP communication. <i>port_num</i> : Port number

The following example displays the iSNS information for an array ams500.

```
% auisns -unit ams500 -refer
Password:
Port 0A
  Server Use: Used
  IP Address: 192.168.10.15
  Port Number: 3205
Port 0B
  :
%
```

Referencing/setting the CHAP user information

Command name

auchapuser

Format

AMS, WMS, SMS, AMS2000
auchapuser -unit unit_name -refer
[ctl_no port_no [-user user_name | -userfile file_name]]

auchapuser -unit unit_name -add ctl_no port_no
-user user_name | -userfile file_name
[-tno target_no ... | -talias target_alias ...]

auchapuser -unit unit_name -chg ctl_no port_no
-user user_name | -userfile file_name
[-newuser new_user_name | -newuserfile file_name]
[-secret]

auchapuser -unit unit_name -rm ctl_no port_no
-user user_name | -userfile file_name

auchapuser -unit unit_name -assign ctl_no port_no
-user user_name | -userfile file_name
-tno target_no ... | -talias target_alias ...

auchapuser -unit unit_name -release ctl_no port_no
-user user_name | -userfile file_name
-tno target_no ... | -talias target_alias ... | -all

auchapuser -unit unit_name -availablelist ctl_no port_no
-user user_name | -userfile file_name

Description

This command references or sets CHAP user information.



NOTE: At the Windows[®] 98 MS-DOS prompt, the input buffer is up to 128 characters by default. Use the option **-userfile** or **-newuserfile** when a long CHAP User name is specified. The first line of the specified file is set for CHAP User name, and the second line and the following are invalid.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer [<i>ctl_no</i> <i>port_no</i>]	References CHAP user information. CHAP user information list is sorted by the CHAP user name. When the <i>ctl_no</i> <i>port_no</i> is not specified: CHAP user name of the all ports is displayed. When the <i>ctl_no</i> <i>port_no</i> is specified: CHAP user name of the specified port is displayed. When the -user or -userfile option specified, the target that has been assigned to the specified CHAP user is also displayed.
-add <i>ctl_no</i> <i>port_no</i>	Sets CHAP user information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-chg <i>ctl_no</i> <i>port_no</i>	Changes CHAP user information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-rm <i>ctl_no port_no</i>	Deletes CHAP user information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-assign <i>ctl_no</i> <i>port_no</i>	Assigns CHAP user to the target. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-release <i>ctl_no</i> <i>port_no</i>	Releases the target from CHAP user. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-availablelist <i>ctl_no</i> <i>port_no</i>	A list of targets that can be assigned to the specified controller number, port number, and CHAP user is displayed. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-user <i>user_name</i>	Specify CHAP user name. <i>user_name</i> : CHAP user name (See Note 1)
-userfile <i>file_name</i>	Specify the file(path) name when setting the CHAP user name using a file. <i>file_name</i> : File(path) name

Option	Description
-tno <i>target_no</i> ...	Specify the target number. Single or multiple target numbers can be specified. Single specification: Specifying a single target number. Example: -tno 3 Multiple specification: Specifying multiple target numbers. Example: -tno 0 1 2 3 4 5 8 -tno 0-5 8 <i>target_no</i>: Target number
-talias <i>target_alias</i> ...	Specify the target alias. Space in front and in the rear of the character string is removed. Cannot specify spaces only. Single or multiple target aliases can be specified. Single specification: Specifying a single target alias. Example: -talias solaris Multiple specification: Specifying multiple target aliases. Example: -talias irix01 solaris win001 <i>target_alias</i>: Target alias (See Note 2)
-newuser <i>new_user_name</i>	Specify CHAP user name to be changed. <i>new_user_name</i>: CHAP user name (See Note 1)
-newuserfile <i>file_name</i>	Specify the file(path) name when changing the CHAP user name using a file. <i>file_name</i>: File(path) name
-secret	Specify this option when changing Secret. (See Note 3)
-all	Specify this option when releasing all targets that have been assigned to the specified CHAP user.
Note 1: For CHAP user name, less than or equal to 256 ASCII characters (alphabetic characters and the following symbols) can be used. (., -, +, @, _, =, :, /, [,], ~, (space)) Note 2: For target alias, less than or equal to 32 ASCII characters (alphabetic characters, numerals, and the following symbols) can be used. (!, #, \$, %, &, ', +, -, ., =, @, ^, _{, }, ~, (,), [,], (space)) Note 3: For Secret, 12 to 32 ASCII characters (alphabetic characters and the following symbols) can be used. (., -, +, @, _, =, :, /, [,], ~, (space))	

Example

The following example displays the CHAP information for an array ams500.

```
% auchapuser -unit ams500 -refer
Port 0A
User Name
  mng001
  mainte001
Port 0B
:
%
```

Referencing/sending a ping

Command name

auping

Format

```
AMS, WMS, SMS, AMS2000, HUS
auping -unit unit_name -refer

auping -unit unit_name -start ctl_no port_no
      -addr inet_addr
```

Description

This command references the result of Ping execution or send Ping.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	References the result of Ping execution.
-start <i>ctl_no</i> <i>port_no</i>	Sends Ping from the specified port. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-addr <i>inet_addr</i>	Specify the IP address. <i>inet_addr</i> : IP address

Examples

The following example issues a ping to an array ams500.

```
% auping -unit ams500 -start 0 A -addr 192.168.15.207
Password:
Are you sure you want to start the ping test?
(y/n [n]): y
When starting the ping test, the access from the host may be delayed or the iSCS
I connection may temporarily be lost to the specified controller.
Do you want to continue processing? (y/n [n]): y
The ping test has been started.
Please check a result as -refer option.
%
```

The following example displays a result of an array ams500.

```
% auping -unit ams500 -refer
Password:
Port Destination IP Address Success Count Status
0A 192.168.15.207 0/ 5( 0%) Complete
0B --- --- Not Executing
1A --- --- Not Executing
1B --- --- Not Executing
%
```

Referencing/setting the backend diagnosis information

Command name

aubackenddiag

Format

```
9500V, AMS, WMS
aubackenddiag -unit unit_name -refer

aubackenddiag -unit unit_name -set -autodiagthres num
```

Description

This command refers to or sets the backend diagnosis information.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_", ".", "@", or " (space)". Space in front and back of the character string is removed.
-set	References the backend diagnosis information.
-autodiagthres <i>num</i>	Specify the auto diagnosis threshold.

Examples

The following example rdisplays the backend diagnosis information of an array ams500.

```
% aubackenddiag -unit ams500 -refer
Password:
Auto Diagnosis Threshold : 10
%
```

The following example sets the backend diagnosis information of an array ams500.

```
% aubackenddiag -unit ams500 -set -autodiagthres 255
Password:
Are you sure you want to set the backend diagnosis information?
(y/n [n]): y
The backend diagnosis information has been set successfully.
%
```

Setting the SNMP environment information and outputting its file

Command name

ausnmp

Format

```
9500V, AMS, WMS, SMS, AMS2000, HUS
ausnmp -unit unit_name -get [ -config config.txt ] [ -name name.txt ]
ausnmp -unit unit_name -set [ -config config.txt ] [ -name name.txt ]
```

Description

This command reads and sets up the SNMP environment file.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " (space)". Space in front and back of the character string is removed.
-get	Reads the SNMP environment information and outputs it into a specified file. Specify one or more options from "-config" or "-name".
-set	References the backend diagnosis information.
-config config.txt	Specify the file name of environment setting file.
-name name.txt	Specify the file name of array unit name setting file.

Example

The following example sets the SNMP information of an array ams500a1.

```
% ausnmp -unit ams500 -set -config config.txt
Password:
Are you sure you want to set the SNMP information to the subsystem? (y/n [n]): y

The SNMP information has been set successfully.
%
```

Referencing/setting e-Mail alert information

Command name

auemailalert

Format

```
SMS, AMS2000, HUS
auemailalert -unit unit_name -refer

auemailalert -unit unit_name -testmail -ctl0 | -ctl1

auemailalert -unit unit_name -mail enable | disable

When the parameter information is not set
auemailalert -unit unit_name -set
    -domain domain_name
    -mailsvaddr server_address
    -fromaddr from_address
    -toaddr to_address [ -to | -bcc ]
    [ -repaddr reply_address ]

When the parameter information has already been set
auemailalert -unit unit_name -set
    [ -domain domain_name ]
    [ -mailsvaddr server_address ]
    [ -fromaddr from_address ]
    [ -toaddr to_address [ -to | -bcc ] ]
    [ -repaddr reply_address ]

auemailalert -unit unit_name -chg
    -toaddr to_address
    [ -newtoaddr new_to_address ]
    [ -to | -bcc ]

auemailalert -unit unit_name -rm
    -toaddr to_address

auemailalert -unit unit_name -init
```

Description

This command references or sets the E-Mail Alert information.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "- (minus)", "_ (underline)", "." (period)", "@", or " (space)". Space in front and back of the character string is removed.
-refer	References the E-Mail Alert information.
-testmail	Sends a test mail.

Option	Description
-mail enable disable	Specify whether sending a mail or not. enable : Sends a mail. disable: Does not send a mail.
-set	Sets the E-Mail Alert information.
-chg	Changes the E-Mail Alert information.
-rm	Deletes the E-Mail Alert information.
-init	Initializes the E-Mail Alert information.
-ctl0 -ctl1	Specify the controller.
-domain <i>domain_name</i>	Specify the domain of the mail server. Specify the domain in less than or equal to 255 alphanumeric characters or codes. <i>domain_name</i> : Domain of the mail server
-mailsrvaddr <i>server_address</i>	Specify the mail server IP address. <i>server_address</i> : Mail server IP address
-fromaddr <i>from_address</i>	Specify the source mail address. Specify the source mail address in less than or equal to 63 alphanumeric characters or codes. <i>from_address</i> : Source mail address
-toaddr <i>to_address</i>	Specify the destination mail address. Specify the destination mail address in less than or equal to 63 alphanumeric characters or codes. <i>to_address</i> : Destination mail address
-to -bcc	When the -set option is specified: - Specify the send type of source mail address. - If omitted send type, To is used. - When the -chg option is specified, specify the changed send type.
-repaddr <i>reply_address</i>	Specify the reply mail address. Specify the reply mail address in less than or equal to 63 alphanumeric characters or codes. <i>reply_address</i> : Reply mail address
-newtoaddr <i>new_to_address</i>	Specify the changed destination mail address. Specify the destination mail address in less than or equal to 63 alphanumeric characters or codes. <i>new_to_address</i> : Destination mail address

Example

The following example displays the E-Mail Alert information of an array sms100.

```
% auemailalert -unit sms100 --refer
E-mail Error Report : Disable
Parameter Setting
CTL0 : Unfinished
CTL1 : Unfinished

Setting Status      : Normal
Parameter Information
Domain Name         : N/A
Mail Server Address : N/A
From Address        : N/A
Send To Address1    : To: N/A
Send To Address2    : To: N/A
Send To Address3    : To: N/A
Reply To Address    : N/A
%
```

Referencing/setting the LED information

Command name

aulocateled

Format

```
AMS2000, HUS
aulocateled -unit unit_name --refer

aulocateled -unit unit_name -set [ -uno unit_no ... on | off ]
[ -ctu on | off ]
```

Description

This command references or sets the LED information.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	References the LED information.
-set	Sets the LED information.
-uno <i>unit_no</i> ... on off	Specify the unit number which instructs turning on or off of the LED. <i>unit_no</i>: Unit number Single or multiple unit numbers can be specified. Single specification: Specifying a single unit number. Example: -uno 3 Multiple specification: Specifying multiple unit numbers. Example: -uno 1 2 3 4 5 8 -uno 1-5 8 on : Turns on the LED. off: Turns off the LED.

Examples

The following example displays the LED information of an array unit ams2300a1.

```
% aulocateled -unit ams2300a1 -refer
Unit LED
0 OFF
1 OFF
2 OFF
:
%
```

The following example sets the LED information of an array unit ams2300a1.

```
% aulocateled -unit ams2300a1 -set -uno 0-1 on
Are you sure you want to set LED information?
(y/n [n]): y
LED information has been set successfully.
%
```

Referencing/Starting additional unit information

Command name

auadditionalunit

Format

```
AMS2000
auadditionalunit -unit unit_name --refer
auadditionalunit -unit unit_name --add
```

Description

This command refers to the additional unit information or starts the addition.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " (space)". Space in front and back of the character string is removed.
-refer	References the information of adding unit.
-add	Starts the addition of the unit.

Examples

The following example displays the additional unit information of an array unit ams2300a1.

```
% auadditionalunit --unit ams2300a1 --refer
Status      : Normal(No Execute)
Adding Unit No.: ---
Base Unit No. : ---
%
```

The following example starts the additional unit information of an array unit ams2300a1.

```
% auadditionalunit --unit ams2300a1 --add
Are you sure you want to start to add units? (y/n [n]): y
Now adding units. Please do not power off the units and do not pull the cable fr
om the units.
Adding units have been started.
%
```

Referencing/setting LAN port information

Command name

aulanport

Format

SMS, AMS2000, HUS
aulanport -unit unit_name -refer

When setting the port effective or ineffective.

aulanport -unit unit_name -set
-ctl0 | -ctl1 -nonsecureport enable | disable

When setting the port number.

aulanport -unit unit_name -set
-ctl0 | -ctl1 [-nonsecureportnum port_num]
[-secureportnum port_num]

HUS 100

aulanport -unit unit_name -refer

When setting the port effective or ineffective.

aulanport -unit unit_name -set
-ctl0 | -ctl1 -nonsecureport enable | disable

When setting the port number

aulanport -unit unit_name -set
-ctl0 | -ctl1 [-nonsecureportnumb port_num]
[-secureportnum port_num]

aulanport -unit unit_name -set
-packetfiltering enable | disable

Description

This command references and sets LAN port information.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	References LAN port information.
-set	Sets LAN port information.
-ctl0 -ctl1	Specify the controller.
-nonsecureport enable disable	Specify whether to set the non-secure port to enable or disable. enable : Enables the non-secure port. disable: Disables the non-secure port.
- nonsecureportnum <i>port_num</i>	Specify the port number of non-secure port. <i>port_num</i> : Port number
-secureportnum <i>port_num</i>	Specify the port number of secure port. <i>port_num</i> : Port number

Examples

The following example displays the LAN port information of an array unit hus110 when the LAN access filtering is enabled.

```
% aulanport -unit hus110 --refer

CTL Non-secure Port      Non-secure Port Number Secure Port Number
0 Disable                2000                    28355
1 Enable                  2000                    28355

Packet Filtering : Disable
Filtering Log

CTL0
Time                      IP Address
2012/12/24 21:44:02      162.98.209.44
2012/12/24 21:44:00      162.98.209.46

CTL1
Time                      IP Address
2012/12/24 21:44:00      162.98.209.48
2012/12/24 21:45:02      162.98.209.47

%
```

The following example displays the LAN port information of an array unit hus110 when the LAN access filtering is disabled.

```
% aulanport -unit hus110 -refer

CTL Non-secure Port      Non-secure Port Number Secure Port
Number
0 Disable                2000                    28355
1 Enable                  2000                    28355

Packet Filtering : N/A
Filtering Log

CTL0
Time                      IP Address
CTL1
Time                      IP Address

%
```

The following example sets the LAN port information (Packet Filtering) of an array unit hus110.

```
% aulanport -unit hus110 -set -packetfiltering enable
Are you sure you want to set the LAN port information? (y/n
[n]): y
When Packet Filtering is enabled, the LAN access from the
blocked node will not be allowed temporarily.
```

```
Are you sure you want to continue? (y/n [n]): y
The LAN port information has been set successfully.
%
```

The following example displays the LAN port information of an array unit ams2300a1.

```
% aulanport -unit ams2300a1 -refer
CTL Non-secure Port Non-secure Port Number Secure Port Number
  0 Enable                2000                28355
  1 Enable                2000                28355
%
```

The following example sets the non-secure LAN port information of an array unit ams2300a1.

```
% aulanport -unit ams2300a1 -set -ctl0 -nonsecureportnum 2000
Are you sure you want to set the LAN port information?
(y/n [n]): y
The LAN port information has been set successfully.
Please add "df-damp-snm port number/tcp" to services file, or
change the port number of df-damp-snm in the file.
%
```

Setting the SSL option

Command name

ausslopt

Format

```
SMS, AMS2000, HUS
ausslopt -unit unit_name -import -certificate file_name
```

Description

This command sets the SSL option.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-import	Imports the SSL certificate.
-certificate <i>file_name</i>	Specify the name of the file(path) to set the SSL certificate. <i>file_name</i> : File(path) name

Example

The following example imports the SSL certificate (file name: xxxxx.xxx) of an array unit ams2300a1.

```
% ausslopt -unit ams2300a1 -import -certificate xxxxx.xxx
Are you sure you want to import the SSL certificate?
(y/n [n]): y
The SSL certificate has been imported successfully.
%
```

Referencing/setting the UPS information

Command name

auups

Format

```
HUS100
auups -unit unit_name -refer
auups -unit unit_name -set
-info Standard |
        UPSInterlock1 | UPSInterlock2 | UPSInterlock3
```

Description

This command references or sets the UPS information.

Example

The following example displays the UPS information of an HUS 110 storage system.

```
% auups -unit hus110a1 -refer
UPS Information
  Current : Standard Mode
  Setting : Standard Mode
%
```

The following example sets the UPS information of an HUS 110 storage system.

```
% auups -unit hus110a1 -set -info UPSInterlock1
Are you sure you want to set the UPS information? (y/n [n]):
y
The UPS information set successfully.
In order to enable the set, shutdown the array.
%
```

Referencing/setting the host response

Command name

auhostresp

Format

```
HUS100
auhostresp -unit unit_name -refer

auhostresp -unit unit_name -set
-SystemOption AutoSetSeparating enable | disable
```

Description

This command references or sets the host response.



NOTE: When the “Auto Set Separating Mode” setting changes, the “Autodiscover New HG Mode” of a port with a VMware host group can automatically change. If you have changed the “Autodiscover New HG Mode” setting, confirm the enable/disable state of the mode after the “Auto Set Separating Mode” setting has changed.

Example

The following example displays the host response information of an HUS 110 storage system.

```
% aulhostresp -unit hus110a1 -refer
Host Response
System
Auto Set Separating Mode = OFF
%
```

The following example sets the host response information of an HUS 110 storage system.

```
% aulhostresp -unit hus110a1 -set -SystemOption
AutoSetSeparating enable
Are you sure you want to set the host response? (y/n [n]): y
The host response has been set successfully.
%
```

Referencing/setting the SSD/FMD Endurance information

Command name

ausssdfmdendurance

Format

```
HUS100
ausssdfmdendurance -unit unit_name -refer

ausssdfmdendurance -unit unit_name -chg
-alertlevelthreshold num
```

Description

This command references or sets the SSD Endurance information.

Example

The following example displays the SSD Endurance information of an array unit hus150a1.

```
% ausssdfmdendurance -unit hus150a1 -refer
Alert Level Threshold  SSD: 90%
                        FMD: 90%

History  1: 2012/04/11
         2: 2012/04/21
         3: 2012/05/01
         4: N/A
```

								History			
Unit	HDU	RAIDGr	DPPool	Type	Used	EndInd	EndStat	1	2	3	4
0	0	1	N/A	SSD	50%	Normal		49%	48%	47%	N/A
1	1	5	N/A	FMD	91%	Over		90%	89%	88%	N/A
2	2	N/A	8	SSD	99%	N/A		98%	97%	96%	N/A

%

The following example sets the SSD endurance information of an array unit hus110a1.

```
% ausssdfmdendurance -unit hus150a1 -chg -
fmdalertlevelthreshold 90
```

```
Are you sure you want to change the SSD/FMD endurance
information?(y/n [n]): y
The SSD/FMD endurance information has been changed
successfully.
```

%

Referencing/setting the FMD Battery Life Information

Command name

aufmdbatterylife

Format

HUS100

aufmdbatterylife -unit unit_name -refer

aufmdbatterylife -unit unit_name -chg -
alertlevelthreshold num

Description

This command references or sets the FMD battery life.

Example

The following example displays the FMD endurance information of an array unit hus150a1.

```
% aufmdbatterylife -unit hus150a1 -refer
```

```
Alert Level Threshold: 90%
```

```
History 1: 2012/04/11
```

```
2: 2012/04/21
```

```
3: 2012/05/01
```

```
4: N/A
```

Unit	HDU	RAIDGr	DPPool	LifeInd	LifeStat	1	2	3	4
0	0	1	N/A	50%	Normal	49%	48%	47%	N/A
1	1	5	N/A	91%	Over	90%	89%	88%	N/A
2	2	N/A	8	99%	N/A	98%	97%	96%	N/A

%

The following example sets the FMD endurance information of an array unit hus150a1.

```
% aufmdbatterylife -unit hus150a1 -chg -alertlevelthreshold
90
```

```
Are you sure you want to change the FMD battery life
information? (y/n [n]): y
```

%

```
10.32.168.19 1745
:fe80::fdc7:81e0:850f:7f02 33333
333333333344444444444444444444 10.32.168.10 54741
```

The following example displays the iSCSI host login information of an array unit hus150a1. When no login host exists:

```
% auhostlogininfo -unit hus150a1 -refer
DMEC002015: No information displayed.
```

Adding/Removing the I/F Module/Interface Board

Command name

apartinterface

Format

HUS100

apartinterface -unit unit_name -add

When removing I/F module:

apartinterface -unit unit_name -rm -ifmodule slot_no

When removing interface board.

apartinterface -unit unit_name -rm -ifboard

Description

This command adds or removes the I/F module or interface board.

Example

Perform the host I/O module addition of Slot 0F/1F of array unit hus150.

```
% apartinterface-unit hus150 -add
Are you sure you want to continue? (y/n [n]): y
The preparation for adding host I/O modules has started.
Make sure to add the same host I/O modules type to the slot
F of controller 0 and controller 1.
10 seconds later, press the return key.
If you press the return key before to add host I/O modules,
the adding host I/O modules is failed and unequipped.
When the slot F of controller 0 and controller 1 already
added to host I/O
modules, press the return key.
Starting the host I/O modules addition could lead to
performance deterioration or host time-outs.
The addition of I/O modules has been started.
%
```

Try again adding the host I/O module after the addition of the host I/O module in the array unit hus150.

```
% apartinterface-unit hus150 -add
The preparation for adding host I/O modules has started.
Make sure to add the same host I/O modules type to the slot
F of controller 0 and controller 1.
10 seconds later, press the return key.
If you press the return key before to add host I/O modules,
the adding host I/O modules is failed and unequipped.
When the slot F of controller 0 and controller 1 already
added to host I/O modules, press the return key.
Starting the host I/O modules addition could lead to
performance deterioration or host time-outs.
The addition of I/O modules has been started.
%
```

Perform the interface board addition whose array unit hus130.

```
% aupartinterface-unit hus130 -add
Are you sure you want to continue? (y/n [n]): y
The preparation for adding interface boards has been
issued.
Make sure to add the same I/F boards type to controller 0
and controller 1.
10 seconds later, press the return key.
If press the return before to add I/F boards, the adding I/
F boards is failed and unequipped.
When controller 0 and controller 1 already added to I/F
boards, press the return key.
Starting the I/F boards addition could lead to performance
deterioration or host time-outs.
The addition of I/F boards has been started.
%
```

Try again adding the interface board after the addition of the interface board in the array unit hus130.

```
% aupartinterface-unit hus130 -add
The preparation for adding interface boards has been
issued.
Make sure to add the same I/F boards type to controller 0
and controller 1.
10 seconds later, press the return key.
If press the return before to add I/F boards, the adding I/
F boards is failed and unequipped.
When controller 0 and controller 1 already added to I/F
boards, press the return key.
Starting the I/F boards addition could lead to performance
deterioration or host time-outs.
The addition of I/F boards has been started.
%
```

Perform the starting of the host I/O module removal of Slot 0F/1F whose array unit hus150.

```
% aupartinterface-unit hus150 -rm -ifmodule F
Are you sure you want to removed host I/O modules?
Removing these host I/O modules will cause host access to
all logical units via the host I/O modules stop. Please stop
host access before you removing it.
Are you sure you want to continue? (y/n [n]): y
The remove host I/O modules has been issued.
By "auparts" command, verify the status to make sure that
you are able to remove the host I/O modules. Verify that
the STATUS LED is red, then remove the host I/O modules from
controller 0 and controller 1.
%
```

Perform the starting of the interface board removal whose array unit hus130.

```
% aupartinterface-unit hus130 -rm -ifboard
Are you sure you want to removed interface boards?
Removing these interface boards will cause host access to
all logical units via the interface boards to stop. Please
stop host access before you removing it.
Are you sure you want to continue? (y/n [n]): y
The remove interface boards has been issued.
By "auparts" command, verify the status to make sure that
you are able to remove the interface boards. Verify that
the STATUS LED is red, then remove the interface boards from
controller 0 and controller 1.
%
```

Perform the preparation of the host I/O module addition of Slot 0F/1F whose array unit is hus150.

```
% aupartinterface -unit hus150 -prepareadd
Are you sure you want to start the preparation of adding
host I/O modules? (y/n [n]): y
The preparation for adding host I/O modules has started.
By "auparts" command, verify the status to make sure that
you are able to remove the interface boards. Verify that
the STATUS LED is red, then remove the interface boards from
controller 0 and controller 1.
%
```

File output of configuration and configuration setting by file

This section describes how to save the array configuration information to a text file, or to set the array configuration using a text file. The configuration information that is saved to the text file is the status of the system parameters and the constituent parts of the RAID/LU and the array. The configuration to be set is the system parameters and RAID/LU. The status of the constituent parts of the array cannot be set.

The configuration information is handled with separate text files for the system parameters and for RAID/LU.

The copying of configuration between arrays can be carried out, by saving a text file of the configuration from an array, and then by using the saved text file to set another array.

Editing a text file to set an array can be done, but it is recommended that this function be used only for the configuration of the same array. To change the configuration, it is recommended that you use the configuration procedures.

The topics covered in this section are:

- [File output of system parameters on page 3-177](#)
- [Controller parameters on page 3-182](#)
- [File output configuration of RAID/volume and status on page 3-183](#)
- [Changing the Advanced Security Mode on page 3-192](#)
- [Setting the system parameters with a file on page 3-193](#)
- [Setting the RAID/volume definition with a file on page 3-195](#)
- [Import/export the system constituent information on page 3-197](#)

File output of system parameters

Command name

ausyspout

Format

9500V
ausyspout -unit unit_name -file file_name

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-file <i>file_name</i>	Specify the name the file (path) to output the system parameters.

Description

This command outputs the contents of the setting for the system parameters set in the array in a specified file, in a text format.

Example

The following example outputs the setting information of the system parameters of an array 9500a1 to file: sysprm.txt to the directory where Storage Navigator Modular 2 is installed.

```
% ausyspout -unit 9500a1 -file sysprm.txt
%
```

The format of the output file consists of the following fields:

File header
Registration name with Navigator 2 of the array
Output time (time of the computer where Navigator 2 is installed)
Firmware revision
Array type
Common controller parameters
Controller parameters

[Figure 3-1 on page 3-178](#) describes the fields of this output.

```

System parameter list.
DF Name : 9500
Date : 2008/11/19 15:42:16
Firmware Revision : 065B/F
Array Unit Type : 9500V
Serial Number : 65000026

---- Common Parameter ----
System Startup Attribute = Dual Active Mode
SCSI ID/Port ID Take-over Mode = ---

---- CTL0 Parameter ----
RS232C Error Information Outflow Mode = OFF

---- CTL1 Parameter ----
RS232C Error Information Outflow Mode = OFF

```

System parameter list.

DF Name : 9500

Date : 2008/11/19 15:42:16

Firmware Revision : 065B/F

Array Unit Type : 9500V

Serial Number : 65000026

---- Common Parameter ----

System Startup Attribute = Dual Active Mode

SCSI ID/Port ID Take-over Mode = ---

---- CTL0 Parameter ----

RS232C Error Information Outflow Mode = OFF

---- CTL1 Parameter ----

RS232C Error Information Outflow Mode = OFF

Figure 3-1: Format of System Parameter Output File

Common controller parameters

The common system parameters of the array are output. An output example of the system parameters of 9500 is shown in [Figure 3-2](#).

```
•
---- Common Parameter ----
System Startup Attribute = Dual Active Mode
  SCSI ID/Port ID Take-over Mode = ---
    Data Share Mode = Used
  Delay Planned Shutdown = 0
  Option 1
    Drive Detach mode enable = ON
  Option 2
    PROCOM mode enable = OFF
    Report status (normal / warning) = OFF
    Turbo LU Warning = OFF
    NX Mode = OFF
    Auto Reconstruction Mode = OFF
    Forced Write Through Mode = OFF
    Changing Logical Unit Mode 1 = OFF
    Multiple Stream Mode = OFF
    Multiple Stream Mode (write) = OFF
    Multiple Stream Mode (Read) = OFF
    High-speed Sequential Write Mode = OFF
  Operation if the Processor failures occurs = Reset a Fault
INQUIRY Information
  Command Queuing = ON
  Vendor ID = HITACHI
  Product ID = DF600F
  ROM Microprogram Version =
  RAM Microprogram Version =
  Web Title
  Web Title = "df700srv"
```

Figure 3-2: Output Example of System Common Parameters

[Table 3-4](#) describes the common controller parameters.

Table 3-4: Common Parameters

No.	Parameter	Option
1	System Startup Attributes	System Startup
	Single Mode	Single
	Dual Active Mode	DualIDTake
	Hot Standby Mode	DualIDTake
	SCSI ID/Port ID Take-over Mode	
	Used	HotIDTake
	Not Used	HotNotIDTake
	Default Controller	TalkingID

Table 3-4: Common Parameters (Continued)

No.	Parameter	Option
	Data Share Mode	-DataShare
2	Delay Planned Shutdown	-DelayPlannedShutdown
3	Option 1	
	Drive Detach Mode Enable	-DriveDetach
4	Option 2	
	PROCOM Mode Enable	-PROCOM
	Report Status (normal/warning)	-ReportStatus
	Turbo LU Warning	-LuCacheWarning
	NX Mode Enable	-NX
	Auto Reconstruction Mode Enable	-AutoReconst
	ForcedWriteThrough	-ForcedWriteThrough
	Changing Logical Unit Mode 1	-LUChanging1
	Multiple Stream Mode	-MultiStream
	Multiple Stream Write Mode	-MultiStreamWrite
	Multiple Stream Read Mode	-MultiStreamRead
	High-Speed Sequential Write Mode	-HiSpeedSeqWrite
	ShadowImage I/O Switch Mode	ShadowImageIOSwitch
	Synchronize Cache All Execution	SyncCacheAllExec
	Synchronize Cache Invalid	SyncCacheInvalid

Table 3-4: Common Parameters (Continued)

No.	Parameter	Option
5	Operation if the Processor Failures Occur	-ProcessorFailures
6	INQUIRY Information	
	INQUIRY Information	-InquiryCommandQueue
	Vendor ID	-inquiryVendor
	Product ID	-inquiryProduct
	ROM Microprogram Version	-inquiryRomMicro
	RAM Microprogram Version	-inquiryRammicro
7	Web Title	-WebTitle

Depending on the array that is connected, there are items that may not require setting; these items will not be saved in the file. If the value of an item in the parameters is given as “---”, it is an item that is not supported in the configuration of the array.

Controller parameters

The parameters of the controller in the system parameters of the array are listed.

```
---- CTL0 Parameter ----
RS232C Error Information Outflow Mode = OFF
Write & Verify Execution Mode = ON
LAN Const
  DHCP = OFF
  IP Address = 0.0.0.0
  Subnet Mask = 0.0.0.0
  Default Gateway = 0.0.0.0
  Ether Address = 00:00:00:00:00:00
---- CTL1 Parameter ----
RS232C Error Information Outflow Mode = OFF
Write & Verify Execution Mode = ON
LAN Const
  DHCP = OFF
  IP Address = 0.0.0.0
  Subnet Mask = 0.0.0.0
  Default Gateway = 0.0.0.0
  Ether Address = 00:00:00:00:00:00
```

Figure 3-3: Output Example of System Controller's Parameters

The parameters of controller are the items shown in [Table 3-5](#).

Table 3-5: Controller Parameters

Parameter	Option
RS232C Error Information Outflow Mode	-Rs232cOutflow
Write & Verify Execution Mmode	-WriteVerifyExecution
LAN Const	-dhcp5 -IPAddress -SubnetMarsk -DefaultGateway

Depending on the array that is connected, there are items that may not need to be set; these items will not be saved in the file. If the value of an item in the parameters is given as "---", it is an item that is not supported in the configuration of the array.

File output configuration of RAID/volume and status

Command name

auconfigout

Format

```
9500V
auconfigout -unit unit_name -file file_name
```

Description

This command outputs the RAID/LU configuration and constituent parts status already set in an array in specified file in a text format.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and back of the character string is removed.
-file <i>file_name</i>	Specify the name the file (path) to output the configuration information.

Example

The following example outputs RAID/LU configuration information of array 9500a1, by the config.txt file, into a directory in which Storage Navigator Modular 2 has been installed.

```
% auconfigout -unit 9500a1 -file config.txt
%
```

The format of the output file consists of the following items. The layout of the output file is shown in [Figure 3-4](#). [Figure 3-5 on page 3-185](#) is the layout of the output file for 9500.

File header

Registration name at Navigator 2 of the array

Output time (time of the computer where Navigator 2 is installed)

Firmware revision

Array type

RAID/LU configuration

Status of constituent parts

File header

Registration name with Navigator of the array unit

Output time of the file
(Time of the machine where Navigator is installed)

Array unit configuration information list.

DF Name : 9500

Date : 2008/11/19 15:54:49

Firmware Revision : 065B/F

Array Unit Type : 9500V

Serial Number : 65000026

Firmware revision

Array unit type

RAID configuration information

```

---- RAID Configuration ----
RAID  RAID  Start Location  Number of HDU  Number of  Free Capacity  Type
Group Level [Unit No. HDU No.] in parity group parity group [block]
0      5      0          0      5          1          134217728 FC

```

-- End

LU configuration information

```

---- LU Configuration ----
LU  Capacity  Status  Staging  C-CTL  D-CTL  RG RAID  Capacity  Type

```

-- End

Drive information

```

---- Drive Configuration ----
Location  Vendor ID  Product ID  Revision  Capacity  Status  Serial Number  Type
Unit0 ,HDU0  HITACHI  DISK-DRIVE  0AA0      72GB  Undefined  U00-H00-  FC
Unit0 ,HDU1  HITACHI  DISK-DRIVE  0AA0      72GB  Undefined  U00-H01-  FC
Unit0 ,HDU2  HITACHI  DISK-DRIVE  0AA0      72GB  Undefined  U00-H02-  FC
Unit0 ,HDU3  HITACHI  DISK-DRIVE  0AA0      72GB  Undefined  U00-H03-  FC
Unit0 ,HDU4  HITACHI  DISK-DRIVE  0AA0      72GB  Undefined  U00-H04-  FC
Unit0 ,HDU5  HITACHI  DISK-DRIVE  0AA0      72GB  Undefined  U00-H05-  FC
Unit0 ,HDU6  HITACHI  DISK-DRIVE  0AA0      72GB  Undefined  U00-H06-  FC
Unit0 ,HDU7  HITACHI  DISK-DRIVE  0AA0      72GB  Undefined  U00-H07-  FC
Unit0 ,HDU8  HITACHI  DISK-DRIVE  0AA0      72GB  Undefined  U00-H08-  FC
Unit0 ,HDU9  HITACHI  DISK-DRIVE  0AA0      72GB  Undefined  U00-H09-  FC
Unit0 ,HDU10 HITACHI  DISK-DRIVE  0AA0      72GB  Undefined  U00-H10-  FC
Unit0 ,HDU11 HITACHI  DISK-DRIVE  0AA0      72GB  Undefined  U00-H11-  FC
Unit0 ,HDU12 HITACHI  DISK-DRIVE  0AA0      72GB  Undefined  U00-H12-  FC
Unit0 ,HDU13 HITACHI  DISK-DRIVE  0AA0      72GB  Undefined  U00-H13-  FC

```

-- End

Figure 3-4: RAID/LU Configuration information output file format

```

---- Controller Information ----
CTL      Status
0        Normal
1        Detach

---- Cache Information ----
              Controller 0              Controller 1
Slot      Capacity  Status      Capacity  Status
0          512      Normal          ---      ---
1          512      Normal

---- Fan Information ----
Location  Status
Unit0 ,Fan0 Normal
Unit0 ,Fan1 Normal

---- Battery Information ----
Location  Status
0          Normal

---- AC Power Information ----
Location  Status
Unit0 ,AC0 Normal
Unit0 ,AC1 Normal

---- Battery Backup Information ----
Location  Status
0          Normal
1          Normal

---- Loop Information ----
Path  Loop  Status
0      0      Normal
0      1      Alarm
1      0      Normal
1      1      Alarm

---- ENC Information ----
Location  Status

---- Unit Information ----
Unit  Type
0      FC

```

Controller information

Cache information

Fan information

Battery information

AC power information

Battery backup information

Loop information

Enclosure information

Unit information

Figure 3-5: RAID/volume configuration information output file format

The function outputs the RAID configuration of the array. RAIDs that have not been created appear as “-” in the “Level” column.

```

---- RAID Configuration ----
RAID  RAID  Start Location
Group Level [Unit No. HDU No.]  Number of HDU  Number of  Free Capacity  Type
                                in parity group parity group  [block]
0      5      0          0          5          1          527716352  FC

```

Figure 3-6: RAID array configuration

Table 3-6: RAID array configuration information

RAID Array Configuration Information	Description
RAID Group	RAID group number.
RAID Level	RAID level. If no RAID is set, “-” appears. No other information is displayed.
Start Location	
Unit No.	Starting unit number of the RAID group.
HDU No.	Starting HDU number of the RAID group.
Number of HDU in parity group	Number of HDUs in the parity group of the RAID group.
Number of parity group	Number of parity groups in the RAID group.
Free Capacity	Capacity [Block] that can be defined by the logical unit of the RAID group.
Type	Ddrive interface type is displayed.

Formatting LU configuration information

The LU configuration of the array is listed. Information is displayed up to the created LU numbers.

```

---- LU Configuration ----
LU  Capacity  Status  Staging  C-CTL  D-CTL  RG RAID  Capacity  Type
0    20480    Unformat  512  0    0    0  5    10.0 MB  FC
1    20480    Unformat  512  0    0    0  5    10.0 MB  FC
2    20480    Unformat  512  0    0    0  5    10.0 MB  FC

```

Figure 3-7: Volume configuration of the array

Table 3-7: Volume configuration information

LU Configuration Information	Description
LU	LU number.
Capacity	LU capacity (in units of block).
Status	Status of the logical unit.
Normal	Normal status in which the logical unit is defined and formatted.
Unformat	Status in which the logical unit is defined, but not formatted.
Detached	Status in which the logical unit is blocked.
Regression	Status in which the logical unit is regressed.

Table 3-7: Volume configuration information (Continued)

LU Configuration Information	Description
Invalidated(Normal)	Status in which the logical unit is invalidated (formatted).
Invalidated(Unformat)	Status in which the logical unit is invalidated (not formatted)
Invalidated(Regression)	Status in which the logical unit is invalidated (regression).
Staging Size	Pre-read data amount (in units of block).
C-CTL	number of the controller currently in use.
D-CTL	Default number of the controller controlling the logical unit.
RG	number of the RAID group that creates the logical unit.
RAId	RAID level of the RAID group that creates the logical unit.
Capacity	LU capacity (in units of MB or GB).
Type	drive interface type is displayed.

Format for drive information

The information and status of the drive of the array are listed.
 “Nothing” is shown after **Location** for the location of a HDU not installed.

```

---- Drive Configuration ----
Location  Vendor ID  Product ID  Revision  Capacity  Status  Serial Number  Type
Unit0 ,HDU0  HITACHI    DK32DJ-72FC  K0K0      72GB     standby  305K9173       FC
Unit0 ,HDU1  HITACHI    DK32DJ-72FC  K0K0      72GB     standby  305K9762       FC
Unit0 ,HDU2  HITACHI    DK32DJ-72FC  K0K0      72GB     standby  305L6457       FC
Unit0 ,HDU3  HITACHI    DK32DJ-72FC  K0K0      72GB     standby  305N4872       FC
Unit0 ,HDU4  HITACHI    DK32DJ-72FC  K0K0      72GB     standby  305K6936       FC
Unit0 ,HDU5  HITACHI    DK32DJ-72FC  K0K0      72GB     Undefined  304Z8738       FC
Unit0 ,HDU6  HITACHI    DK32DJ-72FC  K0K0      72GB     Undefined  305M9732       FC
Unit0 ,HDU7  HITACHI    DK32DJ-72FC  K0K0      72GB     Undefined  305L6000       FC
Unit0 ,HDU8  HITACHI    DK32DJ-72FC  K0K0      72GB     Undefined  305B0318       FC
Unit0 ,HDU9  HITACHI    DK32DJ-72FC  K0K0      72GB     Undefined  305N4614       FC
Unit0 ,HDU10 HITACHI    DK32DJ-72FC  K0K0      72GB     Undefined  305N8964       FC
Unit0 ,HDU11 HITACHI    DK32DJ-72FC  K0K0      72GB     Undefined  305L3562       FC
Unit0 ,HDU12 HITACHI    DK32DJ-72FC  K0K0      72GB     Undefined  305J2062       FC
Unit0 ,HDU13 HITACHI    DK32DJ-72FC  K0K0      72GB     Undefined  305N1101       FC

```

Figure 3-8: Information and status of the drive**Table 3-8: Drive status information**

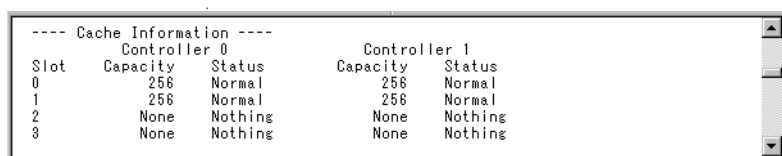
Drive Status Information	Description
Location	Installation location of the drive.
Vendor ID	Vendor ID of the drive.
Product ID	Product ID of the drive.
Revision	Firmware revision of the drive
Capacity	Capacity of the drive.
Status	Status of the drive.
Normal	Normal (RAID, LU defined).
Detached	Detached.

Table 3-8: Drive status information (Continued)

Drive Status Information	Description
Standby	Normal (LU undefined).
Undefine	Normal (RAID undefined).
Recon	Reconfiguring (copying from collection or backup).
Serial Number	Serial number of the drive.
Type	Interface type of the drive.

Format for cache information

The configuration information and status of the cache of the array are listed.



```

--- Cache Information ---
Controller 0
Slot  Capacity  Status
0      256      Normal
1      256      Normal
2      None     Nothing
3      None     Nothing
Controller 1
Capacity Status
256      Normal
256      Normal
None     Nothing
None     Nothing

```

Figure 3-9: Information and status of the array cache**Table 3-9: Cache information**

Cache Information	Description
Slot	Installation location of the cache.
Capacity	Capacity (in MB) of the cache of controller.
Status	Status of the cache of controller.
Normal	Normal.
Detached	Detached.
Nothing (---: Slot not supported)	Not installed.

Format for fan information

The status of the fan of the array is output.

```
---- Fan Information ----  
Location    Status  
0           Normal
```

Table 3-10: Fan Information

Fan Information	Description
Location	Installation location of the fan.
Status	Status of the fan.
Normal	Normal operation.
Alarm	Abnormal condition.

Format for battery information

The status of the battery of the array is output.

```
---- Battery Information ----  
Location    Status  
0           Normal
```

Table 3-11: Battery information

Battery Information	Description
Location	Installation location of the battery.
Status	Status of the battery.
Normal	Normal operation.
Alarm	Abnormal condition.

Format for AC power information

The status of the AC power supply of the array is output.

```
---- AC Power Information ----
Location      Status
Unit0,AC0     Normal
Unit0,AC1     Normal
Unit1,AC0     Nothing
Unit1,AC1     Nothing
:
:
```

Table 3-12: AC power information

AC Power Information	Description
Location	Installation location of the AC power supply.
Status	Status of the AC power supply.
Normal	Normal operation.
Alarm	Abnormal condition.

Format for battery backup status information

The status of the battery backup circuit of the array is output.

```
---- Battery Backup Information ----
Location      Status
0             Normal
1             Normal
```

Table 3-13: Battery backup information

Battery Backup Status Information	Description
Location	Installation location of the battery backup circuit
Status	Status of the battery backup circuit.
Normal	Normal operation.
Alarm	Abnormal condition.

Format for loop information

The status of the loop of the array is output.

```
---- Loop Information ----
Path Loop Status
0 0 Normal
0 1 Normal
1 0 Normal
1 1 Normal
```

Table 3-14: Loop information

Loop Information	Description
Path	Path number.
Loop	Loop number.
Status	Status of the loop.
Normal	Normal operation.
Alarm	Abnormal condition.

Format for enclosure information

The status of the enclosure of the array is output.

```
---- ENC Information ----
Location Status
Unit0,ENC0 Normal
Unit0,ENC1 Normal
Unit1,ENC0 Nothing
Unit1,ENC1 Nothing
...
```

Table 3-15: Enclosure information

Enclosure Information	Description
Location	Installation location of the enclosure.
Status	Status of the enclosure.
Normal	Normal operation.
Alarm	Abnormal condition.

Changing the Advanced Security Mode

Command name

auaccountopt

Format

auaccountopt -unit disk array-name -set -advancedsecuritymode enable

Description

The command sets the account authentication options. One of the options is the administrative state of the advanced security mode. This mode can be in either an enabled or disabled state.

Example

```
% auaccountopt -unit disk array-name -set -advancedsecuritymode enable
```

The Account Authentication is enabled. Please log in.

User ID: root

Password: root-password

Are you sure you want to set the account option? (y/n [n]): y

The account option has been set successfully.

%

Setting the system parameters with a file

Command name

ausyspset

Format

```
9500V
ausyspset -unit unit_name -file file_name
```

Description

This command sets the contents of the system parameters described in a file to the array.

If you set the file that was output under the condition in which any fee-based optional feature is in an unlocked (installed) status, the setting may terminate abnormally. Use a file that was output under the condition in which all fee-based optional features are in a locked (de-installed) status.

The files have a standard format. The format of the files is the same as those that are output from an array.

In the case of connection with a dual system, setting will not be carried out if one of the controllers is detached. Please confirm that the array is not in a warning status before using it.

When executing the command, an array is disabled to execute commands from both the host and the Storage Navigator Modular 2. In addition, to make the set system parameters effective, restart an array. The previous settings remain effective until the unit restarts.

After the setting is finished, restart an array, make sure that the unit has started, and then connect the unit to the host and the Storage Navigator Modular 2. When an array is restarted, the unit is not ready to accept access from the host until restarting is complete. After making sure that the host has stopped accessing, restart the unit.

-unit unit_name
Specify the name of the array unit to be set with the configuration information for the system parameters.
Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " " (space). Space in front and in the rear of the character string is removed.

-file file_name
Specify the name of the file (path) to input the configuration information.

For the file format and the contents of the settings in the files, see the following individually. When specifying individual items of a file, enter a blank space after "=".

For the file format, see subsection File output of system parameters System Parameters.

For setting items, see subsection Referencing/setting system parameters and subsection File output of system parameters System Parameters.

Example

The following example sets array 9500a1 according to the configuration system parameters described in sysprm.txt.

```
% ausyspset -unit 9500a1 -file sysprm.txt
Password:
When executing the command, the subsystem stops accepting access from the host.
Do you want to continue? (y/n [n]): y
In order to complete the setting, it is necessary to reboot the subsystem.
Host will be unable to access the subsystem while restarting. Host applications
that use the subsystem will terminate abnormally. Please stop host access before
you restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting b
egins.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute? (y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 4 - 15min.
The subsystem restarted successfully.
%
```

NOTE: It may take time for an array to respond, depending on the condition of the array. If the array does not respond after 15 minutes or more, check the condition of the array.

Setting the RAID/volume definition with a file

Command name

auconfigset

Format

```
9500V
auconfigset -unit unit_name -file file_name
```

Description

This command sets the RAID/LU setting information described in the file to the array.

When setting the RAID/LU, all the current RAID/LU will be deleted so that all the user data before the setting will be lost. If the user data is required, please perform the setting after taking a backup.

The files have a standard format. The format of the files is the same as those that are output from an array.

For the file format, see the following:

- Subsection File Output of the Configuration of RAID/LU
- Status of Constituent Parts

The items to be set in the files are the “RAID configuration information”, “LU configuration information”, and the “drive information” of the output files. The output files include items about the status of configuration components, but the items are ignored at the time of setting. The contents of the set items are described below.

- **RAID configuration information:** Sets up the RAID configuration. Specifies the RAID level, RAID number, and the RAID size. For RAIDs that are not to be setup, enters “-” for “Level”, and does not set other items.
- **LU configuration information:** Sets up an LU configuration. Specifies the LU number, LU capacity, and the amount of data pre-read, the number of the current controller controlling an LU, the number of the default controller controlling an LU, the RAID number, the RAID level, and the status of an LU.

When formatting, specifies “Normal” for the LU status. If other status is specified, formatting is not executed.

If all capacity contained in an RAID is allocated to one LU in the group, specifies “All” for “Capacity”.

Although “0” or “1” is specified for the number of the current controller controlling an LU, the current controller number is set to the same as the number of the default controller controlling an LU.

- **Drive information:** Sets up the configuration of HDUs mounted in the array for which to set the drive information. Specifies the drive capacity. Do not set other items, but lists the items.
- Specifies “Nothing” for not-mounted HDUs. If a capacity larger than a total capacity of mounted HDUs is specified, it is handled as an error, and an HDU configuration is not setup.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-file <i>file_name</i>	Specify the name the file (path) to input the configuration information.

Example

The following example sets array 9500a1 according to the RAID/LU configuration described in config.txt.

```
% auconfigset -unit 9500a1 -file config.txt
Password:
The new RAID/LU configuration will be set in the subsystem.
When this process starts, all of the current RAID/LU configuration will be deleted.
If you delete the logical unit(s), you will not be able to recover your data. Please make sure to perform backup of all important data before this operation.
When you delete your logical unit, the data becomes unusable. Systems or applications that use this subsystem will terminate abnormally. Please make sure to stop host access to the subsystem before performing this operation.
Are you sure you want to set new RAID/LU configuration? (y/n [n]): y
The new RAID/LU configuration will be set in the subsystem.
Are you sure you want to execute? (y/n [n]): y
The RAID configuration setting has started.
The RAID configuration setting is complete.
The LU configuration setting has started.
The LU configuration setting is complete.
LUx  format start
LUy  format start
LUx  format end:Completed Successfully.
LUz  format start
LUy  format end:Completed Successfully
.
.
.
The RAID/LU configuration have been set successfully.
%
```

Import/export the system constituent information

Command name

auconstitute

Format

AMS, WMS

```
auconstitute -unit unit_name --export
             -config file_name |
             -syp file_name |
             -hg file_name |
             -bootopt file_name |
             -parts file_name |
             -sysluuserlu file_name
```

```
auconstitute -unit unit_name --export
             -config file_name |
             -syp file_name |
             -bootopt file_name |
             -parts file_name |
             -sysluuserlu file_name |
             -port file_name |
             -lan file_name
```

```
auconstitute -unit unit_name --import
             -config file_name |
             -syp file_name |
             -hg file_name
             [-portopt] [-opt] [-map] [-wwn] |
             -bootopt file_name |
             -sysluuserlu file_name
```

```
auconstitute -unit unit_name --import
             -config file_name |
             -syp file_name |
             -bootopt file_name |
             -sysluuserlu file_name |
             -port file_name
             [-portopt] [-opt] [-map] [-wwn]
             [-scsiportopt] [-targetopt] [-targetmap]
             [-initiator] [-iscsi] [-isns] |
             -chapuser file_name |
             -lan file_name
```

SMS

```
auconstitute -unit unit_name --export
             -config file_name |
             -syp file_name |
             -bootopt file_name |
             -parts file_name |
             -port file_name |
             -lan file_name
```

```
auconstitute -unit unit_name --import
             -config file_name |
             -syp file_name |
             -bootopt file_name |
             -port file_name
             [-portopt] [-opt] [-map] [-wwn]
             [-scsiportopt] [-targetopt] [-targetmap]
             [-initiator] [-iscsi] [-isns] |
             -chapuser file_name |
             -lan file_name
```

AMS2000, HUS

```
auconstitute -unit unit_name --export
             -config file_name
             [-rglu | -dplu | -rgdplu] |
             -syp file_name |
             -bootopt file_name |
             -parts file_name |
             -port file_name |
             -lan file_name
```

```
auconstitute -unit unit_name --import
```

```

-config    file_name                [ -rglu | -dplu | -rgdplu ] |
-sysp      file_name |
-bootopt   file_name |
-port      file_name
           [ -portop ] [ -opt ] [ -map ] [ -wwn ]
           [ -iscsiportop ] [ -targetopt ] [ -targetmap ]
           [ -initiator ] [ -iscsi ] [ -isns ] |
-chapuser  file_name |
-lan       file_name

```

Description

This command outputs the system constituent information of the array to a specified file, in a text format. This command sets the system constituent information described in a file to the array.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-export	Exports the system constituent information.
-import	Imports the system constituent information.
-config <i>file_name</i>	Specify the name of a file(path) to output/set the RAID Groups/DP Pools/Logical Units information. When specification of input classification (-reglu, -dplu, -rgdplu) is omitted, to output/set the configuration information.
-rglu	Specify when outputting/setting up the RAID Groups/Logical Units information.
-dplu	Specify when outputting/setting up the DP Pools/Logical Units information.
-rgdplu	Specify when outputting/setting up the RAID Groups/DP Pools/Logical Units information.
-sysp <i>file_name</i>	Specify the name the file(path) to output/set the system parameters.
-hg <i>file_name</i>	Specify the name the file(path) to output/set the port information. When specification of input classification (-portop, -opt, -map, -wwn) is omitted, all the information is set up.
-portop	Specify when setting up the port option of the host group.
-opt	Specify when setting up the host group option.
-map	Specify when setting up the mapping information of the host group.
-wwn	Specify when setting up the host information.
-bootopt <i>file_name</i>	Specify the name the file(path) to output/set the boot option.
-parts <i>file_name</i>	Specify the name the file(path) to output the parts information.
-sysluuserlu <i>file_name</i>	Specify the name the file(path) to output/set the system LU/user LU. When specifications of input classification (-portop, -opt, -map, -wwn, -iscsiportop, -targetopt, -targetmap, -initiator, -iscsi, -isns) is omitted, all the information is set up.
-port <i>file_name</i>	Specify the name the file(path) to output/set the port information.
-iscsiportop	Specify when setting up the port option of the iSCSI port.
-targetopt	Specify when setting up the target option.

Option	Description
-targetmap	Specify when setting up the mapping information of the target.
-initiator	Specify when setting up the initiator information.
-iscs	Specify when setting up the iSCSI port information.
-isns	Specify when setting up the iSNS information.
-chapuser <i>file_name</i>	Specify the name the file(path) to set CHAP user information.
-lan <i>file_name</i>	Specify the name the file(path) to output/set the LAN information.

The format of the CHAP User information settings file is shown in [Table 3-16 on page 3-200](#).

Table 3-16: Format of CHAP user information settings file

File Contents	Description
User name, secret, Target No. or alias	The lines are invalid until <CHAP User> appears.
<CHAP User>,,	The valid lines are from <CHAP User> to <END>
<Port 0A>,,	The line specifies the port. (<Port ALL> specifies all ports)
hitachi-0,abcdefghij00,alias0	The first column is CHAP User, and the second column is Secret.
hitachi-1,abcdefghij01,alias1	The third row and the following are aliases of Target to assign.
#hitachi-1,abcdefghij01,alias1	The line with the first character of # is a comment line. (Invalid line)
hitachi-2,abcdefghij02,3	The Target number can be specified as the alias of Target.
<Port 0B>,,	
<Add CHAP User>,,	If <Add CHAP User> is specified, CHAP User is added.
hitachi-0,abcdefghij00,alias0	If nothing is specified, all CHAP Users are deleted, and then added.
hitachi-1,abcdefghij01,alias0,alias01,alias02	One or more Targets can be specified.
<Port 1A>,,	
<Port 1B>,,	
<END>,,	The line of <END> and the following are all invalid lines.

Examples

The following example outputs RAID/LU constituent information of array `ams500a1`, by `config.txt` file, into the directory in which Storage Navigator Modular 2 has been installed.

```
% auconstitute -unit ams500a1 -export -config config.txt
Password:
Are you sure you want to output the RAID/LU configuration to the file?
(y/n [n]): y
The RAID/LU configuration have been outputted to the file.
%The following example sets array ams500a1 according to the RAID/LU constituent
described in the config.txt file.

% auconstitute -unit ams500a1 -import -config config.txt
Password:
The new RAID/LU configuration will be set in the subsystem.
When this process starts, all of the current RAID/LU configuration will be deleted.
Do you want to continue processing? (y/n [n]): y
If you delete the logical unit(s), you will not be able to recover your data. Please make sure to perform backup of all important data before this operation.
When you delete your logical unit, the data becomes unusable. Systems or applications that use this subsystem will terminate abnormally. Please make sure to stop host access to the subsystem before performing this operation.
Are you sure you want to set new RAID/LU configuration? (y/n [n]): y
The new RAID/LU configuration will be set in the subsystem.
Are you sure you want to execute? (y/n [n]): y
The RAID configuration setting has started.
The RAID configuration setting is complete.
The LU configuration setting has started.
The LU configuration setting is complete.
The LU format setting is complete.
The RAID/LU configuration have been set successfully.
%
```

Outputting the RAID Group/DP Pool/volume information onto a file

Command name

auconfigreport

Format

SMS

```
auconfigreport -unit unit_name -filetype csv
                -resource rg
                [-item [raidlevel]] [paritygroups] [type]
                  [totalcapacity] [freecapacity] [priority]
                  [status] [recoveryinfo]
                [-fmtcapa tb | gb | mb | block]
                -file file_name
```

AMS2000, HUS

```
auconfigreport -unit unit_name -filetype csv
                -resource rg
                [-item [raidlevel]] [paritygroups] [type]
                  [totalcapacity] [freecapacity] [priority]
                  [status] [recoveryinfo]
                [-fmtcapa tb | gb | mb | block]
                -file file_name
```

SMS, AMS2000

```
auconfigreport -unit unit_name -filetype csv
                -resource lu
                [-item [capacity] [stripesize] [rgnum] [dpnum]
                  [raidlevel] [type] [pathinfo] [status]]
                [-fmtcapa tb | gb | mb | block]
                [-nosublu] [-totalsize]
```

HUS100

```
auconfigreport -unit unit_name -filetype csv
                -resource rg
                [-item [raidlevel] [paritygroups] [type]
                  [totalcapacity] [freecapacity] [priority]
                  [status] [recoveryinfo] [rotationalspeed]]
                [-fmtcapa tb | gb | mb | block]
                -file file_name
auconfigreport -unit unit_name -filetype csv
                -resource lu
                [-item [capacity] [stripesize] [rgnum] [dpnum]
                  [raidlevel] [type] [pathinfo] [status]
                  [tiermode] [rotationalspeed]]
                [-fmtcapa tb | gb | mb | block]
                [-nosublu] [-totalsize]
                -file file_name
[raidlevel1] [totalcapacity]
                [consumedcapacity]
                [type] [status] [recoveryinfo]
                [stripesize] [needingpreparationcapacity]]
                [tiermode] [utilizationpercent]
                [overprovisioningpercent]
                [replicationavailablecapacity]
                [replicationutilizationpercent]]
                [-item [raidlevel1] [totalcapacity]
                [-fmtcapa tb | gb | mb | block]
                -file file_name
```

Description

This command outputs the RAID group, DP pool or LU information to a specified file. Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and back of the character string is removed.
-filetype csv	Specify the file format to output. csv CSV format
-resource rg lu	Specify resource to output. rg: RAID group information lu: LU information
-item[<i>raidlevel</i>] [<i>paritygroups</i>] [<i>type</i>] [<i>totalcapacity</i>] [<i>freecapacity</i>] [<i>priority</i>] [<i>capacity</i>] [<i>stripesize</i>] [<i>rgnum</i>] [<i>dpnum</i>] [<i>pathinfo</i>] [<i>status</i>] [<i>recoveryinfo</i>]	Specify the item to output. When the specification omitted, it outputs all items. When the -resource rg is specified: <i>raidlevel</i> :RAID level <i>paritygroups</i> :number of parity groups <i>type</i> :drive type <i>totalcapacity</i> :total capacity <i>freecapacity</i> :free capacity <i>priority</i> :priority of DP optimization <i>status</i> :status <i>recoveryinfo</i> :reconstruction progress When the -resource lu is specified: <i>capacity</i> :capacity <i>stripesize</i> :stripesize <i>rgnum</i> :RAID group number <i>dpnum</i> :DP pool number <i>raidlevel</i> :RAID level <i>type</i> :drives type <i>pathinfo</i> :number of paths <i>status</i> :status
-fmt capa tb gb mb block	Expresses the capacity unit. When the specification is omitted, if the capacity is 1 TB or more, it is displayed in TB. If 1 GB or more and less than 1 TB, it is displayed in GB. If less than 1 GB, it is displayed in MB tb:TB gb:GB mb:MB block:block
-nosblu	Specify when not outputting the Sub LU.
-totalsize	Specify when outputting the total capacity of unified Main LU.
-file <i>file_name</i>	Specify the name of the file (path) to output.

Examples

The following example outputs RAID configuration information of array ams2300a1, by configrg.csv file, into the directory in which Storage Navigator Modular 2 has been installed.

```
% auconfigreport -unit ams2300a1 -filetype csv -resource rg -file configrg.csv
The RAID group information will be output to the file.
Are you sure you want to continue? (y/n [n]): y
The RAID group information has been outputted to the file.
%
```

File contents of configrg.csv:

```
RAID Group,RAID Level,Parity Groups,Type,Total,Capcity, Free Capacity,Priority,Status,Reconstruction
Progress
0, 6( 8D+2P), 1, SAS,1 128.0 GB (100.0%), RAID Group Expansion, Normal, N/A
1, 6( 8D+2P), 1, SAS 128.0 GB (100.0%) RAID Group Expansion, Normal, N/A
```

The following example outputs LU information of array ams2300a1, by configlu.csv file into the directory in which Navigator 2 has been installed.

```
% auconfigreport -unit ams2300a1 -filetype csv -resource lu -file configrg.csv
LU information will be output to the file.
Are you sure you want to continue (y/n[n]): y
LU information has been outputted to the file.
%
```

File contents of configlu.csv:

```
LU, Capacity, Stripe,, Size, RAID Group, DP Pool RAID Level,Type, Number of Paths,
Status
0, 50, 0 GB, 256KB, 0 N/A, 6( 8D+2P ),SAS, 0Normal
1, 50, 0 GB, 256KB, 0 N/A, 6( 8D+2P ),SAS, 0Normal
1000, 10, 0 GB, 256KB, 0 N/A, 6( 8D+2P ),SAS, 0Normal
1001, 10, 0 GB, 256KB, 1 N/A, 6( 8D+2P ),SAS, 0Normal
1022, 200, 0 GB, 256KB, 1 N/A, 6( 8D+2P ),SAS, 0Normal
2000, 1, 0 TB, 256KB, N/A 49 6( 8D+2P ),SAS, 0Normal
2001, 1, 0 TB, 256KB, N/A 49 6( 8D+2P ),SAS, 0Normal
```

The following example outputs volume information of array unit hus150 by the config.csv file into the directory in which Navigator 2 has been installed.

```
% auconfigreport -unit hus150 -filetype csv -resource lu -file configrg.csv
LU information will be output to the file.
Are you sure you want to continue (y/n[n]): y
LU information has been outputted to the file.
%
```

File contents of config.csv

```
LU,Capacity, Stripe,,Size, RAID Group,DP PoolRAID Level,Type,Number of Paths,Status,tiermode,Rotational Speed
0,50, 0 GB,256KB, 0 N/A,6( 8D+2P ),SAS, 0 Normal
5,1, 0 GB,256KB, 0 N/A,N/A5( 4D+1P ),SAS, 0 Normal[Quick Formatting(1%)], N/A, 10000rpm
```

The following example outputs DP pool information of an array hus110a1, by configDP.csv file, into the directory in which Navigator 2 has been installed.

```
% auconfigreport -unit hus110a1 -filetype csv -resource dp - file configDP.csv -fmtcapa gb
The DP pool information will be output to the file.
Are you sure you want to continue? (y/n [n]): y
The DP pool information has been output to the file.
%
```

File contents of configDP.csv

% DP Pool,RAID Level,Total Capacity,Consumed Capacity,Type,Status,Reconstruction
Progress,Stripe Size,Needing Preparation Capacity
0,6(8D + 2P),3667,0 GB, 916.0 GB,SSD,Normal,N/A,256KB,4.7 GB
%

Host groups information

This section covers the following commands related to host groups:

- [Referencing/setting host information on page 3-207](#)
- [Referencing/setting host group options on page 3-214](#)
- [Referencing/setting mapping information on page 3-234](#)
- [Referencing/registration/changing/deleting a host group on page 3-237](#)
- [File output of host group information on page 3-240](#)
- [Setting the host group information with a file on page 3-242](#)

Referencing/setting host information

Command name

auhgwwn

Format

9500V

When the LUN Management of the fee-basis option is effective.

```
auhgwwn -unit unit_name --refer
[ -login ctl_no port_no ]
[ -permhg ctl_no port_no -gno group_no | -gname group_name ]
```

```
auhgwwn -unit unit_name --set
[ -hgs ctl_no port_no on | off ]
[ -permhg ctl_no port_no node_name port_name
-gno group_no | -gname group_name [ -wwname wwn_name ] ]
```

When specifying the node name and port name

```
auhgwwn -unit unit_name --assign
-permhg ctl_no port_no node_name port_name
-gno group_no | -gname group_name
```

```
auhgwwn -unit unit_name --rm
[ -perm ctl_no port_no node_name port_name ]
[ -permhg ctl_no port_no node_name port_name
-gno group_no | -gname group_name ]
```

```
auhgwwn -unit unit_name --chg
-rename ctl_no port_no node_name port_name
-gno group_no | -gname group_name
-newwwname new_wwn_name
```

When specifying the wwn name.

```
auhgwwn -unit unit_name --assign
-permhg ctl_no port_no -wwname wwn_name
-gno group_no | -gname group_name
```

```
auhgwwn -unit unit_name --rm
[ -perm ctl_no port_no -wwname wwn_name ]
[ -permhg ctl_no port_no -wwname wwn_name
-gno group_no | -gname group_name ]
```

```
auhgwwn -unit unit_name --chg
-rename ctl_no port_no -wwname wwn_name
-gno group_no | -gname group_name
-newwwname new_wwn_name
```

When the LUN Security of the fee-basis option is effective.

```
auhgwwn -unit unit_name --refer

auhgwwn -unit unit_name --set
[ -lus ctl_no port_no on | off ]
[ -luschk ctl_no port_no inqc | allc ]
[ -perm ctl_no port_no node_name port_name ]
[ -permlu ctl_no port_no node_name port_name lun... ]
[ -permluall ctl_no port_no node_name port_name ]

auhgwwn -unit unit_name --rm
[ -perm ctl_no port_no node_name port_name ]
[ -permlu ctl_no port_no node_name port_name lun... ]
[ -permluall ctl_no port_no node_name port_name ]
```

AMS, WMS, SMS, AMS2000, HUS

```
auhgwwn -unit unit_name --refer
[ -login ctl_no port_no ]
[ -permhg ctl_no port_no -gno group_no | -gname group_name ]
```

```
auhgwwn -unit unit_name --set
[ -hgs ctl_no port_no on | off ]
[ -permhg ctl_no port_no port_name
-gno group_no | -gname group_name [ -wwname wwn_name ] ]
```

When specifying the port name

```
auhgwwn -unit unit_name --assign
```

```

-permhg ctl_no port_no port_name
-gno group_no | -gname group_name

auhgwwn -unit unit_name -rm
[ -perm  ctl_no port_no port_name ]
[ -permhg ctl_no port_no port_name
-gno group_no | -gname group_name ]

auhgwwn -unit unit_name -chg
-rename ctl_no port_no port_name
-gno group_no | -gname group_name
-newwwname new_wwn_name

When specifying the wwn name.
auhgwwn -unit unit_name -assign
-permhg ctl_no port_no -wwname wwn_name
-gno group_no | -gname group_name

auhgwwn -unit unit_name -rm
[ -perm  ctl_no port_no -wwname wwn_name ]
[ -permhg ctl_no port_no -wwname wwn_name
-gno group_no | -gname group_name ]

auhgwwn -unit unit_name -chg
-rename ctl_no port_no -wwname wwn_name
-gno group_no | -gname group_name
-newwwname new_wwn_name

```

Description

This command references or sets the host information.

Options

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " " (space). Space in front and back of the character string is removed.
-refer	Displays the host information.
-set	Sets the host information.
-rm	Deletes the host information.
-chg	Changes the host information.
-assign	Assigns the host information to the specified host group.
-login <i>ctl_no</i> <i>port_no</i>	Displays the host information that is logged in on the specified port. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H)

Option	Description
-permhg <i>ctl_no</i> <i>port_no</i>	When the -refer option is specified: Displays the host information that has been and can be assigned to the specified host group. Specification of the -gno or -gname option is indispensable. When the -set option is specified: Specify the host information to be assigned to the specified host group. Specification of the -wname option is indispensable. Specification of the -gno or -gname option is indispensable. When the -assign option is specified: Specify the host information which can be assigned to the host group from that logged in on the specified port. Specification of the -wname option is indispensable. Specification of the -gno or -gname option is indispensable. When the -rm option is specified: Specify the host information to be deleted from that which has been assigned to the specified host group. Specification of the -wname option is indispensable. Specification of the -gno or -gname option is indispensable. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i>: Port number (A, B, C, D, E, F, G, H)
-hgs <i>ctl_no</i> <i>port_no</i> on off	Specify whether to validate or invalidate the host group security of the specified port. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i>: Port number (A, B, C, D, E, F, G, H) on : Enables the host group security. off : Disables the host group security.
-perm <i>ctl_no</i> <i>port_no</i>	Specify the host information to be deleted from that logged in on the specified port. Specification of the -wname option is indispensable. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H)

Option	Description
-rename <i>ctl_no</i> <i>port_no</i>	Specify the host information whose WWN name is to be changed from that which has been assigned to the specified host group. Specification of the -gno or -gname option is indispensable. Specification of the -wname and -newwwname option is indispensable. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H)
-wname <i>wwn_name</i>	Specify a WWN name of the host. Space in front and in the rear of the character string is removed. Cannot specify spaces only. <i>wwn_name</i> : WWN name (See Note 1)
-gno <i>group_no</i>	Specify a host group number. <i>group_no</i> : Host group number
-gname <i>group_name</i>	Specify a host group name. <i>group_name</i> : Host group name (See Note 1)
-newwwname <i>new_wwn_name</i>	Specify the changed WWN name. <i>new_wwn_name</i> : WWN name (See Note 1)
9500V only:	
-permhg <i>ctl_no</i> <i>port_no</i> <i>node_name</i> <i>port_name</i>	When the -set option is specified: Specify the host information to be assigned to the specified host group. Specification of the -gno or -gname option is indispensable. When the -assign option is specified: Specify the host information which can be assigned to the host group from that logged in on the specified port. Specification of the -gno or -gname option is indispensable. When the -rm option is specified: Specify the host information to be deleted from that which has been assigned to the specified host group. Specification of the -gno or -gname option is indispensable. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D) <i>node_name</i> : Node name of the host (16 hexadecimal characters) <i>port_name</i> : Port name of the host (16 hexadecimal characters)

Option	Description
-perm <i>ctl_no</i> <i>port_no</i> <i>node_name</i> <i>port_name</i>	Specify the host information to be deleted from that logged in on the specified port. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D) <i>node_name</i> : Node name of the host (16 hexadecimal characters) <i>port_name</i> : Port name of the host (16 hexadecimal characters)
-rename <i>ctl_no</i> <i>port_no</i> <i>node_name</i> <i>port_name</i>	Specify the host information whose WWN name is to be changed from that which has been assigned to the specified host group. Specification of the -gno or -gname option is indispensable. Specification of the -newwwname option is indispensable. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D) <i>node_name</i> : Node name of the host (16 hexadecimal characters) <i>port_name</i> : Port name of the host (16 hexadecimal characters)
-lus <i>ctl_no port_no</i> on off	Specify whether the LUN security of the specified port is enabled or disabled. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D) on : Enables the LUN Security. off : Disables the LUN Security.
-luschk <i>ctl_no</i> <i>port_no</i> inqc allc	Specify the LUN security check level of the specified port. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D) inqc : Check with an INQUIRY SCSI command. allc : Check with all the SCSI commands.
-perm <i>ctl_no</i> <i>port_no</i> <i>node_name</i> <i>port_name</i>	When the -set option is specified: Specify host information (node name and port name) that can be accessed by the specified port. When the -rm option is specified: Specify the host information to be deleted from the host information (node name and port name) that can be accessed by the specified port. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D) <i>node_name</i> : Node name of the host (16 hexadecimal characters) <i>port_name</i> : Port name of the host (16 hexadecimal characters)

Option	Description
-permlu <i>ctl_no</i> <i>port_no</i> <i>node_name</i> <i>port_name lun...</i>	When the -set option is specified: When using the LUN security function at a specified port, specifies LUs, to which the host is permitted to access, into host information registered with the -perm option (multiple LUs can be specified). Host information and LUN security are not allowed to be registered at the same time. When the -rm option is specified: Specify the LUNs whose access permission is to be deleted from the LUN security set by the specified port. (Multiple LUs can be specified.) <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D) <i>node_name</i>: Node name of the host (16 hexadecimal characters) <i>port_name</i>: Port name of the host (16 hexadecimal characters) <i>lun...</i> : LU number
-permluall <i>ctl_no</i> <i>port_no</i> <i>node_name</i> <i>port_name</i>	When the -set option is specified: When using the LUN security function at a specified port, specifies host information that is already registered with the -perm option, which specifies permission to access to all LUs. Host information and LUN security are not allowed to be registered at the same time. When the -rm option is specified: Specify the host information whose access permission is to be deleted from the LUN security set by the specified port. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D) <i>node_name</i>: Node name of the host (16 hexadecimal characters) <i>port_name</i>: Port name of the host (16 hexadecimal characters)

Option	Description
-permhg <i>ctl_no</i> <i>port_no port_name</i>	When the -set option is specified: - Specify the host information to be assigned to the specified host group. - Specification of the -gno or -gname option is indispensable. - When the -assign option is specified: Specify the host information which can be assigned to the host group from that logged in on the specified port. - Specification of the -gno or -gname option is indispensable. When the -rm option is specified: - Specify the host information to be deleted from that which has been assigned to the specified host group. - Specification of the -gno or -gname option is indispensable. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H) <i>port_name</i>: Port name of the host (16 hexadecimal characters)
-perm <i>ctl_no</i> <i>port_no port_name</i>	Specify the host information to be deleted from that logged in on the specified port. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H) <i>port_name</i>: Port name of the host (16 hexadecimal characters)
-rename <i>ctl_no</i> <i>port_no port_name</i>	Specify the host information whose WWN name is to be changed from that which has been assigned to the specified host group. Specification of the -gno or -gname option is indispensable. Specification of the -newwwname option is indispensable. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H) <i>port_name</i>: Port name of the host (16 hexadecimal characters)

Example

The following example displays the host information of an array ams500 when the LUN Manager is effective.

```
% auhgwwn -unit ams500 -refer
Port 0A Host Group Security ON
Detected WWN
  Name      Port Name
  ams500srv  210100E08B3E031F
  AMS500SRV  210000E08B8F4CC7
              210000E08B1E031F
Assigned WWN
  Name      Port Name      Host Group
  ams500srv  210100E08B3E031F 000:AMS500srv
  AMS500SRV  210000E08B8F4CC7 001:ams500srv-CTL0
Assignable WWN
  Name      Port Name
              210000E08B1E031F
Port 1A Host Group Security ON
:
%
```

Referencing/setting host group options

Command name

auhgopt

Format

9500V, AMS, WMS, SMS, AMS2000, HUS
auhgopt -unit unit_name -refer

9500V

When specifying per host group option.

```
auhgopt -unit unit_name -set
[ -HostConnection          ctl_no port_no group_no
                             standard | OpenVMS | TRESPASS | WolfPack ]
[ -SPC2                    ctl_no port_no group_no enable | disable ]
[ -SameNodeName            ctl_no port_no group_no enable | disable ]
[ -TruCluster              ctl_no port_no group_no enable | disable ]
[ -pathswAPG               ctl_no port_no group_no enable | disable ]
[ -pathswAP                ctl_no port_no group_no enable | disable ]
[ -pathswAA                ctl_no port_no group_no enable | disable ]
[ -PIDNoRep                ctl_no port_no group_no enable | disable ]
[ -PIDConv                ctl_no port_no group_no enable | disable ]
[ -NoRSVConf               ctl_no port_no group_no enable | disable ]
[ -ftSRV2                  ctl_no port_no group_no enable | disable ]
[ -SRCReadReject           ctl_no port_no group_no enable | disable ]
[ -UASuppress              ctl_no port_no group_no enable | disable ]
[ -HISUP                   ctl_no port_no group_no enable | disable ]
[ -CCHS                    ctl_no port_no group_no enable | disable ]
[ -HPUX2                   ctl_no port_no group_no enable | disable ]
[ -ProdidDF400             ctl_no port_no group_no enable | disable ]
[ -NACA                    ctl_no port_no group_no enable | disable ]
[ -SUNCluster              ctl_no port_no group_no enable | disable ]
[ -PRSV                    ctl_no port_no group_no enable | disable ]
[ -TargetReset             ctl_no port_no group_no enable | disable ]
[ -Reserve                 ctl_no port_no group_no enable | disable ]
[ -LUReset                 ctl_no port_no group_no enable | disable ]
[ -TPRLO                   ctl_no port_no group_no enable | disable ]
```

When specifying per host group.

```
auhgopt -unit unit_name -set ctl_no port_no
-gno group_no | -gname group_name
[ -HostConnection          standard | OpenVMS | TRESPASS | WolfPack ]
[ -SPC2                    enable | disable ]
[ -SameNodeName            enable | disable ]
[ -TruCluster              enable | disable ]
[ -pathswAPG               enable | disable ]
[ -pathswAP                enable | disable ]
[ -pathswAA                enable | disable ]
[ -PIDNoRep                enable | disable ]
```

-PIDConv	enable	disable
-NoRSVConf	enable	disable
-ftSRV2	enable	disable
-SRCReadReject	enable	disable
-UASuppress	enable	disable
-HISUP	enable	disable
-CCHS	enable	disable
-HPUX2	enable	disable
-ProdidDF400	enable	disable
-NACA	enable	disable
-SUNCluster	enable	disable
-PRSV	enable	disable
-TargetReset	enable	disable
-Reserve	enable	disable
-LUReset	enable	disable
-TPRLO	enable	disable

AMS, WMS

When specifying per host group option.

```

auhgopt -unit unit_name -set
[ -HostConnection          ctl_no port_no group_no
                             standard | OpenVMS | TRESPASS | WolfPack ]
[ -HP                      ctl_no port_no group_no enable | disable ]
[ -PSUEREadReject          ctl_no port_no group_no enable | disable ]
[ -UASuppress              ctl_no port_no group_no enable | disable ]
[ -NACA                    ctl_no port_no group_no enable | disable ]
[ -HISUPOff                ctl_no port_no group_no enable | disable ]
[ -ResetPropagation        ctl_no port_no group_no enable | disable ]
[ -UniqueReserve1          ctl_no port_no group_no enable | disable ]
[ -ASLReportAPG            ctl_no port_no group_no enable | disable ]
[ -ASLReportAP             ctl_no port_no group_no enable | disable ]
[ -ASLReportAA             ctl_no port_no group_no enable | disable ]
[ -PIDNoRep                ctl_no port_no group_no enable | disable ]
[ -PIDConv                 ctl_no port_no group_no enable | disable ]
[ -TruCluster              ctl_no port_no group_no enable | disable ]
[ -SerialResponse          ctl_no port_no group_no enable | disable ]
[ -SameNodeName            ctl_no port_no group_no enable | disable ]
[ -CCHS                    ctl_no port_no group_no enable | disable ]
[ -SPC2                    ctl_no port_no group_no enable | disable ]
[ -SvolDisableAdvance      ctl_no port_no group_no enable | disable ]

```

When specifying per host group.

```

auhgopt -unit unit_name -set ctl_no port_no
-gno group_no | -gname group_name
[ -HostConnection          standard | OpenVMS | TRESPASS | WolfPack ]
[ -HP                      enable | disable ]
[ -PSUEREadReject          enable | disable ]
[ -UASuppress              enable | disable ]
[ -NACA                    enable | disable ]
[ -HISUPOff                enable | disable ]
[ -ResetPropagation        enable | disable ]
[ -UniqueReserve1          enable | disable ]
[ -ASLReportAPG            enable | disable ]
[ -ASLReportAP             enable | disable ]
[ -ASLReportAA             enable | disable ]
[ -PIDNoRep                enable | disable ]
[ -PIDConv                 enable | disable ]
[ -TruCluster              enable | disable ]
[ -SerialResponse          enable | disable ]
[ -SameNodeName            enable | disable ]
[ -CCHS                    enable | disable ]
[ -SPC2                    enable | disable ]
[ -SvolDisableAdvance      enable | disable ]

```

SMS

When specifying per host group option.

```

auhgopt -unit unit_name -set
[ -HostConnection          ctl_no port_no group_no
                             standard | OpenVMS | TRESPASS | WolfPack ]
[ -HP                      ctl_no port_no group_no enable | disable ]
[ -PSUEREadReject          ctl_no port_no group_no enable | disable ]
[ -ModeParamChanged        ctl_no port_no group_no enable | disable ]
[ -NACA                    ctl_no port_no group_no enable | disable ]
[ -TaskIsolation           ctl_no port_no group_no enable | disable ]
[ -UniqueReserve1          ctl_no port_no group_no enable | disable ]
[ -PIDConv                 ctl_no port_no group_no enable | disable ]
[ -TruCluster              ctl_no port_no group_no enable | disable ]
[ -SerialResponse          ctl_no port_no group_no enable | disable ]
[ -SameNodeName            ctl_no port_no group_no enable | disable ]

```

```
[ -CCHS                ctl_no port_no group_no enable | disable ]
[ -InquirySerial       ctl_no port_no group_no enable | disable ]
[ -NOPInSuppress       ctl_no port_no group_no enable | disable ]
[ -SvolDisableAdvance  ctl_no port_no group_no enable | disable ]
[ -DiscoveryCHAP       ctl_no port_no group_no enable | disable ]
[ -UACHange            ctl_no port_no group_no enable | disable ]
[ -UNMAPShortLength    ctl_no port_no group_no enable | disable ]
[ -ChangeRespRepli     ctl_no port_no group_no enable | disable ]
[ -WriteSameReject     ctl_no port_no group_no enable | disable ]
[ -FullProvisioning    ctl_no port_no group_no enable | disable ]
[ -UNMAPReject         ctl_no port_no group_no enable | disable ]
```

When specifying per host group.

```
auhgopt -unit unit_name -set ctl_no port_no
      -gno group_no | -gname group_name
      [ -HostConnection      standard | OpenVMS | TRESPASS | WolfPack ]
      [ -HP                  enable | disable ]
      [ -PSUReadReject       enable | disable ]
      [ -ModeParamChanged    enable | disable ]
      [ -NACA                 enable | disable ]
      [ -TaskIsolation       enable | disable ]
      [ -UniqueReserve1      enable | disable ]
      [ -PIDConv             enable | disable ]
      [ -TruCluster          enable | disable ]
      [ -SerialResponse      enable | disable ]
      [ -SameNodeName        enable | disable ]
      [ -CCHS                enable | disable ]
      [ -InquirySerial       enable | disable ]
      [ -NOPInSuppress       enable | disable ]
      [ -SvolDisableAdvance  enable | disable ]
      [ -DiscoveryCHAP       enable | disable ]
      [ -UniqueExtendedCOPY  ctl_no port_no group_no enable | disable ]
      [ -UniqueWriteSame     ctl_no port_no group_no enable | disable ]
      [ -DPDepletionReply    ctl_no port_no group_no enable | disable ]
      [ -UACHange            ctl_no port_no group_no enable | disable ]
      [ -UNMAPShortLength    ctl_no port_no group_no enable | disable ]
      [ -ChangeRespRepli     ctl_no port_no group_no enable | disable ]
      [ -WriteSameReject     ctl_no port_no group_no enable | disable ]
      [ -FullProvisioning    ctl_no port_no group_no enable | disable ]
      [ -UNMAPReject         ctl_no port_no group_no enable | disable ]
```

When specifying simple setting option.

```
auhgopt -unit unit_name -set ctl_no port_no
      -gno group_no | gname group_name
      -platformNotSpecified | HP | Solaris | AIX | Linux |
      Windows | VMware | NetWare
      -middlewareNotSpecified | VCS | TruCluster
```

AMS2000, HUS

When specifying per host group option.

```
auhgopt -unit unit_name -set
      [ -HostConnection      ctl_no port_no group_no
      standard | OpenVMS | TRESPASS | WolfPack ]
      [ -HP                  ctl_no port_no group_no enable | disable ]
      [ -PSUReadReject       ctl_no port_no group_no enable | disable ]
      [ -ModeParamChanged    ctl_no port_no group_no enable | disable ]
      [ -NACA                 ctl_no port_no group_no enable | disable ]
      [ -TaskIsolation       ctl_no port_no group_no enable | disable ]
      [ -UniqueReserve1      ctl_no port_no group_no enable | disable ]
      [ -PIDConv             ctl_no port_no group_no enable | disable ]
      [ -TruCluster          ctl_no port_no group_no enable | disable ]
      [ -SerialResponse      ctl_no port_no group_no enable | disable ]
      [ -SameNodeName        ctl_no port_no group_no enable | disable ]
      [ -CCHS                ctl_no port_no group_no enable | disable ]
      [ -InquirySerial       ctl_no port_no group_no enable | disable ]
      [ -NOPInSuppress       ctl_no port_no group_no enable | disable ]
      [ -SvolDisableAdvance  ctl_no port_no group_no enable | disable ]
      [ -DiscoveryCHAP       ctl_no port_no group_no enable | disable ]
      [ -UniqueExtendedCOPY  ctl_no port_no group_no enable | disable ]
      [ -UniqueWriteSame     ctl_no port_no group_no enable | disable ]
      [ -DPDepletionReply    ctl_no port_no group_no enable | disable ]
      [ -UACHange            ctl_no port_no group_no enable | disable ]
```

When specifying per host group option.

```
auhgopt -unit unit_name -set
      [ -HostConnection      standard | OpenVMS | TRESPASS | WolfPack ]
      [ -HP                  enable | disable ]
      [ -PSUReadReject       enable | disable ]
      [ -ModeParamChanged    enable | disable ]
```

```
[ -NACA enable | disable ]
[ -TaskIsolation enable | disable ]
[ -UniqueReserve1 enable | disable ]
[ -PIDConv enable | disable ]
[ -TruCluster enable | disable ]
[ -SerialResponse enable | disable ]
[ -SameNodeName enable | disable ]
[ -CCHS enable | disable ]
[ -InquirySerial enable | disable ]
[ -NOPInSuppress enable | disable ]
[ -SvolDisableAdvance enable | disable ]
[ -DiscoveryCHAP enable | disable ]
[ -UniqueExtendedCOPY enable | disable ]
[ -UniqueWriteSame enable | disable ]
[ -DPDepletionReply enable | disable ]
```

```
aughopt-unit uni_name -set ctl_no port_no
-gno group_no | -gname group_name
-platform NotSpecified | HP | Solaris | AIX | Linux |
Windows | VMware | NetWare
-middleware NotSpecified | VCS | TruCluster
```

Description

This command references or sets the host group options.

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of an array unit in which the host group options are to be referenced or set. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-" (minus), "_" (underline), "." (period), "@", or " (space)". Space in front and in the rear of the character string is removed.
-refer	References the host group options.

When specifying per option (For 9500V, AMS, WMS, SMS, and AMS2000)

Option	Description
-set	Sets the host group options.
-HostConnection <i>ctl_no port_no group_no</i> standard OpenVMS TRESPASS WolfPack	Specify the mode to be emulated. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H) <i>group_no</i> : Host Group number standard: Open system emulation mode OpenVMS : Open VMS mode TRESPASS: TRESPASS mode WolfPack: WolfPack mode

-SameNodeName <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the Same Node Name mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the Same Node Name mode. <i>disable</i> : Disables the Same Node Name mode.
-TruCluster <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the Tru Cluster Connection mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the Tru Cluster Connection mode. <i>disable</i> : Disables the Tru Cluster Connection mode.
-PIDConv <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the Port-ID Conversion mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the Port-ID Conversion mode. <i>disable</i> : Disables the Port-ID Conversion mode.
-CCHS <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the CCHS convert mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the CCHS convert mode. <i>disable</i> : Disables the CCHS convert mode.
-NACA <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the NACA mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the NACA mode. <i>disable</i> : Disables the NACA mode.

When specifying per option (9500V only)

Option	Description
--------	-------------

-pathswAPG <i>ctl_no</i> <i>port_no group_no</i> enable disable	Specify whether to set the Path Switch mode (Active/ Passive Group) effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. enable : Enables the Path Switch mode (Active/ Passive Group). disable : Disables the Path Switch mode (Active/ Passive Group).
-pathswAP <i>ctl_no</i> <i>port_no group_no</i> enable disable	Specify whether to set the Path Switch mode (Active/ Passive) effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. enable : Enables the Path Switch mode (Active/ Passive). disable : Disables the Path Switch mode (Active/ Passive).
-pathswAA <i>ctl_no</i> <i>port_no group_no</i> enable disable	Specify whether to set the Path Switch mode (Active/ Active) effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. enable : Enables the Path Switch mode (Active/ Active). disable : Disables the Path Switch mode (Active/ Active).
-NoRSVConf <i>ctl_no</i> <i>port_no group_no</i> enable disable	Specify whether to set the No_RSV_Conf mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. enable : Enables the No_RSV_Conf mode. disable : Disables the No_RSV_Conf mode.
-ftSRV2 <i>ctl_no</i> <i>port_no group_no</i> enable disable	Specify whether to set the ftServer Connection mode 2 effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. enable : Enables the ftServer Connection mode 2. disable : Disables the ftServer Connection mode 2.

-SRCReadReject <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the SRC Read Command Reject mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the SRC Read Command Reject mode. <i>disable</i> : Disables the SRC Read Command Reject mode.
-HISUP <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the HISUP mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the HISUP mode. <i>disable</i> : Disables the HISUP mode.
-HPUX2 <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the HP connection mode 2 effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the HP connection mode 2. <i>disable</i> : Disables the HP connection mode 2.
-ProdidDF400 <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the Product ID DF400 mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the Product ID DF400 mode. <i>disable</i> : Disables the Product ID DF400 mode.
-SUNCluster <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the SUN Cluster Connection mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the SUN Cluster Connection mode. <i>disable</i> : Disables the SUN Cluster Connection mode.
-PRSV <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the Persistent RSV Cluster mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the Persistent RSV Cluster mode. <i>disable</i> : Disables the Persistent RSV Cluster mode.

-TargetReset <i>ctl_no</i> <i>port_no group_no</i> enable disable	Specify whether to set the Target reset mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. enable : Enables the Target reset mode. disable : Disables the Target reset mode.
-Reserve <i>ctl_no</i> <i>port_no group_no</i> enable disable	Specify whether to set the Reserve mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. enable : Enables the Reserve mode. disable : Disables the Reserve mode.
-LUReset <i>ctl_no</i> <i>port_no group_no</i> enable disable	Specify whether to set the LU reset mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. enable : Enables the LU reset mode. disable : Disables the LU reset mode.
-TPRLO <i>ctl_no</i> <i>port_no group_no</i> enable disable	Specify whether to set the Third Party Process Logout mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. enable : Enables the Third Party Process Logout mode. disable : Disables the Third Party Process Logout mode.

When specifying per option (For 9500V, AMS and WMS)

Option	Description
-SPC2 <i>ctl_no</i> <i>port_no group_no</i> enable disable	Specify whether to set the SPC-2 Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. enable : Enables the SPC-2 Mode. disable : Disables the SPC-2 Mode.
-PIDNoRep <i>ctl_no</i> <i>port_no group_no</i> enable disable	Specify whether to set the Port-ID No Report mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. enable : Enables the Port-ID No Report mode. disable : Disables the Port-ID No Report mode.

-UASuppress <i>ctl_no port_no group_no</i> enable disable	Specify whether or not to suppress a unit attention (06/ 2A00). <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. enable : Suppress the unit attention. disable : Does not suppress the unit attention.
---	---

When specifying per option (For AMS and WMS)

-HISUPOff <i>ctl_no port_no group_no</i> enable disable	Specify whether to set the HISUP OFF Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. enable : Enables the HISUP OFF Mode. disable : Disables the HISUP OFF Mode.
-ResetPropagation <i>ctl_no port_no group_no</i> enable disable	Specify whether to set the Reset Propagation Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. enable : Enables the Reset Propagation Mode. disable : Disables the Reset Propagation Mode.
-ASLReportAPG <i>ctl_no port_no group_no</i> enable disable	Specify whether to set the ASL Report Mode (Active/ Passive Group) effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. enable : Enables the ASL Report Mode (Active/ Passive Group). disable : Disables the ASL Report Mode (Active/ Passive Group).
-ASLReportAP <i>ctl_no port_no group_no</i> enable disable	Specify whether to set the ASL Report Mode (Active/ Passive) effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. enable : Enables the ASL Report Mode (Active/ Passive). disable : Disables the ASL Report Mode (Active/ Passive).

-ASLReportAA <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the ASL Report Mode (Active/ Active) effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the ASL Report Mode (Active/ Active). <i>disable</i> : Disables the ASL Report Mode (Active/ Active).
---	---

When specifying per option (For AMS, WMS, SMS, and AMS2000)

-HP <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the HP-UX Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the HP-UX Mode. <i>disable</i> : Disables the HP-UX Mode.
-PSUEReadReject <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the PSUE Read Reject Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the PSUE Read Reject Mode. <i>disable</i> : Disables the PSUE Read Reject Mode.
-UniqueReserve1 <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the Unique Reserve Mode 1 effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the Unique Reserve Mode 1. <i>disable</i> : Disables the Unique Reserve Mode 1.
-SerialResponse <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the Product Serial Response Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the Product Serial Response Mode. <i>disable</i> : Disables the Product Serial Response Mode.

- SvolDisableAdvanced <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the S-VOL Disable Advanced Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the S-VOL Disable Advanced Mode. <i>disable</i> : Disables the S-VOL Disable Advanced Mode.
---	---

When specifying per option (For SMS and AMS2000)

Option	Description
- ModeParamChanged <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the Mode Parameters Changed Notification Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the Mode Parameters Changed Notification Mode. <i>disable</i> : Disables the Mode Parameters Changed Notification Mode.
-TaskIsolation <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the Task Management Isolation Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the Task Management Isolation Mode. <i>disable</i> : Disables the Task Management Isolation Mode.
-InquirySerial <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the Inquiry Serial Number Conversion Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the Inquiry Serial Number Conversion Mode. <i>disable</i> : Disables the Inquiry Serial Number Conversion Mode.
-NOPInSuppress <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the NOP-In Suppress Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the NOP-In Suppress Mode. <i>disable</i> : Disables the NOP-In Suppress Mode.

-DiscoveryCHAP <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the Discovery CHAP Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. <i>enable</i> : Enables the Discovery CHAP Mode. <i>disable</i> : Disables the Discovery CHAP Mode
-UChange <i>ccl_no port_no group_no enable disable</i>	Specify whether to set the Unit Retention Change Mode effective or ineffective. <i>ctl_no</i> :: Controller number (0, 1) <i>port_no</i> :: Port number (A, B, C, D, E, F, G, H). <i>group_no</i> :: Host Group number. <i>enable</i> :: Enables the Unit Attention Change Mode. <i>disable</i> :: Disables the Unit Attention Change Mode.

When specifying per option (For AMS2000)

- UniqueExtendedCo py <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the Unique Extended COPY Mode effective or ineffective <i>ctl_no</i> : Controller number (0, 1), <i>port_no</i> :Port number (A, B, C, D, E, F, G, H) <i>group_no</i> : Host Group number <i>enable</i> : Enables the Unique Extended COPY Mode. <i>disable</i> : Disables the Unique Extended COPY Mode.
-UniqueWriteSame <i>ctl_no port_no group_no enable disable</i>	Specify whether to set the Unique Write Same Mode effective or ineffective <i>ctl_no</i> : Controller number (0, 1), <i>port_no</i> :Port number (A, B, C, D, E, F, G, H) <i>group_no</i> : Host Group number <i>enable</i> : Enables the Unique Write Same Mode. <i>disable</i> : Disables the Unique Write Same Mode
-DPDepletionReply <i>ctl_no port_no target_no enable disable</i>	Specify whether to set the DP Depletion Detail Reply Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1), <i>port_no</i> :Port number (A, B, E, F) <i>target_no</i> : Target number <i>enable</i> : Enables the DP Depletion Detail Reply Mode. <i>disable</i> : Disables the DP Depletion Detail Reply Mode

When specifying per host group (For 9500V, AMS, WMS, SMS, and AMS2000)

Option	Description
-set <i>ctl_no port_no</i>	Sets the host group options. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H).

-gno <i>group_no</i>	Specify a host group number. <i>group_no</i> : Host group number.
-gname <i>group_name</i>	Specify a host group name. <i>group_name</i> : Host group name
-HostConnection standard OpenVMS TRESPASS WolfPack	Specify the mode to be emulated. standard: Open system emulation mode OpenVMS : Open VMS mode TRESPASS: TRESPASS mode WolfPack: WolfPack mod
-SameNodeName enable disable	Specify whether to set the Same Node Name mode effective or ineffective. enable : Enables the Same Node Name mode. disable : Disables the Same Node Name mode.
-TruCluster enable disable	Specify whether to set the Tru Cluster Connection mode effective or ineffective. enable : Enables the Tru Cluster Connection mode. disable : Disables the Tru Cluster Connection mode
-PIDConv enable disable	Specify whether to set the Port-ID Conversion mode effective or ineffective. enable : Enables the Port-ID Conversion mode. disable : Disables the Port-ID Conversion mode.
-CCHS enable disable	Specify whether to set the CCHS convert mode effective or ineffective. enable : Enables the CCHS convert mode. disable : Disables the CCHS convert mode.
-NACA enable disable	Specify whether to set the NACA mode effective or ineffective. enable : Enables the NACA mode. disable : Disables the NACA mode.

When specifying per host group (9500V only)

Option	Description
-pathswAPGenable disable	Specify whether to set the Path Switch mode (Active/Passive Group) effective or ineffective. enable : Enables the Path Switch mode (Active/Passive Group). disable : Disables the Path Switch mode (Active/Passive Group).

-pathswAP enable disable	Specify whether to set the Path Switch mode (Active/Passive) effective or ineffective. enable : Enables the Path Switch mode (Active/Passive). disable : Disables the Path Switch mode (Active/Passive).
-pathswAA enable disable	Specify whether to set the Path Switch mode (Active/Active) effective or ineffective. enable : Enables the Path Switch mode (Active/Active). disable : Disables the Path Switch mode (Active/Active).
-NoRSVConf enable disable	Specify whether to set the No_RSV_Conf mode effective or ineffective. enable : Enables the No_RSV_Conf mode. disable : Disables the No_RSV_Conf mode.
-ftSRV2 enable disable	Specify whether to set the ftServer Connection mode 2 effective or ineffective. enable : Enables the ftServer Connection mode 2. disable : Disables the ftServer Connection mode 2.
-SRCReadReject enable disable	Specify whether to set the SRC Read Command Reject mode effective or ineffective. enable : Enables the SRC Read Command Reject mode. disable : Disables the SRC Read Command Reject mode.
-HISUP enable disable	Specify whether to set the HISUP mode effective or ineffective. enable : Enables the HISUP mode. disable : Disables the HISUP mode.
-HPUX2 enable disable	Specify whether to set the HP connection mode 2 effective or ineffective. enable : Enables the HP connection mode 2. disable : Disables the HP connection mode 2.
-ProdIDDF400 enable disable	Specify whether to set the Product ID DF400 mode effective or ineffective. enable : Enables the Product ID DF400 mode. disable : Disables the Product ID DF400 mode.

-SUNCluster enable disable	Specify whether to set the SUN Cluster Connection mode effective or ineffective. enable : Enables the SUN Cluster Connection mode. disable : Disables the SUN Cluster Connection mode.
-PRSV enable disable	Specify whether to set the Persistent RSV Cluster mode effective or ineffective. enable : Enables the Persistent RSV Cluster mode. disable : Disables the Persistent RSV Cluster mode.
-TargetReset enable disable	Specify whether to set the Target reset mode effective or ineffective. enable : Enables the Target reset mode. disable : Disables the Target reset mode.
-Reserve enable disable	Specify whether to set the Reserve mode effective or ineffective. enable : Enables the Reserve mode. disable : Disables the Reserve mode.
-LUReset enable disable	Specify whether to set the LU reset mode effective or ineffective. enable : Enables the LU reset mode. disable : Disables the LU reset mode.
-TPRLO enable disable	Specify whether to set the Third Party Process Logout mode effective or ineffective. enable : Enables the Third Party Process Logout mode. disable : Disables the Third Party Process Logout mode

When specifying per host group (For 9500V, AMS and WMS)

Option	Description
-SPC2 <i>ctl_no</i> <i>port_no group_no</i> enable disable	Specify whether to set the SPC-2 Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D). <i>group_no</i> : Host Group number. enable : Enables the SPC-2 Mode. disable : Disables the SPC-2 Mode.

-PIDNoRep enable disable	Specify whether to set the Port-ID No Report mode effective or ineffective. enable : Enables the Port-ID No Report mode. disable : Disables the Port-ID No Report mode.
-UASuppress enable disable	Specify whether or not to suppress a unit attention (06/2A00). enable : Suppress the unit attention. disable : Does not suppress the unit attention.

When specifying per host group (For AMS and WMS)

-HISUPOff enable disable	Specify whether to set the HISUP OFF Mode effective or ineffective. enable : Enables the HISUP OFF Mode. disable : Disables the HISUP OFF Mode.
-ResetPropagation enable disable	Specify whether to set the Reset Propagation Mode effective or ineffective. enable : Enables the Reset Propagation Mode. disable : Disables the Reset Propagation Mode.
-ASLReportAPG enable disable	Specify whether to set the ASL Report Mode (Active/Passive Group) effective or ineffective. enable : Enables the ASL Report Mode (Active/Passive Group). disable : Disables the ASL Report Mode (Active/Passive Group).
-ASLReportAP enable disable	Specify whether to set the ASL Report Mode (Active/Passive) effective or ineffective. enable : Enables the ASL Report Mode (Active/Passive). disable : Disables the ASL Report Mode (Active/Passive).
-ASLReportAA enable disable	Specify whether to set the ASL Report Mode (Active/Active) effective or ineffective. enable : Enables the ASL Report Mode (Active/Active). disable : Disables the ASL Report Mode (Active/Active).

When specifying per host group (For AMS, WMS, SMS and AMS2000)

Option	Description
--------	-------------

-HP enable disable	Specify whether to set the HP-UX Mode effective or ineffective. enable : Enables the HP-UX Mode. disable : Disables the HP-UX Mode.
-PSUEReadReject enable disable	Specify whether to set the PSUE Read Reject Mode effective or ineffective. enable : Enables the PSUE Read Reject Mode. disable : Disables the PSUE Read Reject Mode.
-UniqueReserve1 enable disable	Specify whether to set the Unique Reserve Mode 1 effective or ineffective. enable : Enables the Unique Reserve Mode 1. disable : Disables the Unique Reserve Mode 1.
-SerialResponse enable disable	Specify whether to set the Product Serial Response Mode effective or ineffective. enable : Enables the Product Serial Response Mode. disable : Disables the Product Serial Response Mode.
- SvolDisableAdvanced enable disable	Specify whether to set the S-VOL Disable Advanced Mode effective or ineffective. enable : Enables the S-VOL Disable Advanced Mode. disable : Disables the S-VOL Disable Advanced Mode.

When specifying per host group (For SMS and AMS2000)

Option	Description
-ModeParamChanged <i>ctl_no port_no group_no</i> enable disable	Specify whether to set the Mode Parameters Changed Notification Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. enable : Enables the Mode Parameters Changed Notification Mode. disable : Disables the Mode Parameters Changed Notification Mode.

-TaskIsolation <i>ctl_no</i> <i>port_no group_no</i> enable disable	Specify whether to set the Task Management Isolation Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. enable : Enables the Task Management Isolation Mode. disable : Disables the Task Management Isolation Mode.
-InquirySerial <i>ctl_no</i> <i>port_no group_no</i> enable disable	Specify whether to set the Inquiry Serial Number Conversion Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. enable : Enables the Inquiry Serial Number Conversion Mode. disable : Disables the Inquiry Serial Number Conversion Mode
-NOPInSuppress <i>ctl_no port_no</i> <i>group_no</i> enable disable	Specify whether to set the NOP-In Suppress Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. enable : Enables the NOP-In Suppress Mode. disable : Disables the NOP-In Suppress Mode.
-DiscoveryCHAP <i>ctl_no port_no</i> <i>group_no</i> enable disable	Specify whether to set the Discovery CHAP Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : Host Group number. enable : Enables the Discovery CHAP Mode. disable : Disables the Discovery CHAP Mode.
-UChange <i>ccl _no</i> <i>port_no group_no</i> enable disable	Specify whether to set the Unit Retention Change Mode effective or ineffective. <i>ctl_no</i> :: Controller number (0, 1) <i>port_no</i> : : Port number (A, B, C, D, E, F, G, H). <i>group_no</i> : : Host Group number. enable: : Enables the Unit Attention Change Mode. disable : Disables the Unit Attention Change Mode.
-platform NotSpecified HP Solaris AIX Linux Windows VMware NetWare	Specify the Platform. NotSpecified: not specified HP: HP-UX Solaris: Solaris AIX: AIX Linux: Linux Windows: Windows VMware: VMware NetWare: NetWare

-middleware NotSpecified VCS TrueCluster	Specify the Middleware. NotSpecified: not specified VCS: VCS TruCluster: Tru Cluster
--	---

When specifying per option (For AMS2000)

Option	Description
- UniqueExtendedCopy <i>ctl_no port_no group_no</i> enable disable	Specify whether to set the Unique Extended COPY Mode effective or ineffective <i>ctl_no</i> : Controller number (0, 1), <i>port_no</i> :Port number (A, B, C, D, E, F, G, H) <i>group_no</i> : Host Group number enable : Enables the Unique Extended COPY Mode. disable : Disables the Unique Extended COPY Mode.
-UniqueWriteSame <i>ctl_no port_no group_no</i> enable disable	Specify whether to set the Unique Write Same Mode effective or ineffective <i>ctl_no</i> : Controller number (0, 1), <i>port_no</i> :Port number (A, B, C, D, E, F, G, H) <i>group_no</i> : Host Group number enable : Enables the Unique Write Same Mode. disable : Disables the Unique Write Same Mode
Note: -platform and -middleware option and each host group option can also be specified at the same time.	

Example

The following example displays the host group options of an array 9500.

```
% auhgopt -unit 9500 -refer
Port 0A, Group 0
Host connection mode 1 = standard
Host connection mode 2
SPC-2 Mode = OFF
Same Node Name Mode = OFF
Tru Cluster Connection Mode = OFF
Path Switch Mode(Active/Passive Group) = OFF
Path Switch Mode(Active/Passive) = OFF
Path Switch Mode(Active/Active) = OFF
Port-ID No Report Mode = OFF
Port-ID Conversion Mode = OFF
No_RSV_Conf Mode = OFF
ftServer Connection Mode 2 = OFF
SRC Read Command Reject Mode = OFF
UA(06/2A00) suppress Mode = OFF
HISUP Mode = OFF
CCHS Mode = OFF
HP Connection Mode 2 = OFF
Product ID DF400 Mode = OFF
NACA Mode = OFF
SUN Cluster Connection Mode = OFF
Persistent RSV Cluster Mode = OFF
Target Reset (Bus Device Reset) Mode = OFF
Reserve Mode = OFF
Logical Unit Reset Mode = OFF
Third Party Process Logout Mode = OFF

Port 0B, Group 0
```

```

:
Port 1A, Group 0
:
Port 1B, Group 0
:
%
```

The following example displays the host group options of an array ams500.

```

% auhgopt -unit ams500 -refer
Port 0A, Group 0
Host connection mode 1 = standard
Host connection mode 2
HP-UX Mode = OFF
PSUE Read Reject Mode = OFF
UA(06/2A00) suppress Mode = OFF
NACA Mode = OFF
HISUP OFF Mode = ON
Reset Propagation Mode = OFF
Unique Reserve Mode 1 = OFF
ASL Report Mode(Active/Passive Group) = OFF
ASL Report Mode(Active/Passive) = OFF
ASL Report Mode(Active/Active) = OFF
Port-ID No Report Mode = OFF
Port-ID Conversion Mode = OFF
Tru Cluster Mode = OFF
Product Serial Response Mode = OFF
Same Node Name Mode = OFF
CCHS Mode = OFF
SPC-2 Mode = OFF
S-VOL Disable Advanced Mode = OFF

Port 0B, Group 0
:
Port 1A, Group 0
:
Port 1B, Group 0
:
%
```

The following example displays the host group options of an array ams2300.

```

% auhgopt -unit ams2300 -refer
Port 0A, Group 0
Platform = not specified
Middleware = not specified
Host connection mode 1 = Standard Mode
Host connection mode 2
HP-UX Mode = OFF
PSUE Read Reject Mode = OFF
Mode Parameters Chnaged Notification Mode = OFF
NACA Mode = OFF
Task Management Isolation Mode = ON
Unique Reserve Mode 1 = OFF
Port-ID Conversion Mode = OFF
Tru Cluster Mode = OFF
Product Serial Response Mode = OFF
Same Node Name Mode = OFF
CCHS Mode = OFF
Inquiry Serial Number Conversion Mode = OFF
NOP-In Suppress Mode = OFF
S-VOL Disable Advanced Mode = OFF
Discovery CHAP Mode = OFF
Unique Extended COPY Mode = OFF
```

Unique Write Same Mode = OFF
 DP Depletion Detail Reply Mode = OFF
 Unit Attention Change Mode = OFF
 UNMAP Short Length Mode = OFF
 Change Response for Replication Mode = OFF
 WriteSame Rejection Mode = OFF
 FullProvisioning Reply Mode = OFF
 UNMAP Rejection Mode = OFF

Port 0B, Group 0

:

Port 1A, Group 0

:

Port 1B, Group 0

:

Referencing/setting mapping information

Command name

auhgmap

Format

9500V, AMS, WMS, SMS, AMS2000, HUS
 auhgmap -unit unit_name -refer

When specifying host group number.

auhgmap -unit unit_name -add ctl_no port_no group_no hlu lu

auhgmap -unit unit_name -chg ctl_no port_no group_no hlu lu

auhgmap -unit unit_name -rm ctl_no port_no group_no hlu lu

When specifying host group number or name.

auhgmap -unit unit_name -add ctl_no port_no
 -gno group_no | -gname group_name -hlu hlu -lu lu

auhgmap -unit unit_name -chg ctl_no port_no
 -gno group_no | -gname group_name -hlu hlu -lu lu

auhgmap -unit unit_name -rm ctl_no port_no
 -gno group_no | -gname group_name -hlu hlu -lu lu

auhgmap -unit unit_name -MappingMode on | off

AMS, WMS, SMS, AMS2000, HUS

auhgmap -unit unit_name -availablelist ctl_no port_no
 -gno group_no | -gname group_name -hlu | -lu

Description

This command sets mapping information.

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of an array unit in which the mapping information to be referenced or set. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "(minus)", "_ (underline)", "." (period)", "@", or " (space)". Space in front and in the rear of the character string is removed
-refer	References the mapping information
-MappingMode on off	Specifies whether to set the Mapping mode effective or ineffective. on : Enables the Mapping mode off: Disables the Mapping mode
-availablelist <i>ctl_no port_no</i>	A list of LUNs or H-LUNs, each of which is eligible for the mapping is displayed within the specified controller number, a port number, and a host group.
-hlu	Specify when displaying a list of H-LUNs, each of which is eligible for the mapping.
-lu	Specify when displaying a list of LUNs, each of which is eligible for the mapping.

When specifying host group number

Option	Description
-add <i>ctl_no port_no group_no hlu lu</i>	Adds the mapping information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H) <i>group_no</i> : Host Group number <i>hlu</i> : LU number recognized by the host <i>lu</i> : LU number of the array unit
-chg <i>ctl_no port_no group_no hlu lu</i>	Changes the mapping information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H) <i>group_no</i> : Host Group number <i>hlu</i> : LU number recognized by the host <i>lu</i> : LU number of the array unit
-rm <i>ctl_no port_no group_no hlu lu</i>	Deletes the mapping information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H) <i>group_no</i> : Host Group number <i>hlu</i> : LU number recognized by the host <i>lu</i> : LU number of the array unit

When specifying host group number or host group name

Option	Description
-add <i>ctl_no</i> <i>port_no</i>	Adds the mapping information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H)
-chg <i>ctl_no</i> <i>port_no</i>	Changes the mapping information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H)
-rm <i>ctl_no port_no</i>	Deletes the mapping information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H)
-gno <i>group_no</i>	Specify a host group number. <i>group_no</i> : Host group number
-gname <i>group_name</i>	Specify a host group name. <i>group_name</i> : Host group name (Less than or equal to 32 ASCII characters (alphabetic characters, numerals, and the following symbols) can be used (until AMS or WMS, 16 characters). (!, #, \$, %, &, ', +, ,., =, @, ^, _ , {, }, ~, (,), [,], (space))
-hlu <i>hlu</i>	Specify a LUN to be recognized by a host.
-lu <i>lu</i>	Specify an internal LUN of the disk array subsystem.

Example

The following example displays mapping information of an array 9500.

```
% auhgmap -unit 9500 -refer
Mapping Mode = ON
Port  Group  H-LUN  LUN
0A    0      0      0
0A    0      1      1
0A    0      2      2
0A    0      3      3
0B    0      0      0
0B    0      1      1
0B    0      2      2
0B    0      3      3
1A    0      0      0
1A    0      1      1
1A    0      2      2
1A    0      3      3
1B    0      0      0
1B    0      1      1
1B    0      2      2
1B    0      3      3
%
```

Referencing/registration/changing/deleting a host group

Command name

auhgdef

Format

```
9500V, AMS, WMS, SMS, AMS2000, HUS
auhgdef -unit unit_name -refer

auhgdef -unit unit_name -add
        ctl_no port_no [ -gno group_no ] -gname group_name

auhgdef -unit unit_name -chg
        ctl_no port_no
        -gno group_no | -gname group_name
        -newgname group_name

auhgdef -unit unit_name -rm
        ctl_no port_no
        -gno group_no ... | -gname group_name ...

auhgdef -unit unit_name -init
        ctl_no port_no
```

Description

This command performs a reference of a list, new registration, name change, or deletion of the host group(s).

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of the array unit for which to reference, register, change, or delete the host group(s). Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.
-refer	Displays a list of the host groups which have been registered and whose host group security has been allocated to valid ports.
-add <i>ctl_no</i> <i>port_no</i>	Registers the host groups, which are permitted to access the specified port, and their names. It is not allowed to register them in the host groups, which have been registered, in overwriting manner. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H)
-chg <i>ctl_no</i> <i>port_no</i>	Changes the host group name that has been registered in the specified port. Specify the object host group using a host group number or host group name. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H)
-rm <i>ctl_no port_no</i>	Deletes the host group registered in the specified port. Specify the object host group using a host group number or host group name. The two or more host groups can be specified. However, the two methods of specification cannot be used at the same time. Incidentally, the Host Group 0 cannot be deleted. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H)
-init <i>ctl_no port_no</i>	Initializes the Host Group 0 of the specified port. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, C, D, E, F, G, H)

Option	Description
-gno <i>group_no</i> ...	When the -add option is specified: Specify a host group number to be registered. Only a single host group number can be specified. Besides, the specification for the host group number can be omitted. When the specification is omitted, the least one of unregistered host group numbers is assigned. When the -chg option is specified: Specify a number of the host group whose name is to be changed. Only a single host group number can be specified. When the -rm option is specified: Specify a host group number to be deleted. One or more host group number(s) can be specified. Incidentally, the Host Group 0 cannot be deleted. Single specification : Specifying a single host group number. Example: -gno 3 Multiple specification: Specifying multiple host group numbers. Example: -gno 1 2 3 4 5 8 -gno 1-5 8 When specifying the range using a hyphen ("-"), undefined host group number cannot be included within the range to be specified. group_no: host group number (0 to 127)
-gname <i>group_name</i> ...	When the -add option is specified: Specify a host group name to be registered. Only a single host group name can be specified. When the -chg option is specified: Specify a host group name to be changed. Only a single host group name can be specified. When the -rm option is specified: Specify a host group name to be deleted. One or more host group name can be specified. Single specification : Specifying a single host group name. Example: -gname solaris Multiple specification: Specifying multiple host group name. Example: -gname irix01 solaris win001 group_name: host group name (See Note 1)
-newgname <i>group_name</i>	Specify a host group name to be validated after the change when the -chg option is specified. group_name: host group name (See Note 1)
Note 1: Less than or equal to 32 ASCII characters (alphabetic characters, numerals, and the following symbols) can be used (until AMS or WMS, 16 characters). (!, #, \$, %, &, ', +, -, ., =, @, ^, _ , {, }, ~, (,), [,], (space))	

Example

The following example displays host group information of an array ams500.

```
% auhgdef -unit ams500 -refer
Port 0A
Group Host Group Name
0 HG0A-000
Port 0B
Group Host Group Name
0 HG0B-000
Port 1A
Group Host Group Name
0 HG1A-000
Port 1B
Group Host Group Name
0 HG1B-000
%
```

File output of host group information

Command name

auhgout

Format

```
9500V
auhgout -unit unit_name -file file_name
```

Description

This command outputs the contents of the setting for the host group information set in the array in a specified file, in a text format.

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of an array unit in which the mapping information to be referenced or set. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed
-file <i>file_name</i>	Specify the name the file (path) to output the host group information.

Example

The following example outputs the host group information of the array 9500a1 in file: hgprm.txt into the directory where Storage Navigator Modular 2 is installed.

```
% auhgout -unit 9500a1 -file hgprm.txt
Password:
%
```

The format of the output file consists of the following items. The outline of the layout of the output file is shown in the following output.

```
Configuration Information list
DF Name: 9500
Date: 2009/11/19 16:12:59
Firmware Revision: 065B/F
Array Unit Type: 9500V
Serial Number: 65000026
----CommonInformation----
MappingMode = Off
---- CTL0 ----
----PortA ----
----PortOption----
Reset/LIP Mode (Signal) = OFF
Reset/LIP Mode (Process) = OFF
LIP Port All Reset Mode = OFF
Read Frame Min 128 Byte Mode = OFF
----HostGroupList----
----HostGroupInformation----
HostGroupNumber = 0
HostGroupName = "G000

----HostSystemConfiguration----
Platform = not specified
Alternate Path = not specified
Failover = not specified
Additional Parameters
None
----HostGroupOption----
Host Connection Mode 1 = Standard Mode
Host Connection Mmode 2
SPC-2 Mode = OFF
Same Node Name Mode = OFF
Tru Cluster Connection Mode = OFF
Path Switch Mode (Active/Passive Group) = OFF
```

Path Switch Mode (Active/Passive) = OFF
Path Switch Mode (Active/Active) = OFF
Port-ID No Report Mode = OFF
Port-ID Conversion Mode = OFF
No_RSV_Conf Mode = OFF
ftServer Connection Mode 2 = OFF
SRC Read Command Reject Mode = OFF
UA(06/2A00) suppress Mode = OFF
HISUP Mode = OFF
CCHS Mode = OFF
HP Connection Mode 2 = OFF
Product ID DF400 Mode = OFF
NACA Mode = OFF
SUN Cluster Connection Mode = OFF
Persistent RSV Cluster Mode = OFF
Target Reset (Bus Device Reset) Mode = OFF
Reserve Mode = OFF
Logical Unit Reset Mode = OFF
Third Party Process Logout Mode = OFF

----LuMapping----

H-LUN LUN

--HostGroupInformationEnd

--HostGroupListEnd

---LUNManagement Information ---

Security = ON

----PermissionList----

--PermissionListEnd

Setting the host group information with a file

Command name

auhgset

Format

```
9500V
auhgset -unit unit_name -file file_name
        [-portop] [-opt] [-map] [-wwn]
```

Description

This command sets the host group information (port option, host group option, mapping information, and host information) described in the file to the array. All information is set up when input classification is omitted.

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of an array unit in which the mapping information to be referenced or set. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed
-file <i>file_name</i>	Specify the name the file (path) to output the host group information.
-portop	Specify when setting up the port option.
-opt	Specify when setting up the host group option.
-map	Specify when setting up the map information.
-wwn	Specify when setting up the host information.hh

Example

The following example sets array 9500a1 according to the host group information described in text file: hgprm.txt.

```
% auhgset -unit 9500a1 -file hgprm.txt
Password:
Are you sure you want to set the port and host group information?
(y/n [n]): y
When setting starts, the subsystem stops accepting access to the subsystem or the host group from the host.
Before setting, stop access to the subsystem or the host group from the host.
Do you want to continue processing? (y/n [n]): y
The port and host group information has been set successfully.
%
```

Target information

This section covers the following commands related to targets:

- [Referencing/setting iSCSI target information on page 3-245](#)
- [Referencing/setting the initiator information on page 3-249](#)
- [Referencing/setting iSCSI target options on page 3-253](#)
- [Referencing/setting iSCSI target mapping information on page 3-269](#)

Referencing/setting iSCSI target information

Command name

autargetdef

Format

AMS, WMS, SMS, AMS2000, HUS100
autargetdef -unit unit_name -refer

autargetdef -unit unit_name -add ctl_no port_no
[-tno target_no] -talias target_alias
-iname target_iscsi_name [-inamefile file_name
-authmethod CHAP | None | CHAP None
[-mutual enable | disable]
[-tuser target_user_name | -tuserfile file_name]

autargetdef -unit unit_name -chg ctl_no port_no
-tno target_no [-talias target_alias
[-newtalias target_alias]
-iname target_iscsi_name [-inamefile file_name]
[-authmethod CHAP | None | CHAP None]
[-mutual enable | disable]
[-tuser target_user_name | -tuserfile file_name]
[-tsecret]

autargetdef -unit unit_name -rm ctl_no port_no
-tno target_no ... [-talias target_alias ...

autargetdef -unit unit_name -init ctl_no port_no

Description

This command references or sets the iSCSI target information.



NOTE: At the Windows 98 MS-DOS prompt, the input buffer is up to 128 characters by default. Use the options, **-inamefile** and **-tuserfile**, when a long iSCSI name or target user name is specified. The first line of the specified file is set for iSCSI name or target user name, and the second line and the following are invalid.

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of the array unit for which to reference or set the target information. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.
-refer	References the target information.

Option	Description
-add <i>ctl_no</i> <i>port_no</i>	Adds the target information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-chg <i>ctl_no</i> <i>port_no</i>	Changes the target information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-rm <i>ctl_no port_no</i>	Deletes the target information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-init <i>ctl_no port_no</i>	Initializes the Target 0. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-tno <i>target_no</i>	When the -add option is specified: Specify the target number. When the specification is omitted, Navigator assigns the minimum number. When the -chg option is specified: Specify the target number. <i>target_no</i> : Target number
-tno <i>target_no ...</i>	Specify the target number. Single or multiple target numbers can be specified. Single specification : Specifying a single target number. Example: -tno 3 Multiple specification: Specifying multiple target numbers. Example: -tno 1 2 3 4 5 8 -tno 1-5 8 <i>target_no</i> : Target number
-talias <i>target_alias</i>	Specify the target alias. Space in front and in the rear of the character string is removed. Cannot specify spaces only. <i>target_alias</i> : Target alias (See Note 1)

Option	Description
-talias <i>target_alias</i> ...	Specify the target alias. Space in front and in the rear of the character string is removed. Cannot specify spaces only. Single or multiple target aliases can be specified. Single specification : Specifying a single target alias. Example: -talias solaris Multiple specification: Specifying multiple target aliases. Example: -talias irix01 solaris win001 <i>target_alias</i> : Target alias (See Note 1)
-iname <i>target_iscsi_name</i>	Specify the target iSCSI name. <i>target_iscsi_name</i> : Target iSCSI name (See Note 2)
-inamefile <i>file_name</i>	Specify the file (path) name when setting the target iSCSI name using a file. <i>file_name</i> : File (path) name
-authmethod CHAP None CHAP None	Specify the authentication method. CHAP: The hosts (as initiators) must with CHAP authentication. None: The hosts (as initiators) must without CHAP authentication None: If the hosts (as initiators) required with CHAP authentication, the authentication is done. (Same as "none CHAP")
-mutual enable disable	Specify whether to set the mutual effective or ineffective. enable : Enables the mutual. disable: Disables the mutual.
-tuser <i>target_user_name</i>	Specify the target user name. Space in front and in the rear of the character string is removed. Cannot specify spaces only. <i>target_user_name</i> : Target user name (See Note 3)
-tuserfile <i>file_name</i>	Specify the file (path) name when setting the target user name using a file. <i>file_name</i> : File (path) name

Option	Description
-tuserfile <i>file_name</i>	Specify the file (path) name when setting the target user name using a file. <i>file_name</i> : File (path) name
-newtalias <i>target_alias</i>	Specify the target alias to be changed. Space in front and in the rear of the character string is removed. Cannot specify spaces only. <i>target_alias</i> : Target alias (See Note 1)
-tsecret	Specify this option when changing Secret of the target. (See Note 4)
	Note 1: For target alias, less than or equal to 32 ASCII characters (alphabetic characters, numerals, and the following symbols) can be used. (!, #, \$, %, &, ', +, -, ., =, @, ^, _ , {, }, ~, (,), [,], (space)) Note 2: Specify the iSCSI name of iqn format or eui format. For iSCSI name, less than or equal to 223 ASCII characters (alphabetic characters, period (.), hyphen (-), and colon (:)) can be used. Note 3: For target user name, less than or equal to 256 ASCII characters (alphabetic characters and the following symbols) can be used. (., -, +, @, _ , =, :, /, [,], ~, (space)) Note 4: For Secret, 12 to 32 ASCII characters (alphabetic characters and the following symbols) can be used. (., -, +, @, _ , =, :, /, [,], ~, (space))

Example

The following example displays the target information of an array sms100.

```
% autargetdef -unit sms100 -refer
Port 0A
Target          Method      CHAP Algorithm  Authentic
ation
000:T000        CHAP,None    MD5             Disable
User Name : ---
iSCSI Name : iqn.1994-04.jp.co.hitachi:rsd.d8a.t.00026.0a000

Port 0B
:

Port 1A
:

Port 1B
:
%
```

The following example displays the target information of an array AMS2300.

```

% autargetdef -unit AMS2300 -refer
Port 0A
Authentication          Mutual
Target Method CHAP Algorithm Authentication
000:T000 CHAP,None MD5 Disable
User Name : ---
iSCSI Name : iqn.1994-04.jp.co.hitachi:rsd.d8a.t.00007.0a000
001:win001 None

User Name : ---
iSCSI Name : iqn.ams2300-1
Port 0B
Authentication          Mutual
Target Method CHAP Algorithm Authentication
:
:
:
%

```

Referencing/setting the initiator information

Command name

autargetini

Format

```

AMS, WMS, SMS, AMS2000, HUS100
autargetini -unit unit_name -refer
[ ctl_no port_no -tno target_no | -talias target_alias ]
[ ctl_no port_no -login ]

autargetini -unit unit_name -set ctl_no port_no
-tgs on | off

When adding initiator:
autargetini -unit unit_name -add-ctl_no port_no
[-tno target_no | -talias target_alias
-iname initiator_iscsi_name [-inamefile file_name
-ininame initiator_nickname
autargetini -unit unit_name -add ctl_no port_no
-tno target_no | -talias target_alias
-iname initiator_iscsi_name [-inamefile file_name ]
-ininame initiator_nickname ]

When added initiator is assigned to author target.
autargetini -unit unit_name -chg ctl_no port_no
-iname initiator_iscsi_name | -inamefile file_name |
-ininame initiator_nickname
[ -newiname new_iscsi_name | -newinamefile file_name |
[ -newininame new_initiator_nickname ]

autargetini -unit unit_name -rm ctl_no port_no
-tno target_no | -talias target_alias
-iname initiator_iscsi_name [-inamefile file_name |
-ininame initiator_nickname

autargetini -unit unit_name -availablelist ctl_no port_no
-tno target_no | -talias target_alias

```

Description

This command references or sets the initiator information.



NOTE: At the Windows 98 MS-DOS Prompt, the input buffer is up to 128 characters by default. Use the option, **-inamefile** or **-newinamefile**, when a long iSCSI name is specified. The first line of the specified file is set for iSCSI name, and the second line and the following are invalid.

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of the array unit for which to reference or set the target information. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.
-refer	References the target information.
-set <i>ctl_no port_no</i>	Set the target security. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-add <i>ctl_no port_no</i>	Adds the initiator information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-chg <i>ctl_no port_no</i>	Changes the initiator information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-rm <i>ctl_no port_no</i>	Deletes the initiator information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-availablelist <i>ctl_no port_no</i>	Displays the eligible initiator information <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-tno <i>target_no</i>	Specify the target number. <i>target_no</i> : Target number
-talias <i>target_alias</i>	Specify the target alias. Space in front and in the rear of the character string is removed. Cannot specify spaces only. <i>target_alias</i> : Target alias (See Note 1)
-iname <i>target_iscsi_name</i>	Specify the target iSCSI name. <i>target_iscsi_name</i> : Target iSCSI name (See Note 2)
-login	Specify this option when displaying initiator information that is logged in on the specified port.

Option	Description
-tgs on off	Specify whether to validate or invalidate the target security. on : Enables the target security. off: Disables the target security.
-iname initiator_iscsi_name	Specify the initiator iSCSI name. <i>iscsi_name</i> : iSCSI name (See Note 2)
-inamefile <i>file_name</i>	Specify the file (path) name when setting the initiator iSCSI name using a file. <i>file_name</i> : File (path) name
-ininame <i>initiator_nickname</i>	Specify the initiator name (Nickname). Space in front and in the rear of the character string is removed. Cannot specify spaces only. <i>initiator_nickname</i> : initiator name (See Note 3)
-newiname <i>new_initiator_iscsi_nickname</i>	Specify the initiator iSCSI name to be changed. <i>new_initiator_iscsi_name</i> : initiator iSCSI name (See Note 2)
-newinamefile <i>file_name</i>	Specify the file (path) name when changing the initiator iSCSI name using a file. <i>file_name</i> : File (path) name
-newininame <i>new_initiator_nickname</i>	Specify the initiator name (Nickname) to be changed. Space in front and in the rear of the character string is removed. Cannot specify spaces only. <i>new_initiator_nickname</i> : initiator name (See Note 3)
Note 1: For target alias, less than or equal to 32 ASCII characters (alphabetic characters, numerals, and the following symbols) can be used. (!, #, \$, %, &, ', +, -, ., =, @, ^, _ , {, }, ~, (,), [,], (space)) Note 2: Specify the iSCSI name of iqn format or eui format. For iSCSI name, less than or equal to 223 ASCII characters (alphabetic characters, period (.), hyphen (-), and colon (:)) can be used. Note 3: For initiator name, less than or equal to 32 ASCII characters (alphabetic characters, numerals, and the following symbols) can be used. (!, #, \$, %, &, ', +, -, ., =, @, ^, _ , {, }, ~, (,), [,], (space))	

Example

The following example displays the initiator information of an array ams500.

```
% autargetini -unit ams500 -refer
Port 0A Target Security ON
Detected Initiator
iSCSI Name
iqn.2005-08.jp.co.hitachi:111.xxx.x.xxxxx.xx.xxx
.
Assigned Initiator
Target      Name      iSCSI Name
000:T000    windows-00001  iqn.2005-08.jp.co.hitachi:444.xxx.x.xxxxx.xx.xxx
.
Assignable Initiator
iSCSI Name
iqn.2005-08.jp.co.hitachi:555.xxx.x.xxxxx.xx.xxx
.
Port 0B Target Security OFF
.
Port 1A Target Security OFF
.
Port 1B Target Security OFF
.
%
```

Referencing/setting iSCSI target options

Command name

autargetopt

Format

AMS, WMS, SMS, AMS2000, HUS100
autargetopt -unit unit_name -refer

AMS, WMS

When specifying per target option.

```
autargetopt -unit unit_name -set
[ -HostConnection ctl_no port_no target_no
    standard [ OpenVMS | TRESPASS | WolfPack ]
[ -HP          ctl_no port_no target_no enable | disable ]
[ -PSUEReadReject ctl_no port_no target_no enable | disable ]
[ -UASuppress   ctl_no port_no target_no enable | disable ]
[ -NACA        ctl_no port_no target_no enable | disable ]
[ -HISUPOff    ctl_no port_no target_no enable | disable ]
[ -ResetPropagation ctl_no port_no target_no enable | disable ]
[ -UniqueReserve1 ctl_no port_no target_no enable | disable ]
[ -ASLReportAPG  ctl_no port_no target_no enable | disable ]
[ -ASLReportAP   ctl_no port_no target_no enable | disable ]
[ -ASLReportAA   ctl_no port_no target_no enable | disable ]
[ -PIDNoRep     ctl_no port_no target_no enable | disable ]
[ -PIDConv      ctl_no port_no target_no enable | disable ]
[ -TruCluster   ctl_no port_no target_no enable | disable ]
[ -SerialResponse ctl_no port_no target_no enable | disable ]
[ -SameNodeName  ctl_no port_no target_no enable | disable ]
[ -CCHS         ctl_no port_no target_no enable | disable ]
[ -SPC2         ctl_no port_no target_no enable | disable ]
[ -SvolDisableAdvance ctl_no port_no target_no enable | disable ]
```

When specifying per target.

```
autargetopt -unit unit_name -set ctl_no port_no
[ -no target_no ] -alias target_alias
[ -HostConnection standard [ OpenVMS | TRESPASS | WolfPack ]
[ -HP          enable | disable ]
[ -PSUEReadReject enable | disable ]
[ -UASuppress   enable | disable ]
[ -NACA        enable | disable ]
[ -HISUPOff    enable | disable ]
[ -ResetPropagation enable | disable ]
```

```
[ -UniqueReserve1  enable | disable ]
[ -ASLReportAPG   enable | disable ]
[ -ASLReportAP    enable | disable ]
[ -ASLReportAA    enable | disable ]
[ -PIDNoRep       enable | disable ]
[ -PIDConv        enable | disable ]
[ -TruCluster     enable | disable ]
[ -SerialResponse enable | disable ]
[ -SameNodeName   enable | disable ]
[ -CCHS           enable | disable ]
[ -SPC2           enable | disable ]
[ -SvolDisableAdvance enable | disable ]
```

SMS

When specifying per target option.

```
autargetopt -unit unit_name -set
[ -HostConnection ctl_no port_no target_no
    standard | OpenVMS | TRESPASS | WolfPack ]
[ -HP              ctl_no port_no target_no enable | disable ]
[ -PSUReadReject  ctl_no port_no target_no enable | disable ]
[ -ModeParamChanged ctl_no port_no target_no enable | disable ]
[ -NACA           ctl_no port_no target_no enable | disable ]
[ -TaskIsolation  ctl_no port_no target_no enable | disable ]
[ -UniqueReserve1 ctl_no port_no target_no enable | disable ]
[ -PIDConv        ctl_no port_no target_no enable | disable ]
[ -TruCluster     ctl_no port_no target_no enable | disable ]
[ -SerialResponse ctl_no port_no target_no enable | disable ]
[ -SameNodeName   ctl_no port_no target_no enable | disable ]
[ -CCHS           ctl_no port_no target_no enable | disable ]
[ -InquirySerial  ctl_no port_no target_no enable | disable ]
[ -NOPInSuppress  ctl_no port_no target_no enable | disable ]
[ -SvolDisableAdvance ctl_no port_no target_no enable | disable ]
[ -DiscoveryCHAP  ctl_no port_no target_no enable | disable ]
[ -ReportFullPortalList ctl_no port_no target_no enable | disable ]
[ -UChange        enable | disable ]
```

When specifying per target.

```
autargetopt -unit unit_name -set ctl_no port_no
    -tno target_no | -alias target_alias
[ -HostConnection standard | OpenVMS | TRESPASS | WolfPack ]
[ -HP              enable | disable ]
[ -PSUReadReject  enable | disable ]
[ -ModeParamChanged enable | disable ]
[ -NACA           enable | disable ]
[ -TaskIsolation  enable | disable ]
[ -UniqueReserve1 enable | disable ]
[ -PIDConv        enable | disable ]
[ -TruCluster     enable | disable ]
[ -SerialResponse enable | disable ]
[ -SameNodeName   enable | disable ]
[ -CCHS           enable | disable ]
[ -InquirySerial  enable | disable ]
[ -NOPInSuppress  enable | disable ]
[ -SvolDisableAdvance enable | disable ]
[ -DiscoveryCHAP  enable | disable ]
[ -ReportFullPortalList enable | disable ]
[ -UChange        enable | disable ]
```

```
autargetopt -unit unit_name -set ctl_no port_no
```

```
    -tno target_no | -alias target_alias
    -platform NotSpecified | HP | Solaris | AIX | Linux |
        Windows | VMware | NetWare
    -middleware NotSpecified | VCS | TruCluster
```

AMS2000, HUS100

When specifying per target option.

```
autargetopt -unit unit_name -set
[ -HostConnection ctl_no port_no target_no
    standard | OpenVMS | TRESPASS | WolfPack ]
[ -HP              ctl_no port_no target_no enable | disable ]
[ -PSUReadReject  ctl_no port_no target_no enable | disable ]
[ -ModeParamChanged ctl_no port_no target_no enable | disable ]
[ -NACA           ctl_no port_no target_no enable | disable ]
[ -TaskIsolation  ctl_no port_no target_no enable | disable ]
[ -UniqueReserve1 ctl_no port_no target_no enable | disable ]
[ -PIDConv        ctl_no port_no target_no enable | disable ]
```

```

[-TruCluster    ctl_no port_no target_no enable | disable ]
[-SerialResponse ctl_no port_no target_no enable | disable ]
[-SameNodeName   ctl_no port_no target_no enable | disable ]
[-CCHS          ctl_no port_no target_no enable | disable ]
[-InquirySerial  ctl_no port_no target_no enable | disable ]
[-NOPInSuppress  ctl_no port_no target_no enable | disable ]
[-SvolDisableAdvance ctl_no port_no target_no enable | disable ]
[-DiscoveryCHAP  ctl_no port_no target_no enable | disable ]
[-UniqueExtendedCOPY ctl_no port_no target_no enable |
disable ]
[-UniqueWriteSame  ctl_no port_no target_no enable | disable ]
[-ReportFullPortalListctl_no port_no target_no enable | disable ]
[-DPDepletionReply  ctl_no port_no target_no enable | disable ]
[-UACHange         ctl_no port_no target_no enable | disable ]
[-UACHange         ctl_no port_no group_no enable | disable ]
[-UNMAPShortLength ctl_no port_no target_no enable | disable ]
[-ChangeRespRepli  ctl_no port_no target_no enable | disable ]
[-WriteSameReject
ctl_no port_no target_no enable | disable ]
[-FullProvisioning
ctl_no port_no target_no enable | disable ]
[-UNMAPReject ctl_no port_no target_no enable | disable ]

```

When specifying per target.

```

autargetopt -unit unit_name -set ctl_no port_no
-tno target_no }-alias target alias
[-HostConnection  ctl_no port_no target_no
standard | OpenVMS | TRESPASS | WolfPack ]
[-HP enable | disable ]
[-PSUReadReject enable | disable ]
[-ModeParamChanged enable | disable ]
[-NACA enable | disable ]
[-TaskIsolation enable | disable ]
[-UniqueReserve1 enable | disable ]
[-PIDConv enable | disable ]
[-TruCluster enable | disable ]
[-SerialResponse enable | disable ]
[-SameNodeName enable | disable ]
[-CCHS enable | disable ]
[-InquirySerial enable | disable ]
[-NOPInSuppress enable | disable ]
[-SvolDisableAdvance enable | disable ]
[-DiscoveryCHAP enable | disable ]
[-UniqueExtendedCOPY enable | disable ]
[-UniqueWriteSame enable | disable ]
[-ReportFullPortalList enable | disable ]
[-DPDepletionReply enable | disable ]
[-UACHange enable | disable ]
[-UNMAPShortLength enable | disable ]
[-ChangeRespRepli enable | disable ]
[-WriteSameReject enable | disable ]
[-FullProvisioning enable | disable ]
[-UNMAPReject enable | disable ]

```

When specifying simple setting option

```

autargetopt -unit unit_name -set ctl_no port_no
-tno target_no }-alias target_alias
-platform NotSpecified | HP | Solaris | AIX | Linux |
Windows | VMware |
-middleware NotSpecified | VCS | TruCluster

```

Description

This command references or sets the iSCSI target options.

Options

The following options table details the -unit switch.

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “. (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	References the target options. When specifying per option (For AMS, WMS, SMS, and AMS2000)

The following option table details options when specifying per option (For AMS, WMS, SMS, and AMS 2000).

Option	Description
-set	Sets the target options.
-HP <i>ctl_no port_no target_no</i> enable disable	Specify whether to set the HP-UX Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>target_no</i> : Target number. enable : Enables the HP-UX Mode. disable : Disables the HP-UX Mode.
-PSUReadReject <i>ctl_no port_no target_no</i> enable disable	Specify whether to set the PSUE Read Reject Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>target_no</i> : Target number. enable : Enables the PSUE Read Reject Mode. disable : Disables the PSUE Read Reject Mode.
-NACA <i>ctl_no port_no target_no</i> enable disable	Specify whether to set the NACA mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>target_no</i> : Target number. enable : Enables the NACA Mode. disable : Disables the NACA Mode.
-UniqueReserve1 <i>ctl_no port_no target_no</i> enable disable	Specify whether to set the Unique Reserve Mode 1 effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>target_no</i> : Target number. enable : Enables the Unique Reserve Mode 1. disable : Disables the Unique Reserve Mode 1.

-PIDConv <i>ctl_no</i> <i>port_no target_no</i> enable disable	Specify whether to set the Port-ID Conversion mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>target_no</i> : Target number. enable : Enables the Port-ID Conversion mode. disable : Disables the Port-ID Conversion mode.
-TruCluster <i>ctl_no</i> <i>port_no target_no</i> enable disable	Specify whether to set the Tru Cluster Connection mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>target_no</i> : Target number. enable : Enables the Tru Cluster Connection mode. disable : Disables the Tru Cluster Connection mode.
-SerialResponse <i>ctl_no port_no</i> <i>target_no</i> enable disable	Specify whether to set the Product Serial Response Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>target_no</i> : Target number. enable: Enables the Product Serial Response Mode. disable: Disables the Product Serial Response Mode.
-SameNodeName <i>ctl_no port_no</i> <i>target_no</i> enable disable	Specify whether to set the Same Node Name mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>target_no</i> : Target number. enable : Enables the Same Node Name mode. disable : Disables the Same Node Name mode.
-CCHS <i>ctl_no</i> <i>port_no target_no</i> enable disable	Specify whether to set the CCHS convert mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>target_no</i> : Target number. enable : Enables the CCHS convert mode. disable : Disables the CCHS convert mode.
- SvolDisableAdvanc e <i>ctl_no port_no</i> <i>target_no</i> enable disable	Specify whether to set the S-VOL Disable Advanced Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>target_no</i> : Target number. enable : Enables the S-VOL Disable Advanced Mode. disable : Disables the S-VOL Disable Advanced Mode.

The following option table details options when specifying per option (For AMS and WMS).

Option	Description
-UASuppress <i>ctl_no port_no target_no</i> enable disable	Specify whether or not to suppress a unit attention (06/2A00). <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B). <i>target_no</i> : Target number. enable : Suppress the unit attention. disable : Does not suppress the unit attention.
-HISUPOff <i>ctl_no port_no target_no</i> enable disable	Specify whether to set the HISUP OFF Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B). <i>target_no</i> : Target number. enable : Enables the HISUP OFF Mode. disable : Disables the HISUP OFF Mode.
-ResetPropagation <i>ctl_no port_no target_no</i> enable disable	Specify whether to set the Reset Propagation Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B). <i>target_no</i> : Target number. enable : Enables the Reset Propagation Mode. disable : Disables the Reset Propagation Mode.
-ASLReportAPG <i>ctl_no port_no target_no</i> enable disable	Specify whether to set the ASL Report Mode (Active/Passive Group) effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B). <i>target_no</i> : Target number. enable : Enables the ASL Report Mode (Active/Passive Group). disable : Disables the ASL Report Mode (Active/Passive Group).
-ASLReportAA <i>ctl_no port_no target_no</i> enable disable	Specify whether to set the ASL Report Mode (Active/Passive) effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B). <i>target_no</i> : Target number. enable : Enables the ASL Report Mode (Active/Passive). disable : Disables the ASL Report Mode (Active/Passive).

-ASLReportAA <i>ctl_no port_no target_no</i> enable disable	Specify whether to set the ASL Report Mode (Active/Active) effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B). <i>target_no</i> : Target number. enable : Enables the ASL Report Mode (Active/Active). disable : Disables the ASL Report Mode (Active/Active).
-PIDNoRep <i>ctl_no port_no target_no</i> enable disable	Specify whether to set the Port-ID No Report mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B). <i>target_no</i> : Target number. enable : Enables the Port-ID No Report mode. disable : Disables the Port-ID No Report mode.
-SPC2 <i>ctl_no port_no target_no</i> enable disable	Specify whether to set the Tru Cluster Connection mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B). <i>target_no</i> : Target number. enable : Enables the SPC-2 Mode. disable : Disables the SPC-2 Mode.

The following option table details options when specifying per option (For SMS and AMS 2000).

Option	Description
-ModeParamChanged <i>ctl_no port_no target_no</i> enable disable	Specify whether to set the Mode Parameters Changed Notification Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>target_no</i> : Target number. enable : Enables the Mode Parameters Changed Notification Mode. disable : Disables the Mode Parameters Changed Notification Mode.
-TaskIsolation <i>ctl_no port_no target_no</i> enable disable	Specify whether to set the Task Management Isolation Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>target_no</i> : Target number. enable : Enables the Task Management Isolation Mode. disable : Disables the Task Management Isolation Mode.

-InquirySerial <i>ctl_no port_no target_no</i> enable disable	Specify whether to set the Inquiry Serial Number Conversion Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>target_no</i> : Target number. enable : Enables the Inquiry Serial Number Conversion Mode. disable : Disables the Inquiry Serial Number Conversion Mode.
-NOPInSuppress <i>ctl_no port_no target_no</i> enable disable	Specify whether to set the NOP-In Suppress Mode effective or ineffective <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>target_no</i> : Target number. enable : Enables the NOP-In Suppress Mode. disable : Disables the NOP-In Suppress Mode.
-DiscoveryCHAP <i>tl_no_port_no target no</i> enable disable	Specify whether to set the Discovery CHAP Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>target_no</i> : Target number. enable : Enables the Discovery CHAP Mode. disable : Disables the Discovery CHAP Mode.
-platform NotSpecified HP Solaris AIX Linux Windows VMware NetWare	Specify the Platform NotSpecified: not specified HP : HP-UX Solaris : Solaris AIX : AIX Linux : Linux Windows : Windows VMware : VMware NetWare : NetWare
-middleware NotSpecified VCS TruCluster	Specify the Middleware. NotSpecified: not specified VCS : VCS TruCluster : Tru Cluster

The following option table details options when specifying per target (For AMS 2000 only).

Option	Description
-UniqueExtendedCOPY <i>ctl_no port_no target no</i> enable disable	Specify whether to set the Unique Extended COPY Mode effective or ineffective.

-UniqueWriteSame <i>ctl_no port_no</i> <i>target_no</i> enable disable	Specify whether to set the Unique Write Same Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>target_no</i> : Target number. enable : Enables the Unique Extended COPY Mode. disable : Disables the Unique Extended COPY Mode.
-set <i>ctl_no port_no</i>	Sets the target options. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F).
-tno <i>target_no</i>	Specify the target number. <i>target_no</i> : Target number
-talias <i>target_alias</i>	Specify the target alias. Space in front and in the rear of the character string is removed. Cannot specify spaces only.
-HostConnection standard OpenVMS TRESPASS WolfPack	Specify the mode to be emulated. standard: Open system emulation mode OpenVMS : Open VMS mode TRESPASS: TRESPASS mode WolfPack: WolfPack mode
-HP enable disable	Specify whether to set the HP-UX Mode effective or ineffective. enable : Enables the HP-UX Mode. disable : Disables the HP-UX Mode.
-PSUEReadReject enable disable	Specify whether to set the PSUE Read Reject Mode effective or ineffective. enable : Enables the PSUE Read Reject Mode. disable : Disables the PSUE Read Reject Mode.
-NACA enable disable	Specify whether to set the NACA mode effective or ineffective. enable : Enables the NACA mode. disable : Disables the NACA mode.
-ResetPropagation enable disable	Specify whether to set the Reset Propagation Mode effective or ineffective. enable : Enables the Reset Propagation Mode. disable : Disables the Reset Propagation Mode.
-UniqueReserve1 enable disable	Specify whether to set the Unique Reserve Mode 1 effective or ineffective. enable : Enables the Unique Reserve Mode 1. disable : Disables the Unique Reserve Mode 1.

-PIDConv enable disable	Specify whether to set the Port-ID Conversion mode effective or ineffective. enable : Enables the Port-ID Conversion mode. disable : Disables the Port-ID Conversion mode.
-TruCluster enable disable	Specify whether to set the Tru Cluster Connection mode effective or ineffective. enable : Enables the Tru Cluster Connection mode. disable : Disables the Tru Cluster Connection mode.
-SerialResponse enable disable	Specify whether to set the Product Serial Response Mode effective or ineffective. enable : Enables the Product Serial Response Mode. disable : Disables the Product Serial Response Mode.
-SameNodeName enable disable	Specify whether to set the Same Node Name mode effective or ineffective. enable : Enables the Same Node Name mode. disable : Disables the Same Node Name mode.
-CCHS enable disable	Specify whether to set the Same Node Name mode effective or ineffective. enable : Enables the Same Node Name mode. disable : Disables the Same Node Name mode.
-SvolDisableAdvance enable disable	Specify whether to set the S-VOL Disable Advanced Mode effective or ineffective. enable : Enables the S-VOL Disable Advanced Mode. disable : Disables the S-VOL Disable Advanced Mode.

The following option table details options when specifying per target (For AMS and WMS).

Option	Description
-UASuppress enable disable	Specify whether or not to suppress a unit attention (06/2A00). enable : Suppress the unit attention. disable : Does not suppress the unit attention.

-HISUPOff enable disable	Specify whether to set the HISUP OFF Mode effective or ineffective. enable : Enables the HISUP OFF Mode. disable : Disables the HISUP OFF Mode.
-ASLReportAPG enable disable	Specify whether to set the ASL Report Mode (Active/Passive Group) effective or ineffective. enable : Enables the ASL Report Mode (Active/Passive Group). disable : Disables the ASL Report Mode (Active/Passive Group).
-ASLReportAP enable disable	Specify whether to set the ASL Report Mode (Active/Passive) effective or ineffective. enable : Enables the ASL Report Mode (Active/Passive). disable : Disables the ASL Report Mode (Active/Passive).
-ASLReportAA enable disable	Specify whether to set the ASL Report Mode (Active/Active) effective or ineffective. enable : Enables the ASL Report Mode (Active/Active). disable : Disables the ASL Report Mode (Active/Active).
-PIDNoRep enable disable	Specify whether to set the Port-ID No Report mode effective or ineffective. enable : Enables the Port-ID No Report mode. disable : Disables the Port-ID No Report mode.
-SPC2 enable disable	Specify whether to set the SPC-2 Mode effective or ineffective. enable : Enables the SPC-2 Mode. disable : Disables the SPC-2 Mode.

The following option table details options when specifying per target (For SMS and AMS 2000).

Option	Description
--------	-------------

- ModeParamChanged enable disable	Specify whether to set the Mode Parameters Changed Notification Mode effective or ineffective. enable : Enables the Mode Parameters Changed Notification Mode. disable : Disables the Mode Parameters Changed Notification Mode.
-TaskIsolation enable disable	Specify whether to set the Task Management Isolation Mode effective or ineffective. enable : Enables the Task Management Isolation Mode. disable : Disables the Task Management Isolation Mode.
-InquirySerial enable disable	Specify whether to set the Inquiry Serial Number Conversion Mode effective or ineffective. enable : Enables the Inquiry Serial Number Conversion Mode. disable : Disables the Inquiry Serial Number Conversion Mode.
-NOPInSuppress enable disable	Specify whether to set the NOP-In Suppress Mode effective or ineffective. enable : Enables the NOP-In Suppress Mode. disable : Disables the NOP-In Suppress Mode.
-Discovery/CHAP enable disable	Specify whether to set the Discovery CHAP Mode effective or ineffective. enable : Enables the Discovery CHAP Mode. disable : Disables the Discovery CHAP Mode.
- ReportFullPortalList <i>ctl_no port no target_no</i> enable disable	Specify whether to set the Report (iSCSI Full Portal List Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>target_no</i> : Target number. enable : Enables the Report iSCSI Full Portal List Mode. disable : Disables the Report iSCSI Full Portal List Mode.

-UChange ctl_no port_no group_no enable disable	Specify whether to set the Unit Attention Change Mode effective or ineffective. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F). <i>group_no</i> : Host group number. enable : Enables the Unit Attention Change Mode. disable : Disables the Unit Attention Change Mode.
---	--

The following option table details options when specifying per target (AMS 2000 only)

Option	Description
-UniqueExtendedCOPY enable disable	Specify whether to set the Unique Extended COPY Mode effective or ineffective. enable : Enables the Unique Extended COPY Mode. disable : Disables the Unique Extended COPY Mode.
-UniqueWriteSame enable disable	Specify whether to set the Unique Write Same Mode effective or ineffective. enable : Enables the Unique Write Same Mode. disable : Disables the Unique Write Same Mode.
-set <i>ctl_no port_no</i>	Sets the target options. <i>ctl_no</i> : Controller number (0, 1). <i>port_no</i> : Port number (A, B, E, F).
-tno <i>target_no</i>	Specify the target number. <i>target_no</i> : Target number
-talias <i>target_alias</i>	Specify the target alias. Space in front and in the rear of the character string is removed. Cannot specify spaces only. <i>target_alias</i> : Target alias (See Note 1)
-HostConnection standard OpenVMS TRESPASS WolfPack	Specify the mode to be emulated. standard: Open system emulation mode OpenVMS : Open VMS mode TRESPASS: TRESPASS mode WolfPack: WolfPack mode

-HP enable disable	Specify whether to set the HP-UX Mode effective or ineffective. enable : Enables the HP-UX Mode. disable : Disables the HP-UX Mode.
-PSUReadReject enable disable	Specify whether to set the PSUE Read Reject Mode effective or ineffective. enable : Enables the PSUE Read Reject Mode. disable : Disables the PSUE Read Reject Mode.
-NACA enable disable	Specify whether to set the NACA mode effective or ineffective. enable : Enables the NACA mode. disable : Disables the NACA mode.
-UniqueReserve1 enable disable	Specify whether to set the Unique Reserve Mode 1 effective or ineffective. enable : Enables the Unique Reserve Mode 1. disable : Disables the Unique Reserve Mode 1.
-PIDConv enable disable	Specify whether to set the Port-ID Conversion mode effective or ineffective. enable : Enables the Port-ID Conversion mode. disable : Disables the Port-ID Conversion mode.
-TruCluster enable disable	Specify whether to set the Tru Cluster Connection mode effective or ineffective. enable : Enables the Tru Cluster Connection mode. disable : Disables the Tru Cluster Connection mode.
-SerialResponse enable disable	Specify whether to set the Product Serial Response Mode effective or ineffective. enable : Enables the Product Serial Response Mode. disable : Disables the Product Serial Response Mode.
-SameNodeName enable disable	Specify whether to set the Same Node Name mode effective or ineffective. enable : Enables the Same Node Name mode. disable : Disables the Same Node Name mode.
-CCHS enable disable	Specify whether to set the CCHS convert mode effective or ineffective. enable : Enables the CCHS convert mode. disable : Disables the CCHS convert mode.

- SvolDisableAdvanced enable disable	Specify whether to set the S-VOL Disable Advanced Mode effective or ineffective. enable : Enables the S-VOL Disable Advanced Mode. disable : Disables the S-VOL Disable Advanced Mode.
--	--

The following option table details options when specifying per target (For AMS and WMS).

Option	Description
-HISUPOff enable disable	Specify whether to set the HISUP OFF Mode effective or ineffective. enable : Enables the HISUP OFF Mode. disable : Disables the HISUP OFF Mode.
-ResetPropagation enable disable	Specify whether to set the Reset Propagation Mode effective or ineffective. enable : Enables the Reset Propagation Mode. disable : Disables the Reset Propagation Mode.
-ASLReportAPG enable disable	Specify whether to set the ASL Report Mode (Active/Passive Group) effective or ineffective. enable : Enables the ASL Report Mode (Active/Passive Group). disable : Disables the ASL Report Mode (Active/Passive Group).
-ASLReportAP enable disable	Specify whether to set the ASL Report Mode (Active/Passive) effective or ineffective. enable : Enables the ASL Report Mode (Active/Passive). disable : Disables the ASL Report Mode (Active/Passive).
-ASLReportAA enable disable	Specify whether to set the ASL Report Mode (Active/Active) effective or ineffective. enable : Enables the ASL Report Mode (Active/Active). disable : Disables the ASL Report Mode (Active/Active).
-PIDNoRep enable disable	Specify whether to set the Port-ID No Report mode effective or ineffective.

Note 1: For target alias, less than or equal to 32 ASCII characters (alphabetic characters, numerals, and the following symbols) can be used.

(!,#,\$,%,&,'+,-,.,=,@,^,_,{,},~,.(,).[,](space))

Note 2: -platform and -middleware option and each target group option can also be specified at the same time.

Example

The following example displays the target options of an array ams500.

```
% autargetopt -unit ams500 -refer
Port 0A Target 000:T000
Host Connection Mode 1 = Standard Mode
Host Connection Mode 2
HP-UX Mode = OFF
PSUE Read Reject Mode = OFF
UA(06/2A00) suppress Mode = OFF
NACA Mode = OFF
HISUP OFF Mode = ON
Reset Propagation Mode = OFF
Unique Reserve Mode 1 = OFF
ASL Report Mode(Active/Passive Group) = OFF
ASL Report Mode(Active/Passive) = OFF
ASL Report Mode(Active/Active) = OFF
Port-ID No Report Mode = OFF
Port-ID Conversion Mode = OFF
Tru Cluster Mode = OFF
Product Serial Response Mode = OFF
Same Node Name Mode = OFF
CCHS Mode = OFF
SPC-2 Mode = OFF
S-VOL Disable Advanced Mode = OFF

Port 0B Target 000:T000
:
:
Port 1A Target 000:T000
:
:
Port 1B Target 000:T000
:
:
%
```

Referencing/setting iSCSI target mapping information

Command name

autargetmap

Format

```
AMS, WMS, SMS, AMS2000, HUS100
autargetmap -unit unit_name -refer

When specifying target number.
autargetmap -unit unit_name -add ctl_no port_no target_no hlu lu
autargetmap -unit unit_name -chg ctl_no port_no target_no hlu lu
autargetmap -unit unit_name -rm ctl_no port_no target_no hlu lu

When specifying target number or target alias.
autargetmap -unit unit_name -add ctl_no port_no
-tno target_no | -talias target_alias -hlu hlu -lu lu

autargetmap -unit unit_name -chg ctl_no port_no
-tno target_no | -talias target_alias -hlu hlu -lu lu

autargetmap -unit unit_name -rm ctl_no port_no
-tno target_no | -talias target_alias -hlu hlu -lu lu

autargetmap -unit unit_name -MappingMode on | off

autargetmap -unit unit_name -availablelist ctl_no port_no
-tno target_no | -talias target_alias -hlu | -lu
```

Description

This command references or sets the iSCSI target mapping information.



NOTE: At the Windows 98 MS-DOS prompt, the input buffer is up to 128 characters by default. Use the options, **-inamefile** and **-tuserfile**, when a long iSCSI name or target user name is specified. The first line of the specified file is set for iSCSI name or target user name, and the second line and the following are invalid.

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of the array unit for which to reference or set the NAS user LU. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", "." (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.
-refer	Displays the NAS user LU.

Option	Description
-MappingMode on off	Specifies whether to set the Mapping mode effective or ineffective. on : Enables the Mapping mode off: Disables the Mapping mode
-MappingMode on off	A list of LUNs or H-LUNs, each of which is eligible for the mapping is displayed within the specified controller number, a port number, and a target. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-hlu	Specify when displaying a list of H-LUNs, each of which is eligible for the mapping.
-lu	Specify when displaying a list of LUNs, each of which is eligible for the mapping.
When specifying target number	
-add <i>ctl_no</i> <i>port_no</i> <i>target_no</i> <i>hlu</i> <i>lu</i>	Adds the mapping information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F) <i>target_no</i> : Target number <i>hlu</i> : LU number recognized by the host <i>lu</i> : LU number of the array unit
-chg <i>ctl_no</i> <i>port_no</i> <i>target_no</i> <i>hlu</i> <i>lu</i>	Changes the mapping information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F) <i>target_no</i> : Target number <i>hlu</i> : LU number recognized by the host <i>lu</i> : LU number of the array unit
-rm <i>ctl_no</i> <i>port_no</i> <i>target_no</i> <i>hlu</i> <i>lu</i>	Deletes the mapping information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F) <i>target_no</i> : Target number <i>hlu</i> : LU number recognized by the host <i>lu</i> : LU number of the array unit
When specifying target number or target alias	
-add <i>ctl_no</i> <i>port_no</i>	<i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-chg <i>ctl_no</i> <i>port_no</i>	Changes the mapping information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)

Option	Description
-rm <i>ctl_no port_no</i>	Deletes the mapping information. <i>ctl_no</i> : Controller number (0, 1) <i>port_no</i> : Port number (A, B, E, F)
-tno <i>target_no</i>	Specify the target number. <i>target_no</i> : Target number
-talias <i>target_alias</i>	Specify the target alias. Space in front and in the rear of the character string is removed. Cannot specify spaces only. <i>target_alias</i> : Target alias (See Note 1)
-hlu <i>hlu</i>	Specify a LUN to be recognized by a host.
-lu <i>lu</i>	Specify an internal LUN of the disk array subsystem.
Note 1: For target alias, less than or equal to 32 ASCII characters (alphabetic characters, numerals, and the following symbols) can be used. (!, #, \$, %, &, ', +, -, ., =, @, ^, _ , {, }, ~, (,), [,], (space)) Note 2: -platform and -middleware options and each target option can also be specified at the same time.	

Example

The following example displays mapping information of an array ams500.

```
% autargetmap -unit ams500 -refer
Mapping Mode = ON
Port Target      H-LUN LUN
0A 000:T000      0  0
0A 000:T000      1 100
.
0B 000:T000      0  0
0B 000:T000      1 100
.
%
```

NNC parameters

This section covers the following commands related to NNC and MAS parameters:

- [Referencing/setting NNC LAN information on page 3-274](#)
- [Displaying/setting NAS system volume on page 3-275](#)
- [Referencing/setting NAS user volume on page 3-279](#)
- [Referencing/shutdown/booting/rebooting NNC on page 3-281](#)

[Figure 3-10](#) shows an example of a connection of the host computer, in which Storage Navigator Modular 2 is installed, and AMS/WMS array to which the NNC option has been added.

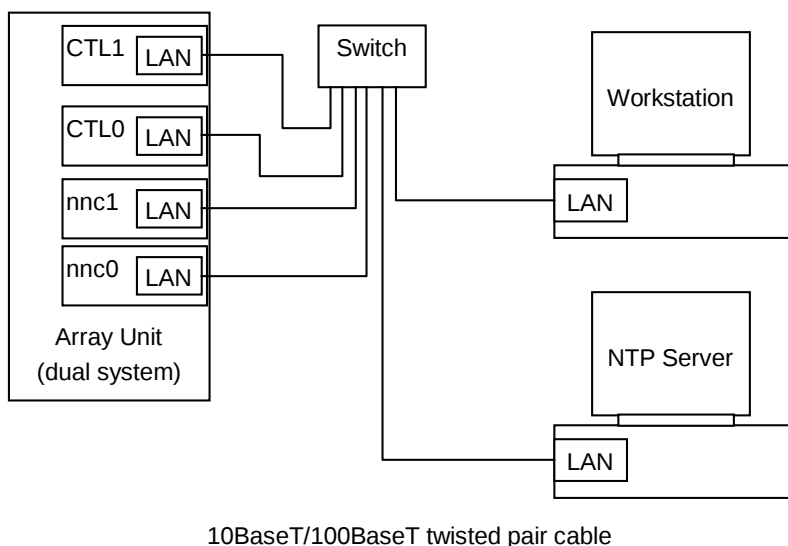


Figure 3-10: Example of host computer connection

Referencing/setting NNC LAN information

Command name

aunnclan

Format

```
AMS, WMS
aunnclan -unit unit_name --refer

aunnclan -unit unit_name -set -nnc nnc_no
[ -addr inet_addr ]
[ -mask netmask ]
[ -mtu num ]
[ -nego auto | 100mh | 100mf | 1000m ]
```

Description

This command references or sets the NNC LAN information.



NOTE: A cluster becomes a stop state when you change an IP address or subnet mask.

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of the array unit for which to reference or set the NNC LAN information. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.
-refer	Displays the NNC LAN information.
-set	Sets the NNC LAN information.
-nnc <i>nnc_no</i>	Specify the NNC number.
-mask <i>netmask</i>	Specify the subnet masks.
-mtu <i>num</i>	Specify the MTU.
-nego auto 100mh 100mf 1000m	Specify the negotiations. auto : The disk array unit makes the decision automatically. 100mh: 100 Mbps/Half 100mf: 100 Mbps/Full 1000m: 1000 Mbps/Full

Example

The following example displays the NNC LAN information of an array ams500.

```
% aunncan -unit ams500 -refer
Password:
Current
  NNC IP Address   Subnet Mask   MTU Negotiation   Result
0 125.0.9.98      255.255.255.0 16100 Auto        Normal
2 125.0.9.99      255.255.255.0 16100 Auto        Normal
Setting
  NNC IP Address   Subnet Mask   MTU Negotiation
0 125.0.9.98      255.255.255.0 16100 Auto
2 125.0.9.99      255.255.255.0 16100 Auto
%
```

The following example sets the NNC LAN information of an array ams500.

```
% aunncan -unit ams500 -set -nnc 0 -addr 192.168.100.100 -mtu 16000
Password:
Are you sure you want to set the LAN information of management NNC port?
(y/n [n]): y
This process may affect the providing service of cluster system.
Please note: When the service is provided in management network interface, the s
ervice is deleted.
When setting completes, the clustering is stopped. Please contact the system adm
inistrator.
Do you want to continue the processing? (y/n [n]): y
The LAN information of management NNC port has been set successfully.
%
```

Displaying/setting NAS system volume

Command name

aunassyslu

Format

```
AMS, WMS
aunassyslu -unit unit_name -refer

When connecting NNCType1.
aunassyslu -unit unit_name -set -nnc nnc_no
[-sys0 lun] [-sys1 lun] [-dump0 lun] [-dump1 lun]
[-cmddev lun] [-dumpwk lun] [-syscom lun]
[-backup lun] [-backup2 lun]

aunassyslu -unit unit_name -rm -nnc nnc_no
[-sys0] [-sys1] [-dump0] [-dump1]
[-cmddev] [-dumpwk] [-syscom]
[-backup] [-backup2]

aunassyslu -unit unit_name -availablelist -nnc nnc_no
-sys0 | -sys1 | -dump0 | -dump1 |
-cmddev | -dumpwk | -syscom | -backup | -backup2

When connecting NNCType2.
aunassyslu -unit unit_name -set -nnc nnc_no
[-sys0 lun] [-sys1 lun] [-dump0 lun] [-dump1 lun]
[-cmddev lun] [-cmddev2 lun] [-syscom lun]
[-backup lun] [-backup2 lun]

aunassyslu -unit unit_name -rm -nnc nnc_no
[-sys0] [-sys1] [-dump0] [-dump1]
[-cmddev] [-cmddev2] [-syscom]
[-backup] [-backup2]
```

```
aunassyslu -unit unit_name -availablelist -nnc nnc_no
            -sys0 | -sys1 | -dump0 | -dump1 |
            -cmddev | -cmddev2 | -syscom | -backup | -backup2
```

Description

This command references or sets the NAS system LU.

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of the array unit for which to reference or set the NAS system LU. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.
-refer	Displays the NAS system LU.
-set	Sets the NAS system LU.
-rm	Releases the NAS system LU.
-availablelist	Displays a list of LUNs that can be assigned to the NAS system LU.
-nnc <i>nnc_no</i>	Specify the NNC numbers separating them with a slash (/). Example: -nnc 0/2
-sys0 <i>lun</i>	Specify an LU number to be assigned to the system disk(CTL0).
-sys1 <i>lun</i>	Specify an LU number to be assigned to the system disk(CTL1).
-dump0 <i>lun</i>	Specify an LU number to be assigned to the volume(CTL0) for storing a dump.
-dump1 <i>lun</i>	Specify an LU number to be assigned to the volume(CTL1) for storing a dump.
-cmddev <i>lun</i>	Specify an LU number to be assigned to the command device.
-cmddev2 <i>lun</i>	Specify an LU number to be assigned to the command device (Secondary).
-dumpwk <i>lun</i>	Specify an LU number to be assigned to the work area for storing a result of the dump edition.
-syscom <i>lun</i>	Specify an LU number to be assigned to the common volume of the NAS system.
-backup <i>lun</i>	Specify an LU number to be assigned to a volume for backing up the common volume.

Option	Description
-backup2 <i>lun</i>	When the -rm option is specified: Releases a volume for backing up 2 the common volume. When the -availablelist option is specified: Displays a list of LUNs that can be assigned to a volume for backing up 2 the common volume.
-sys0	When the -rm option is specified: Releases the system disk (CTL0). When the -availablelist option is specified: Displays a list of LUNs that can be assigned to the system disk (CTL0).
-sys1	When the -rm option is specified: Releases the system disk (CTL1). When the -availablelist option is specified: Displays a list of LUNs that can be assigned to the system disk (CTL1).
-dump0	When the -rm option is specified: Releases the volume (CTL0) for storing a dump. When the -availablelist option is specified: Displays a list of LUNs that can be assigned to the volume (CTL0) for storing a dump.
-dump1	When the -rm option is specified: Releases the volume (CTL1) for storing a dump. When the -availablelist option is specified: Displays a list of LUNs that can be assigned to the volume (CTL1) for storing a dump.
-cmddev	When the -rm option is specified: Releases the command device. When the -availablelist option is specified: Displays a list of LUNs that can be assigned to the command device.
-cmddev2	When the -rm option is specified: Releases the command device (Secondary). When the -availablelist option is specified: Displays a list of LUNs that can be assigned to the command device (Secondary).
-dumpwk	When the -rm option is specified: Releases the work area for storing a result of the dump edition. When the -availablelist option is specified: Displays a list of LUNs that can be assigned to the work area for storing a result of the dump edition. volume.

Option	Description
-syscom	When the -rm option is specified: Releases the common volume of the NAS system. When the -availablelist option is specified: Displays a list of LUNs that can be assigned to the common volume of the NAS system.
-backup	When the -rm option is specified: Releases a volume for backing up the common volume. When the -availablelist option is specified: Displays a list of LUNs that can be assigned to a volume for backing up the common volume.
-backup2	When the -rm option is specified: Releases a volume for backing up 2 the common volume. When the -availablelist option is specified: Displays a list of LUNs that can be assigned to a volume for backing up 2 the common volume.

Examples

The following example displays the NAS system LU of an array ams500.

```
% aunassyslu -unit ams500 -refer
NNC0/2
System Disk(CTL0)          : 0
System Disk(CTL1)          : 100
Volume for Dump(CTL0)      : 1
Volume for Dump(CTL1)      : 101
Command Device             : 5
Working Area for Dump      : 6
System Common Volume       : 8
Backup Volume for Common   : 9
Backup Volume for Common 2 : 10
%
```

The following example sets the NAS system LU of an array ams500.

```
% aunassyslu -unit ams500 -set -nnc 0/2 -sys0 0 -dump0 1 -sys1 100 -dump1 101 -cmddev 5
-dumpwk 6 -syscom 8 -backup 9 -backup2 10
Password:
Are you sure you want to set the system LU? (y/n [n]): y
The system LU has been set successfully.
%
```

The following example displays the NAS system LU of an array ams500.

```
% aunassyslu -unit ams500 -availablelist -nnc 0/2 -sys0
Password:
Available Logical Units
LUN Capacity  RAID Group RAID Level D-CTL C-CTL Type Status
  0 11.0 Gbyte    0 5(4D+1P)    0 0 FC Normal
 22 20.0 Gbyte    0 5(4D+1P)    0 0 FC Normal
  :
  :
  :
%
```

Referencing/setting NAS user volume

Command name

aunasuserlu

Format

AMS, WMS
aunasuserlu -unit unit_name --refer
aunasuserlu -unit unit_name -add -nnc nnc_no hlu lu
aunasuserlu -unit unit_name -chg -nnc nnc_no hlu lu
aunasuserlu -unit unit_name -rm -nnc nnc_no hlu lu
aunasuserlu -unit unit_name -availablelist -nnc nnc_no -hlu | -lu

Description

This command references or sets the NAS user LU.

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of the array unit for which to reference or set the NAS user LU. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.
-refer	Displays the NAS user LU.
-add	Sets the NAS user LU.
-chg	Changes the NAS user LU.
-rm	Deletes the NAS user LU.
-availablelist	Displays a list of H-LUNs or LUNs that can be assigned to the NAS user LU.
-nnc <i>nnc_no</i> <i>hlu</i> <i>lu</i>	When the -add option is specified: Specify the H-LUN and LU to be set. When the -chg option is specified: Specify the H-LUN and LU to be changed. When the -rm option is specified: Specify the H-LUN and LU to be deleted. <i>nnc_no</i> : Specify the NNC numbers separating them with a slash (/). Example: -nnc 0/2 <i>hlu</i> : Specify a LUN to be recognized by a host. <i>lu</i> : Specify an internal LUN of the disk array subsystem.
-nnc <i>nnc_no</i>	Specify the NNC numbers. <i>nnc_no</i> : Specify the NNC numbers separating them with a slash (/). Example: -nnc 0/2
-hlu	Displays a list of H-LUNs that can be assigned to the NAS user LU.
-lu	Displays a list of LUNs that can be assigned to the NAS user LU.

Examples

The following example displays the NAS user LU of an array ams500.

```
% aunasuserlu -unit ams500 -refer
NNC0/2
H-LUN  LUN
  0    20
  0    21
  :
%
```

The following example sets the NAS user LU of an array ams500.

```
% aunasuserlu -unit ams500 -add -nnc 0/2 0 100
Password:
Are you sure you want to add the user LU?
(y/n [n]): y
The user LU has been set successfully.
%
```

The following example changes the NAS user LU of an array ams500.

```
% aunasuserlu -unit ams500 -chg -nnc 0/2 0 100
Password:
Are you sure you want to change the user LU?
(y/n [n]): y
The user LU has been changed successfully.
%
```

The following example deletes the NAS user LU of an array ams500.

```
% aunasuserlu -unit ams500 -rm -nnc 0/2 0 100
Password:
Are you sure you want to release the user LU?
(y/n [n]): y
The user LU has been released successfully.
%
```

The following example displays the NAS host LU of an array ams500.

```
% aunasuserlu -unit ams500 -availablelist -nnc 0/2 -hlu
Password:
Available H-LUN
      2   3   4   5   6   7 8   9  10  11  12  13  14  15
      :
248 249 250 251 252 253 254 255
%
```

The following example displays the NAS LU of an array ams500.

```
% aunasuserlu -unit ams500 -availablelist -nnc 0/2 -lu
Password:
Available Logical Units
LUN Capacity  RAID Group RAID Level  D-CTL C-CTL Type Status
 22  20.0 Gbyte    0  5( 4D+1P)   0   0 FC   Normal
      :
%
```

Referencing/shutdown/booting/rebooting NNC

Command name

aunnnc

Format

```
AMS, WMS
aunnnc -unit unit_name --refer

aunnnc -unit unit_name -shutdown -nnc nnc_no

aunnnc -unit unit_name -boot -nnc nnc_no

aunnnc -unit unit_name -reboot -nnc nnc_no
```

Description

This command references the status of the NNC or Shutdown/ Booting/Rebooting the NNC.

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of the array unit for which to reference the status of the NNC or shutdown/booting/rebooting the NNC. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-" (minus), "_" (underline), "." (period), "@", or " " (space). Space in front and in the rear of the character string is removed.
-refer	References the status of the NNC.
-shutdown	Shut downs the NNC.
-boot	Boots the NNC.
-reboot	Reboots the NNC.
-nnc <i>nnc_no</i>	Specify the NNC number.

Examples

The following example displays the status of the NNC of an array ams500.

```
% aunnc -unit ams500 -refer
NNC Status
0 ACTIVE
2 WARN
%
```

Table 3-17: Status of NNC

Status	Description
ACTIVE	NAS OS is active and the Node is in operation.
BOOT	NAS OS is in boot process.
DISUSE	Controller is blocked.
DOWN	NAS OS has abnormally stopped.
DUMP	A NAS Dump is being collected.
HUNGUP	NAS OS is hung-up.
INACTIVE	NAS OS is in operation and the Node is stopped.
INST	NAS OS is in installation process.
NEW	NAS OS is not installed.
SHUTDOWN	NAS OS is in shutdown process.
STOP	NAS OS is normally stopped.
WARN	NAS Manager is not installed, or NAS OS is in operation and the status of the Node is unknown.



NOTE: When you shutdown or reboot the NNC, just after the array powers ON or cluster starts from the NAS Manager, you must shutdown or reboot the NNC after the following confirmation

The cluster status is “ACTIVE”, and the resource group status is “Online” or “Offline”.

When shutting down or rebooting the NNC and the NNC is not in the above situation, it is possible that the cluster setting and resource group setting cannot be execute normally.

(Example: When executing the cluster stop from the NAS Manager that is connected to the NNC, which has not shut down or rebooted the NNC, it is possible that the cluster stop is not finished.) In this case, reboot the NNC, which has not shut down or rebooted the NNC from Storage Navigator Modular 2.

The following example shut downs the NNC of an array ams500.

```
% aunnc -unit ams500 -shutdown -nnc 0
Password:
Are you sure want to shut down the NNC0?
(y/n [n]): y
Please confirm the status of the cluster and resource group after the cluster is
starting.
If you execute this operation when the cluster and resource group are not availa
ble, it is possible to not set the cluster and resource group after that.
Do you want to continue processing? (y/n [n]): y
While NAS OS is active, this setting may affect the provided service.
Do you want to continue processing? (y/n [n]): y
After the clustering, this setting may affect the provided service.
Do you want to continue processing? (y/n [n]): y
The shutdown of NNC0 has been required.
%
```

There is no difference between boot and reboot operations.

Do not specify anything for the boot option.

The following example boots the NNC of an array ams500.

```
% aunnc -unit ams500 -boot -nnc 0
Password:
Are you sure want to boot the NNC0?
(y/n [n]): y
The boot of NNC0 has been required.
%
```

The following example reboots the NNC of an array ams500.

```
% aunnc -unit ams500 -reboot -nnc 0
Password:
Are you sure want to reboot the NNC0?
(y/n [n]): y
Please confirm the status of the cluster and resource group after the cluster is
starting.
If you execute this operation when the cluster and resource group are not availa
ble, it is possible to not set the cluster and resource group after that.
Do you want to continue processing? (y/n [n]): y
While NAS OS is active, this setting may affect the provided service.
Do you want to continue processing? (y/n [n]): y
After the clustering, this setting may affect the provided service.
Do you want to continue processing? (y/n [n]): y
The reboot of NNC0 has been required.
%
```

Monitoring errors

This section covers the following commands related to monitoring errors:

- [Setting the starting of the application on page 3-286](#)
- [Monitoring errors on page 3-287](#)
- [Referencing/setting the monitoring error options on page 3-295](#)

Setting the starting of the application

Command name

auextprog

Format

```
9500V, AMS, WMS, SMS, AMS2000, HUS100
auextprog -refer
auextprog -set command
auextprog -test
```

Description

This command sets up an external program that is executed when an error is detected while monitoring errors.

Options

Option	Description
-refer	Displays (references) the external program setup.
-set command	Sets up an external program that is executed when an error is detected while monitoring errors.
-test	Starts an external program specified by the -set option.

Examples

The following example sets up the application "go" to be executed.

```
% auextprog -set go
%
```

The following example displays the application setup to be executed.

```
% auextprog -refer
Application Name : go
%
```

Monitoring errors

Command name

auerroralert

Format

```
9500V, AMS, WMS, SMS, AMS2000, HUS100  
auerroralert [ -time uptime ] [ -prog every | once ] [ -nodisp ]  
[ -item [ alert ] [ dpconsumed ] ]
```

Description

This command monitors an array subject to monitoring (an array registered by specifying the `-watch` option) for errors. While monitoring the errors, the word “Executing” indicating that the monitoring is in execution, and the information on failures that are detected by the error monitor are displayed. The contents of failure information displayed are the same as those of messages output to a log file. The word “Executing” indicating that the monitoring is in execution is displayed repeatedly, and the time for which monitoring is in execution is updated and will be displayed on the same line.

To stop monitoring for errors, forcibly terminate the process (e.g. press the Ctrl + c keys).

In the case of the AMS/WMS, a failure that occurs in a different part is treated as a different failure though the model of the part is the same.

Error monitoring starts the monitoring from the status at the time of the start. When error monitoring is restarted, the status of the previous error monitoring is not retained.

The target OS of the event log output is Windows, and target array unit of the event log output is AMS2000/HUS100.

Options

Option	Description
<code>-time <i>uptime</i></code>	Specify the time interval at which to monitor the errors. Specify the value in the range of 1 to 720 minutes. If omitted, the error is monitored only once.

Option	Description
-prog every once	Executes an external program when an error is detected. every: After error monitoring is started, a specified application executes when an error is detected. If the same error is detected while monitoring errors, the application is no longer started from the second detection onward. once : After error monitoring is started, a specified application executed when an error is detected for the first time. If errors are detected continuously, the application will not start. After the specified application executes the first time, in order to start the application again when an error is detected, terminate the error monitoring and then restart again.
-nodisp	A screen display of the monitoring result is suppressed.
-eventlog	Specify this option when outputting or testing the event log. The target OS of the event log output is Windows, and target array unit of the event log output is AMS2000.
-item [alert] [dpconsumed]	Specify the item to monitor. When the specification is omitted, it monitors the failure information. alert: It monitors the failure information. dpconsumed: It monitors the capacity status of DP pool. The target array unit is AMS2000.
-test	Tests the output event log.

Example

The following example monitors errors at an interval of 10 minutes. During error monitoring, a battery failure was detected in an array 9500a1.

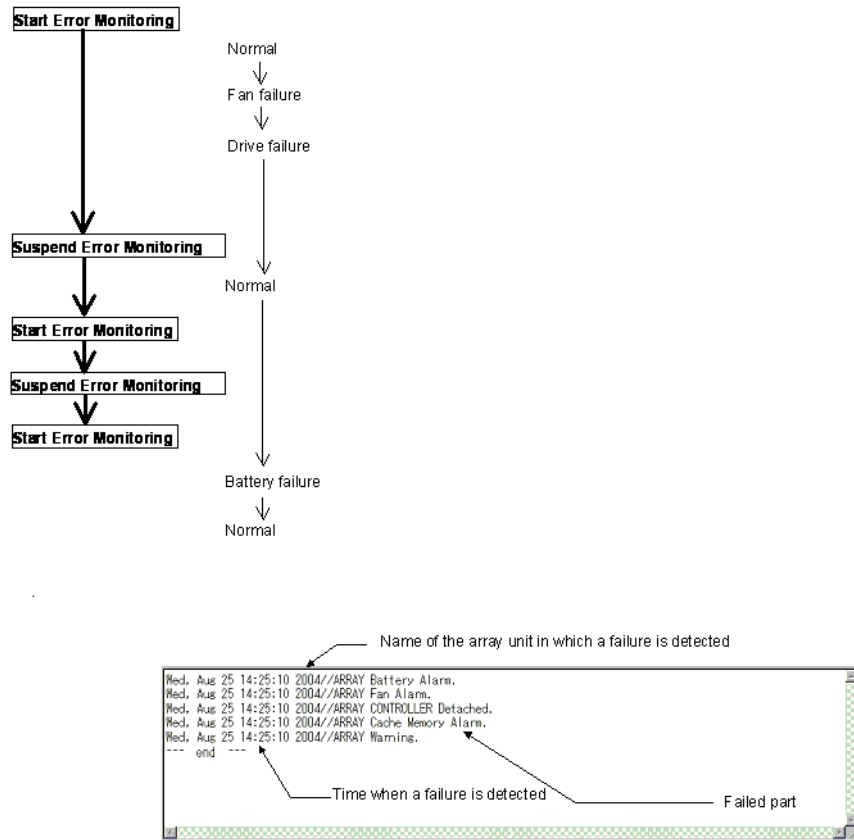
```
% auerroralert -time 1
Mon, May 01 10:10:00 2002 Executing.
Mon, May 01 10:30:00 2002 /9500a1/ARRAY Battery Alarm.
Mon, May 01 10:40:00 2002 Executing.
```

When a failure is detected in the array and error monitoring is executed, the function outputs the failure information to a log file.

When you want to test an event log on Windows, specify the **-test** and **-eventlog** options.

```
% auerroralert -test -eventlog
Thu, Aug 05 15:28:45 2011/(TEST)/ARRAY Hitachi Storage Navigator Modular 2 Event
log test message.
Confirm test log in Event Viewer.
```

The log file is output with file name: errlog.txt and in a text file format, onto a path setup by the STONAVM_HOME environmental variable. The file format is shown in the following example.



The output size of a log file is up to 520 k bytes. When the log information exceeds the limit, the log file is renamed to "errlog.txt.pre" and a log file "errlog.txt" is newly created.

The string "--- end ---" comes at the end of log information output. If the log information surpasses its limit again, the existing log file "errlog.txt" is replaced with "errlog.pre.txt" and then a new log file "errlog.txt" is created again.



NOTE: The failure detection time is a time of the clock on a personal computer or Server/Workstation in which Storage Navigator Modular 2 has been installed.

The log information to be output reports the failure part using a message text. The format of message text is shown below.

Day, Mon.dd hh:mm:ss yyyy/DF name/message text

Day: Day of the week **hh:mm:ss:** Hours, minutes, and seconds

Mon: Month **yyyy:** Year

dd: Date

The following table details message text and meaning for the HUS 100. Note that numbers 18 to 20 are output when Dynamic Provisioning is installed and set to the -early_alert, -depletion_alert, and -notification_alert Enable command options during creating a DP pool.

Table 3-18: Message Text and Meaning for the HUS 100

No.	Message text	Meaning of message	Errlog.txt	Event	
			Output	Output	Type / ID
1	ARRAY Alert Started.	The error monitoring is started.	O	x	–
2	ARRAY Drive Detached.	A drive blockade occurred. (The blocked drive is indicated with a set of a Unit No. and an HDU No.)	O	x	– Error/ 1100
3	ARRAY Detached Drive Position Unit No.X HDU No.Y.		O	x	
4	ARRAY Drive Detached. Position Unit No.X HDU No.Y.		O	x	
5	ARRAY Battery Alarm. Position Battery No.X.	A battery voltage error occurred.	x	O	Error/ 1800
6	ARRAY Fan Alarm. CONTROLLER No.X Fan No.X.	A CTU fan failure occurred.	O	O	
7	ARRAY CONTROLLER Detached. Position CONTROLLER No.X.	A controller blockade occurred. (This occurs only in the dual controller configuration.)	O	O	
8	ARRAY AC Power Supply Failure. Position Unit No.X AC Power No.X.	An AC power supply error occurs.	O	O	
9	ARRAY DC Power Supply Failure Position Unit No. X DC Power No. X.	A DC power supply error occurs	O	O	
10	ARRAY Cache Memory Alarm.	A cache failure occurred.	O	O	
11	ARRAY Cache Backup Circuit Alarm.	A backup circuit failure occurred.	O	O	
12	ARRAY ENC Alarm. Position Unit No.X ENC No.X.	An enclosure error occurs.	O	O	
13	ARRAY Path Alarm.	A path blockade occurred.	O	O	
14	ARRAY Host Connector Alarm. Position CONTROLLER No.X Host Connector No.X.	A host connector error occurs.	O	O	
15	ARRAY Warning.	The array unit entered the warning state.	O	O	
16	ARRAY Interface Board Alarm. Position CONTROLLER No.X Interface Board No.Y.	An interface board blockade occurred.	O	O	
17	ARRAY Hitachi Storage Navigator Modular 2 Interface error occurred.	A failure occurred in the connection with the array unit. A power OFF or a failure occurred in the array unit.	O	O	

17	ARRAY Hitachi Storage Navigator Modular 2 Interface error recovered.	A failure recovered in the connection with the array unit.	O	O	Information 1800
18	ARRAY Pool Consumed Capacity Early Alert Pool No.XX	A DP pool early alert occurred.	O	O	Information 5101
19	ARRAY Pool Consumed Capacity Depletion Alert Pool No.XX	A DP pool depletion alert occurred.	O	O	Information 5102
20	ARRAY Pool Consumed Capacity Over Pool No.XX	A DP pool depletion occurred.	O	O	Warning 5103
21	ARRAY I/F Module Alarm.	An I/F module failure occurred.	x	O	Error/ 1100
22	ARRAY CONTROLLER Detached (Related Parts Alarm). Position CONTROLLER No.X X	A controller blockade occurred by related parts. (This occurs only in the dual controller configuration.)	O	O	Information/ 3100
23	ARRAY Side Card Alarm.	A side card failure occurred.	O	O	Error/ 1100

The following table details message text and meaning for the AMS 2000.

Table 3-19: Message text and meaning (AMS2000)

No.	Message text	Meaning of message	Errlog.txt	Event	
			Output	Output	Type / ID
1	ARRAY Alert Started.	The error monitoring is started.	O	x	–
2	ARRAY Drive Detached. ARRAY Detached Drive Position Unit No.X HDU No.Y.	A drive blockade occurred. (The blocked drive is indicated with a set of a Unit No. and an HDU No.)	O	x	–
3	ARRAY Drive Detached. Position Unit No.X HDU No.Y.		x	O	Error/ 1100
4	ARRAY Battery Alarm. Position Battery No.X.	A battery voltage error occurred.	O	O	
5	ARRAY Additional Battery Alarm. Position Battery No.X.	An additional battery voltage error occurred.	O	O	
6	ARRAY Fan Alarm. Position Unit No.X Fan No.X.	A fan failure occurred.	O	O	
7	ARRAY CONTROLLER Detached. Position CONTROLLER No.X.	A controller blockade occurred. (This occurs only in the dual controller configuration.)	O	O	
8	ARRAY AC Power Supply Failure. Position Unit No.X AC Power No.X.	An AC power supply error occurs.	O	O	
9	ARRAY DC Power Supply Failure. Position Unit No.X DC Power No.X.	A DC power supply error occurs.	O	O	
10	ARRAY Cache Memory Alarm.	A cache failure occurred.	O	O	
11	ARRAY Cache Backup Circuit Alarm.	A backup circuit failure occurred.	O	O	
12	ARRAY ENC Alarm. Position Unit No.X ENC No.X.	An enclosure error occurs.	O	O	
13	ARRAY SENC Alarm. Position Unit No.X SENC No.X.	An SENC error occurred.	O	O	Error/ 1800
14	ARRAY Path Alarm.	A path blockade occurred.	O	O	
15	ARRAY Host Connector Alarm. Position CONTROLLER No.X Host Connector No.X.	A host connector error occurs.	O	O	
16	ARRAY Warning.	The array unit entered the warning state.	O	O	Error/ 1100
17	ARRAY Hitachi Storage Navigator Modular 2 Interface error occurred.	A failure occurred in the connection with the array unit. A power OFF or a failure occurred in the array unit.	O	O	
18	ARRAY Interface Board Alarm. Position CONTROLLER No.X Interface Board No.Y.	An interface board blockade occurred.	O	O	

Table 3-19: Message text and meaning (AMS2000)

19	ARRAY Hitachi Storage Navigator Modular 2 Interface error recovered.	A failure recovered in the connection with the array unit.	O	O	Information/ 1800
20	ARRAY Hitachi Storage Navigator Modular 2 log test message.	For test of event log outputting. Array name is TEST.	x	O	Information/ 9900
21	ARRAY Pool Consumed Capacity Early Alert Pool No. XX	A DP pool early alert occurred.	O	O	Information/ 5101
22	ARRAY Pool Consumed Capacity Depletion Alert Pool No. XX	A DP pool depletion alert occurred.	O	O	Information/ 5102
23	ARRAY Pool Consumed Capacity Over Pool No. XX	A DP pool depletion occurred	O	O	Error/ 5103



NOTE: No. 21 to No. 23 is output when Dynamic Provisioning is installed and set to the early alert, depletion alert, and notification alert Enable command options during creation of a DP pool.

The following table details message texts and meaning for the SMS 100.

Table 3-20: Message text and meaning (SMS100)

No.	Message text	Meaning of message
1	ARRAY Alert Started.	The error monitoring is started.
2	ARRAY Warning.	The array unit entered the warning state.
3	ARRAY Hitachi Storage Navigator Modular 2 Interface error occurred.	A failure occurred in the connection with the array unit. A power OFF or a failure occurred in the array unit.
4	ARRAY replacement is requested (Original Array).	Exchange request of Unit 0 occurred.
5	ARRAY replacement is requested (New Array).	Exchange request of Unit 1 occurred.
6	Repair HDU insertion is requested (1st time).	First time mount request of repair slot drive occurred.
7	Repair HDU insertion is requested (2nd time).	Second time mount request of repair slot drive occurred
8	Repair HDU insertion is requested (3rd time).	Third time mount request of repair slot drive occurred.

The following table details message text and meaning for the AMS/ WMS.

Table 3-21: Message text and meaning (AMS/ WMS)

No.	Message text	Meaning of message
1	ARRAY Alert Started.	The error monitoring is started.
2	ARRAY FC Drive Detached. ARRAY Detached FC Drive Position Unit No.X HDU No.Y.	An FC drive blockade occurred. (The blocked drive is indicated with a set of a Unit No. and an HDU No.)

Table 3-21: Message text and meaning (AMS/WMS)

3	ARRAY SATA Drive Detached. ARRAY Detached SATA Drive Position Unit No. X HDU No. Y	A SATA drive blockade occurred. (The blocked drive is indicated with a set of a Unit No. and an HDU No.)
4	ARRAY Battery Alarm. Position Battery No.X.	A battery voltage error occurred.
5	ARRAY Fan Alarm. Position Unit No.X Fan No.X.	A fan failure occurred.
6	ARRAY CONTROLLER Detached. Position CONTROLLER No.X.	A controller blockade occurred. (This occurs only in the dual controller configuration.)
7	ARRAY AC Power Supply Failure. Position Unit No.X AC Power No.X.	An AC power supply error occurs.
8	ARRAY Cache Memory Alarm.	A cache failure occurred.
9	ARRAY Cache Backup Circuit Alarm.	A backup circuit failure occurred.
10	ARRAY ENC Alarm. Position Unit No.X ENC No.X.	An enclosure error occurs.
11	ARRAY SENC Alarm. Position Unit No.X SENC No.X.	An SENC error occurred.
12	ARRAY Loop Alarm.	A loop error occurs.
13	ARRAY Path Alarm.	A path blockade occurred.
14	ARRAY Host Connector Alarm. Position CONTROLLER No.X Host Connector No.X.	A host connector error occurs.
15	ARRAY Warning.	The array unit entered the warning state.
16	ARRAY Hitachi Storage Navigator Modular 2 Interface error occurred.	A failure occurred in the connection with the array unit. A power OFF or a failure occurred in the array unit.
17	ARRAY NNC Detached. Position NNC No.X.	An NNC blockade occurred.
18	ARRAY NNC Warning. Position NNC No.X.	An NNC partial blockade occurred.

The following table details message text and meaning for the 9500V.

Table 3-22: Message text and meaning (9500V)

No.	Message text	Meaning of message
1	ARRAY Alert Started.	The error monitoring is started.
2	ARRAY FC Drive Detached. ARRAY Detached FC Drive Position Unit No.X HDU No.Y.	An FC drive blockade occurred. (The blocked drive is indicated with a set of a Unit No. and an HDU No.)
3	ARRAY SATA Drive Detached. ARRAY Detached SATA Drive Position Unit No. X HDU No. Y.	A SATA drive blockade occurred. (The blocked drive is indicated with a set of a Unit No. and an HDU No.)
4	ARRAY DC Power Supply Failure.	A DC power supply error occurs.
5	ARRAY Battery Alarm.	A battery voltage error occurred.
6	ARRAY Fan Alarm.	A fan failure occurred.
7	ARRAY CONTROLLER Detached.	A controller blockade occurred. (This occurs only in the dual controller configuration.)
8	ARRAY AC Power Supply Failure.	An AC power supply error occurs.
9	ARRAY Cache Memory Alarm.	A cache failure occurred.
10	ARRAY Cache Backup Circuit Alarm.	A backup circuit failure occurred.
11	ARRAY ENC Alarm.	An enclosure error occurs.

Table 3-22: Message text and meaning (9500V)

12	ARRAY SENC Alarm.	An SENC error occurred.
13	ARRAY Loop Alarm.	A loop error occurs.
14	ARRAY Path Alarm.	A path blockade occurred.
15	ARRAY Warning.	The array unit entered the warning state.
16	ARRAY Storage Navigator Modular Interface error occurred.	A failure occurred in the connection with the array unit. A power OFF or a failure occurred in the array unit.

Referencing/setting the monitoring error options

Command name

auerralertopt

Format

9500V, AMS, WMS, SMS, AMS2000, HUS100

auerralertopt -refer -account

When the monitoring account is not set or changed.

```
auerralertopt -set -account enable
                -uid user_id | -uidfile file_name | -askuid
                [ -passwdfile file_name ]
```

When setting the monitoring account to enable.

```
auerralertopt -set -account enable
```

When setting the monitoring account to disable.

```
auerralertopt -set -account disable
```

```
auerralertopt -test -account [ -unit unit_name ... ]
```

Description

This command references or sets the monitoring error options.

Options

Option	Description
-refer	Displays the monitoring error options.
-set	Sets the monitoring error options.
-test	Tests the monitoring error options.
-account	When the -refer option is specified: Displays the monitoring account information. When the -test option is specified: Authentication tests by the monitoring account.
-account enable disable	Specify whether to set the monitoring account effective or ineffective. enable : Enables the monitoring account. disable: Disables the monitoring account.
-uid <i>user_id</i>	Specify the user ID. <i>user_id</i> : User ID (See Note 1)
-uidfile <i>file_name</i>	Specify the file(path) name when setting the user ID using a file.
-askuid	Specify this option when inputting the user ID for a request.
-passwdfile <i>file_name</i>	Specify the file(path) name when setting the password using a file. <i>file_name</i> : File (path) name
-unit <i>unit_name</i>	Specify the name of the array unit for which to test. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed. If omitted, all array unit subject to monitoring will be tested. Single or multiple array unit names can be specified. Single specification: Specifying a single array unit name. Example: -unit ams2000a1 Multiple specification: Specifying multiple array unit names. Example: -unit ams2000a1 ams2000a2
Note 1: For User ID, less than or equal to 256 ASCII characters (alphabetic characters, numerals, and the following symbols) can be used. (!, #, \$, %, &, ', *, +, -, ., /, =, ?, @, ^, _ ` , {, , }, ~, (space))	

Examples

The following example displays the monitoring errors account information.

```
% auerralertopt -refer -account
Monitoring Account : Enable
USER id : user-acc
%
```

The following example sets the monitoring errors account information.

```
% auerralertopt -set -account -uid User001
Are you sure you want to set the account for monitoring unit? (y/n [n]): y
Please input the password.
Password :
The account for monitoring unit has been set successfully.
%
```

The following example tests the monitoring errors account information.

```
% auerralertopt -test -account
Unit Name                                     Type    Result
ams500                                       AMS500  OK
9500                                         9500V   OK
ams500m                                     AMS500  OK
%
```

Tuning parameters

This section covers the following commands related to tuning parameters:

- [Referencing/setting system tuning parameters on page 3-299](#)
- [Referencing/setting volume tuning parameters on page 3-303](#)
- [Referencing/setting prefetch tuning parameters on page 3-305](#)
- [Referencing/setting multi-stream tuning parameters on page 3-308](#)
- [Referencing/setting volume ownership tuning parameters on page 3-311](#)
- [Setting/deleting the account information for scripts on page 3-312](#)

Referencing/setting system tuning parameters

Command name

ausystuning

Format

9500V

```
ausystuning -unit unit_name -refer
```

When setting the Multi Streaming

```
ausystuning -unit unit_name -set
[ -mspfcount num ]
[ -msnextpf on | off ]
[ -mspfsize 64 | 128 | 256 | 512 | 1024
  | 2048 | 3072 |
  | 4096 | 5120 | 6144 | 7168 |
  | 8192 | 9216 | 10240 ]
```

```
ausystuning -unit unit_name -default MultiStreaming
```

When setting the other configurations

```
ausystuning -unit unit_name -set
[ -dtystart num ]
[ -dtystop num ]
[ -rndbufsize0 enable | disable ]
[ -rndbuf num ]
```

```
ausystuning -unit unit_name -default
```

AMS, WMS

```
ausystuning -unit unit_name -refer
```

```
ausystuning -unit unit_name -set
[ -dtystart num ]
[ -dtystop num ]
[ -cachecontrol FIFO | LRU ]
[ -detailedtrace on | off ]
```

```
ausystuning -unit unit_name -default
```

SMS, AMS2000

```
ausystuning -unit unit_name -refer
```

```
ausystuning -unit unit_name -set
[ -dtystart num ]
[ -dtystop num ]
[ -cachecontrol FIFO | LRU ]
[ -detailedtrace on | off ]
[ -loadbalancing enable | disable ]
[ -loadbalancingtime 3 | 5 | 10 | 15 | 30 | 60 |
  120 | 180 ]
[ -dtynumlimit enable | disable ]
[ -loadreductionchigonf enable | disable ]
```

```
ausystuning -unit unit_name -default
```

HUS100

```
ausystuning -unit unit_name -refer
```

```
ausystuning -unit unit_name -set
[ -dtystart num ]
```

```

[ -dtystop num ]
[ -cachecontrol FIFO | LRU ]
[ -detailedtrace on | off ]
[ -loadbalancing enable | disable ]
[ -loadbalancingtime 3 | 5 | 10 | 15 | 30 | 60
| 120 | 180 ]
[ -dtynumlimit enable | disable ]
[ -loadreductionchgconf enable | disable ]
[ -xcopylowspeed enable | disable ]
[ -iooverloadreport enable | disable ]
ausystuning -unit unit_name -default
[ -iscsitimeoutresettime num ]

```

Description

This command refers to or sets the system tuning parameters.

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of an array unit to which the system tuning parameters is referred or set. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.
-refer	References the system tuning parameters that has been set and reserved.
-set	Sets the system tuning parameters.
-mspfcount <i>num</i>	Specify the condition to make a pre-fetch in the multi-streaming (1 to 10). The setting can be made only when the Multiple Stream Mode is validated.
-msnextsize on off	Specify the time when the next pre-fetch of the multi-streaming is to be made. The setting can be made only when the Multiple Stream Mode is validated. on : Starts the next pre-fetch when the reading is done up to the specified percentage. off: The next pre-fetch is not started as long as a read hit is made.
-mspfsize 64 128 256 512 1024 2048 3072 4096 5120 6144 7168 8192 9216 10240	Specify an amount of data to be pre-fetched in the multi-streaming. The setting can be made only when the Multiple Stream Mode is validated.
-dtystart <i>num</i>	Specify an occasion to de-stage dirty data. (0 to 50)
-dystop <i>num</i>	Specify an occasion to stop the de-staging of dirty data. (0 to 50)
-rndbufsize0 enable disable	Set whether to validate or invalidate the specification of the random simple buffer size as 0%. enable : Enables the specification of the random simple buffer size as 0%. disable: Disables the specification of the random simple buffer size as 0%.
-rndbuf <i>num</i>	Specify a size of the random simplified buffer. (0 to 100) When specifying this option, the disk array subsystem must be restarted in order to validate the setting.
-cachecontrol FIFO LRU	Specify a cache control mode. FIFO: First-in First-out LRU : Least Recently Used

Option	Description
-detailedtrace on off	Specify whether to set the detailed trace mode effective or ineffective. on : Enables the detailed trace mode. off: Disables the detailed trace mode.
-loadbalancing enable disable	Set whether to validate or invalidate the specification of the load balancing. enable : Enables the specification of the load balancing disable: Disables the specification of the load balancing
-loadbalancingtime 3 5 10 15 30 60 120 180	Specify the load balancing monitoring time (minutes).
-default MultiStreaming	Return the parameter for tuning the performance of multi-streaming to the default value. The setting can be made only when the Multiple Stream Mode is validated.
-default	Returns the parameters for performance tuning to their default value.
-dtynumlimit enable disable	Set whether to validate or invalidate the specification of the dirty data flush number limit enable: Enables the specification of the dirty data flush number limit. disable: Disables the specification of the dirty data flush number limit.
-loadreductionchgconf enable disable	Set whether to validate or invalidate the specification of the load reduction for changing configuration mode. enable: Enables the specification of the load reduction for changing configuration mode. disable: Disables the specification of the load reduction for changing configuration mode.
-iooverloadreport enable disable	Set whether to generate a report when the load increases to the point of being more than what the port can manage. enable: Enables report generation for loads higher than the port threshold for I/O loads. disable: Disables report generation for loads higher than the port threshold for I/O loads.
Note 1: For User ID, less than or equal to 256 ASCII characters (alphabetic characters, numerals, and the following symbols) can be used. (!, #, \$, %, &, ', *, +, -, ., /, =, ?, @, ^, _ , ` , { , , } , ~ , (space))	

Examples

The following example displays the system tuning parameters of an array 9500a1.

```
% ausystuning -unit 9500a1 -refer
Password:
Dirty Data Opportunity [%] : 10
Dirty Data Stop Opportunity [%] : 0
Specifying Random Simple Buffer Size 0%
Current Value : disable
New Value : disable
Random Simple Buffer Size [%]
Current Value : 0
New Value : 0
%
```

The following example displays the system tuning parameters of an array **ams500a1**.

```
% ausystuning -unit ams500a1 -refer
Password:
Dirty Data Opportunity [%] : 10
Dirty Data Stop Opportunity [%] : 0
Cache Control Mode : FIFO
Detailed Trace Mode : ON
%
```

The following example displays the system tuning parameters of an array **ams2300a1**.

```
% ausystuning -unit ams2300a1 -refer
Dirty Data Opportunity [%] : 10
Dirty Data Stop Opportunity [%] : 0
Cache Control Mode : FIFO
Detailed Trace Mode : ON
Load Balancing : Enable
Load Balancing Monitoring Time [min.] : 3
Dirty Data Flush Number Limit : Disable
Load Reduction for Changing Configuration Mode : Disable
%
```

The following example displays the system tuning parameters of an array unit **hus150a1**.

```
% ausystuning -unit hus150a1 -refer
Dirty Data Opportunity [%] : 5
Dirty Data Stop Opportunity [%] : 5
Cache Control Mode : FIFO
Detailed Trace Mode : ON
Load Balancing : Enable
Load Balancing Monitoring Time [min.] : 3
Dirty Data Flush Number Limit : Enable
Load Reduction for Changing Configuration Mode : Disable
Extended COPY Low-Speed Mode : Disable
I/O Overload Report Mode: : Disable
iSCSI Timeout Reset Time (sec.) : 45
%
```

The following example sets the I/O Overload Report Mode of an array unit **hus150a1**.

```
% ausystuning -unit hus150a1 -set -iscsitimeoutresettime 20
Are you sure you want to set the system tuning parameter? (y/n [n]): y
The system tuning parameter has been set successfully.
%
```

Referencing/setting volume tuning parameters

Command name

aulutuning

Format

```
9500V
aulutuning -unit unit_name -refer

aulutuning -unit unit_name -set -lu lun ...
          -pfddata disable | num

aulutuning -unit unit_name -default [ -lu lun ]
```

Description

This command refers to or sets the LU tuning parameters.

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of an array unit to which the LU tuning parameters is referred or set. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-" (minus), "_" (underline), "." (period), "@", or " (space)". Space in front and in the rear of the character string is removed.
-refer	References the LU tuning parameters.
-set	Sets the LU tuning parameters.
-default	Returns the parameter for tuning the performance to the default value.
-lu <i>lun</i> ...	Specify number(s) of LU(s) for which to be set the LU tuning parameters. One or more LU number(s) can be specified. However, only a single logical unit can be specified when the -default has been specified. Single or multiple LU numbers can be specified. Single specification : Specifying a single LU number. Example: -lu 3 Multiple specification: Specifying multiple LU numbers. Example: -lu 0 1 2 3 4 5 8 -lu 0-5 8
-pfddata disable <i>num</i>	Specify the time to start the pre-fetch. disable: The pre-fetch is not started. <i>num</i> : Specify the condition to start the next pre-fetch, that is, a percentage of data to be pre-fetched that has been read (0 to 100).

Example

The following example displays the logical unit tuning parameters of an array 9500a1.

```
% autuning -unit 9500a1 -refer
Password:
LU 0
  Prefetch Starting Opportunity [%] : 50
LU 1
  Prefetch Starting Opportunity [%] : 50
  :
  :
%
```

Referencing/setting prefetch tuning parameters

Command name

autuningprefetch

Format

```
AMS, WMS
autuningprefetch -unit unit_name -refer

When the multi stream of LU is effective.
autuningprefetch -unit unit_name -set
[ -seqcount num ]
[ -fixedsize num ]
[ -basesize num ]
[ -lu lun ... ]

When the multi stream of LU is ineffective.
autuningprefetch -unit unit_name -set
[ -multistreamread enable | disable ]
[ -multistreamwrite enable | disable ]
[ -multistreamnext on | off ]
[ -seqcount num ]
[ -criteria fixed | base ]
[ -size num -lu lun ... ]

autuningprefetch -unit unit_name -default
```

Description

This command refers to or sets the performance tuning parameters (enable/disable of the multi-stream mode (read/write), decided sequential number, criteria for the pre-fetch, and size of data to be pre-fetched per logical unit).

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of the array unit to which the performance tuning parameters is referred or set. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.
-refer	References the performance tuning parameters.
-set	Sets the performance tuning parameters.
-default	Returns the performance tuning parameters to the default value.
-multistreamread enable disable	Sets whether to validate or invalidate the specification of the multi-stream read. enable : Enables the specification of the multi-stream read. disable: Disables the specification of the multi-stream read.
-multistreamwrite enable disable	Sets whether to validate or invalidate the specification of the multi-stream write. enable : Enables the specification of the multi-stream write. disable: Disables the specification of the multi-stream write.
-multistreamnext on off	Specify whether or not to do the following pre-fetch in the multi-stream mode. The specification can be made only when the multi-stream mode (read) is valid. on: When a reading is done up to the preset extent out of the data pre-fetched, the following pre-fetch is done. off: No pre-fetch is done as long as the pre-fetched data makes a hit.
-seqcount <i>num</i>	Specify the decided sequential number (0 to 10).
-criteria fixed base	Specify the criteria for the pre-fetch. fixed: Use the fixed size of data to be pre-fetched as the criteria. base : Use the base size of data to be pre-fetched as the criteria. The specification can be made only when the multi-stream mode (read) is invalid.

Option	Description
-size <i>num</i>	Specify the size of data to be pre-fetched for an LU (1 to 65535 [KB]). Specify the fixed size of data to be pre-fetched when the pre-fetch criteria is fixed or the basic size of data to be pre-fetched when the criteria is base.
-lu <i>lun ...</i>	Specify a number of an LU. Single or multiple LU numbers can be specified. Single specification : Specifying a single LU number. Example: -lu 3 Multiple specification: Specifying multiple LU numbers. Example: -lu 0 1 2 3 4 5 8 -lu 0-5 8
-fixedsize <i>num</i>	Specify the fixed size of pre-fetched data (1 to 65535 [KB])
-basesize <i>num</i>	Specify the base size of pre-fetched data (1 to 65535 [KB]).

Example

The following example displays the pre-fetch tuning parameters of an array `ams500a1`.

```
% autuningprefetch -unit ams500a1 -refer
Password:
Count of Judgment Sequential : 2
Prefetch Size
  LUN Fixed  Base  RAID Level
    0 256KB 128KB  5( 4D+1P)
  :
  :
  :
%
```

Referencing/setting multi-stream tuning parameters

Command name

autuningmultistream

Format

```
AMS, WMS, SMS, AMS2000, HUS100
autuningmultistream -unit unit_name -refer

AMS, WMS
autuningmultistream -unit unit_name -set
                    -scope system | lu
                    [ -lu lun ... ]
                    [ -read enable | disable ]
                    [ -write enable | disable ]
                    [ -next enable | disable ]
                    [ -criteria fixed | base ]

SMS, AMS2000, HUS100
autuningmultistream -unit unit_name -set
                    -scope system | lu
                    [ -lu lun ... ]
                    [ -readwrite enable | disable ]
                    [ -next enable | disable ]
                    [ -criteria fixed | base ]
                    [ -seqcount num ]
                    [ -fixedsize num ]
                    [ -basesize num ]

AMS, WMS, SMS, AMS2000, HUS100
autuningmultistream -unit unit_name -default
```

Description

This command refers to or sets the multi stream tuning parameters (enable/disable of the read/write mode, following pre-fetch, and criteria for the pre-fetch).

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of the array unit to which the multi stream tuning parameters is referred or set. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.
-refer	References the multi stream tuning parameters.
-set	Sets the multi stream tuning parameters.
-default	Returns the multi stream tuning parameters to the default value.
-scope system lu	Specify the scope. system: system lu : logical unit
-lu <i>lun ...</i>	Specify a number of an LU. Single or multiple LU numbers can be specified. Single specification : Specifying a single LU number. Example: -lu 3 Multiple specification: Specifying multiple LU numbers. Example: -lu 0 1 2 3 4 5 8 -lu 0-5 8
-read enable disable	Sets whether to validate or invalidate the specification of the read mode. enable : Enables the specification of the read mode. disable: Disables the specification of the read mode.
-write enable disable	Sets whether to validate or invalidate the specification of the write mode. enable : Enables the specification of the write mode. disable: Disables the specification of the write mode.
-readwrite enable disable	Sets whether to validate or invalidate the specification of the read/write mode. When the read/write mode is invalid, the mode is the read mode.

Option	Description
-next enable disable	Specify whether or not to do the following pre-fetch. When the scope is the system: The specification can be made only when the read mode is valid. When the scope is the logical unit: The specification can be made only when the read mode of all specified LU is valid. enable : When a reading is done up to the preset extent out of the data pre-fetched, the following pre-fetch is done. disable: No pre-fetch is done as long as the pre-fetched data makes a hit.
-criteria fixed base	Specify the criteria for the pre-fetch. fixed: Use the fixed size of data to be pre-fetched as the criteria. base : Use the base size of data to be pre-fetched as the criteria. When the scope is the system: The specification can be made only when the read mode is invalid. When the scope is the logical unit: The specification can be made only when the read mode of all specified LU is invalid.
-seqcount <i>num</i>	Specify the criteria for the pre-fetch. fixed: Use the fixed size of data to be pre-fetched as the criteria. base : Use the base size of data to be pre-fetched as the criteria. When the scope is the system: The specification can be made only when the read mode is invalid. When the scope is the logical unit: The specification can be made only when the read mode of all specified LU is invalid.
-seqcount <i>num</i>	Specify the decided sequential number (0 to 10).
-fixedsize <i>num</i>	Specify the fixed size of pre-fetched data (1 to 65535 [KB]).
-basesize <i>num</i>	Specify the base size of pre-fetched data (1 to 65535 [KB]).

Example

The following example displays the multi-stream tuning parameters of an array `ams500a1`.

```
% autuningmultistream -unit ams500a1 -refer
Password:
Scope : System
```

```

Mode/Prefetch Information
LUN Mode Prefetch Next Prefetch Criteria
ALL Normal Disable Base
%
```

Referencing/setting volume ownership tuning parameters

Command name

autuningluown

Format

```

SMS, AMS2000, HUS100
autuningluown -unit unit_name -refer [ -lu lun ... ]

autuningluown -unit unit_name -set -lu lun
               -ctl0 | -ctl1[ -coreX | -coreY ]
```

Description

This command references or sets the LU ownership tuning parameters.

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of the array unit for which to reference or set the LU ownership tuning parameters. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.
-set	Sets the LU ownership tuning parameters.
-lu <i>lun</i> ...	Specify an LU number. Single or multiple LU numbers can be specified. Single specification : Specifying a single LU number. Example: -lu 3 Multiple specification: Specifying multiple LU numbers. Example: -lu 0 1 2 3 4 5 8 -lu 0-5 8
-ctl0 -ctl1	Specify the controller.
coreX -ctl1	Specify this option when changing the core.

Examples

The following example displays the logical unit ownership tuning parameters of an array sms100a1.

```

% autuningluown -unit sms100a1 -refer
LU CTL Core RAID Group DP Pool Cache Partition Type
0 0 N/A 0 N/A 0 SAS
```

```

1 0 N/A 0 N/A 0 SAS
2 1 N/A 0 N/A 1 SAS
%
```

The following example sets the logical unit ownership tuning parameters of an array sms100a1.

```

% autuningluown -unit sms100a1 -set -lu 0 -ctl0
Are you sure you want to set the LU ownership?
(y/n [n]): y
The LU ownership has been set successfully.
%
```

Setting/deleting the account information for scripts

Command name

auaccountenv

Format

```

AMS, WMS, SMS, AMS2000, HUS100
auaccountenv -set -uid user_id | -uidfile file_name | -
askuid [ -passwdfile file_name ] [ -authentication [ -unit
unit_name ... ] ]

auaccountenv -rm
```

Description

This command set deletes or tests the account information for the registered storage system unit.

Options

Option	Description
-set	Sets the account information.
-rm	Deletes the account information.
-test	Tests the account information
-uid <i>user_id</i>	Specify the user ID. <i>user_id</i> : User ID (See Note 1)
-uidfile <i>file_name</i>	Specify the file(path) name when setting the user ID using a file. <i>file_name</i> : file (path) name
-askuid	Specify this option when inputting the user ID for a request.
-passwdfile <i>file_name</i>	Specify the file (path) name when setting the password using a file. <i>file_name</i> : file (path) name
-authentication	Tests the account informatoin for the registered array unit.

Option	Description
-unit <i>unit_name</i>	Specify the name of the array unit for which to test. Space in front and in the rear of the character string is removed. If omitted, all array unit subject to registering will be tested. Single or multiple array unit names can be specified. Single specification: Specifying a single array unit name. Example: -unit ams2000a1 Multiple specification: Specifying multiple array unit names. Example: -unit ams2000a1 ams2000a2
Note 1: For User ID, less than or equal to 256 ASCII characters (alphabetic characters, numerals, and the following symbols) can be used. (!, #, \$, %, &, ', *, +, -, ., /, =, ?, @, ^, _ , ` , { , , } , ~ , (space))	

When executing this command for an array whose Account Authentication function is valid, the input request at the time of the command execution can make the input unnecessary by executing this command. However, to make the input unnecessary, it is required to set the STONAVM_ACT environment variable to “on” before actually executing the command with the prerequisite that this command is executed.



NOTE: There are the characters that cannot be used in the command line. When using “!”, “#”, “\$”, “&”, “'”, “*”, “?”, “`”, “{”, “|”, or “~” for the **-uid** option, set the file by using the **-uidfile** option. When “!”, “#”, “\$”, “&”, “'”, “\*”, “?”, “`”, “{”, “|”, or “~” is used for the **-uid** option, the command may terminate abnormally or the illegal user ID may be set.

Examples

The following example sets the account information.

```
% auaccountenv -set -uid User001
Are you sure you want to set the account information? (y/n [n]): y
Please input password.
Password:
The account information has been set successfully.
%
```

The following example sets the account information using the password file.

```
% auaccountenv -set -uid User001 -passwdfile pass.txt
Are you sure you want to set the account information? (y/n [n]): y
The account information has been set successfully.
Are you sure you want to delete the password file? (y/n [n]): y
The password file has been deleted successfully.
%
```

The following example sets the account information specifying the storage system unit.

```
% auaccountenv -set -uid User001 -authentication -unit sms100a1
Are you sure you want to test the account information? [y/n] [n]: y
Please input password.
Password:
Unit Name:    Result
sms100a1     Failed(DMEC0022)
09: The Account Authentication is done lock or disable.
Are you sure you want to set the account information? [y/n] [n]: y
The account information has been set successfully.
%
```

The following example deletes the account information.

```
% auaccountenv -rm
Are you sure you want to delete the account information? (y/n [n]): y
The account information has been deleted successfully.
%
```

The following example tests the account information specifying the storage system unit.

```
% auaccountenv -test -authentication -unit sms100a1
Are you sure you want to test for account information? (y/n [n]): y
Unit Name:    Result
sms100a1     Failed(DMEC0022)
09: The Account Authentication is done lock or disable.
%
```

Miscellaneous commands

This section covers miscellaneous commands for the following topics:

- [Displaying statistical information on page 3-316](#)
- [Outputting performance information file on page 3-317](#)
- [Referencing/setting the collection state of performance statistics on page 3-345](#)
- [Downloading/updating firmware on page 3-347](#)

Setting a password in administration mode

Command name

aupasswd

Format

9500V, AMS, WMS
aupasswd

Description

This command sets a new password used in administration mode to execute administration commands. This command also changes passwords.

The administration commands are used when operating the 9500V and AMS/WMS.

When setting a new password, enter the new password twice. When changing the password, enter an already-set password and then enter a new password.

Specify the password in less than or equal to 12 characters using alphanumeric characters or the following symbols. (!, #, \$, %, &, ', *, +, -, ., /, =, ?, @, ^, _ , {, |, ~, ", (,), , , : , ; , < , > , [, \ ,])

Examples

The following example sets a new password used in administration mode.

```
% aupasswd
New password: (Enters a password to be set newly.)
Retype new password: (Enters the same password as above.)
%
```

The following example changes a password used in administration mode.

```
% aupasswd
Old password: (Enters an already-set password.)
New password: (Enters a new password.)
Retype new password: (Enters the same password as above.)
%
```

Displaying statistical information

Command name

austatistics

Format

```
9500V
austatistics -unit unit_name -memory | -drive

AMS, WMS
austatistics -unit unit_name
```

Description

This command displays the statistical information that has been accumulated in the array. The following items will be displayed.

- Controller use condition
- Number of host commands received
- Command execution condition
- Cache load condition

Options

Option	Description
-unit unit_name -memory -drive	Specify the name of an array unit in which the statistical information is to be displayed. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed. Specify the location of the statistical information to be displayed. -memory: The statistical information (the current information) in the current memory will be displayed. -drive : The statistical information stored in the system drive (the information at the time of activating the array unit) will be displayed.

Example

The following example displays the statistical information of an array 9500a1.

```
% austatistics -unit 9500a1 -memory
Controller
Array Time
  Controller Acting Time (Integrated) [minute(s)] : 4676
  Controller Acting Time (Work) [m second] : 256969390
CTL0
  Power On Times : 22
CTL1
  Power On Times : 22

Host Commands
CTL LU READ WRITE
0 0 2677 3261
0 1 2752 2835
. . .
. . .
1 511 0 0

Execution
CTL LU Reads Writes Sequential Sequential Prefetch Write Through
Cache Hits Cache Hits Reads Writes Stagings Operation
0 0 1067 2904 384 424 31229 0
0 1 969 2651 387 386 30291 0
. . .
. . .

Cache Load
Number of Inflow Threshold Reached
CTL0 : 0
CTL1 : 0
%
```

Outputting performance information file

Command name

auperform

Format

```
9500V
auperform -unit unit_name -manual [ -cat ] [ -lu lun
... ]
[ -path path_name ]

auperform -unit unit_name -manual -pfmstatis
[ -cat ]
[ -portinfo ]
[ -rginfo [ rg_no ... ] ]
[ -luinfo [ lun ... ] ]
[ -cacheinfo ]
[ -processorinfo ]
[ -driveinfo [ unit_no.hdu_no ... ] ]
[ -driveoprinfo [ unit_no.hdu_no ... ] ]
[ -backendinfo [ path_no.loop_no ... ] ]
[ -path path_name ]

auperform -unit unit_name -auto time [ -count n ] [
-cat ] [ -lu lun ... ]
[ -path path_name ]

auperform -unit unit_name -auto time -pfmstatis
[ -count n ]
[ -cat ]
```

```

[ -portinfo ]
[ -rginfo [ rg_no ... ] ]
[ -luinfo [ lun ... ] ]
[ -cacheinfo ]
[ -processorinfo ]
[ -driveinfo [ unit_no.hdu_no ... ] ]
[ -driveoprinfo [ unit_no.hdu_no ... ] ]
[ -backendinfo [ path_no.loop_no ... ] ]
[ -path path_name ]

AMS, WMS
aupperform -unit unit_name -manual -pfmstatis
[ -cat ]
[ -portinfo ctl_no [ port_no ... ] ]
[ -rginfo ctl_no [ rg_no ... ] ]
[ -luinfo ctl_no [ lun ... ] ]
[ -cacheinfo ctl_no ]
[ -processorinfo ctl_no ]
[ -driveinfo ctl_no [ unit_no.hdu_no ... ] ]
[ -driveoprinfo ctl_no [ unit_no.hdu_no ... ] ]
] ]
[ -backendinfo ctl_no [ path_no.loop_no ... ] ]
] ]
[ -path path_name ]

aupperform -unit unit_name -auto time -pfmstatis
[ -count n ]
[ -cat ]
[ -portinfo ctl_no [ port_no ... ] ]
[ -rginfo ctl_no [ rg_no ... ] ]
[ -luinfo ctl_no [ lun ... ] ]
[ -cacheinfo ctl_no ]
[ -processorinfo ctl_no ]
[ -driveinfo ctl_no [ unit_no.hdu_no ... ] ]
[ -driveoprinfo ctl_no [ unit_no.hdu_no ... ] ]
[ -backendinfo ctl_no [ path_no.loop_no ... ] ]
[ -path path_name ]

SMS
aupperform -unit unit_name -manual -pfmstatis
[ -cat ]
[ -portinfo ctl_no [ port_no ... ] ]
[ -rginfo ctl_no [ rg_no ... ] ]
[ -luinfo ctl_no [ lun ... ] ]
[ -cacheinfo ctl_no ]
[ -processorinfo ctl_no ]
[ -driveinfo ctl_no [ unit_no.hdu_no ... ] ]
[ -driveoprinfo ctl_no [ unit_no.hdu_no ... ] ]
[ -backendinfo ctl_no [ path_no ... ] ]
[ -path path_name ]

aupperform -unit unit_name -auto time -pfmstatis
[ -count n ]
[ -cat ]
[ -portinfo ctl_no [ port_no ... ] ]
[ -rginfo ctl_no [ rg_no ... ] ]
[ -luinfo ctl_no [ lun ... ] ]
[ -cacheinfo ctl_no ]
[ -processorinfo ctl_no ]
[ -driveinfo ctl_no [ unit_no.hdu_no ... ] ]
[ -driveoprinfo ctl_no [ unit_no.hdu_no ... ] ]
[ -backendinfo ctl_no [ path_no ... ] ]

```

```
[ -path path_name ]
[ -neterrorskip ]
```

AMS2000

```
superform -unit unit_name -manual -pfmstatus
[ -cat ]
[ -portinfo ctl_no [ port_no ... ] ]
[ -rginfo ctl_no [ rg_no ... ] ]
[ -dppoolinfo ctl_no [ rg_no ... ] ]
[ -luninfo ctl_no [ lun ... ] ]
[ -cacheinfo ctl_no ]
[ -processorinfo ctl_no ]
[ -driveinfo ctl_no [ unit_no.hdu_no ... ] ]
[ -backendinfo ctl_no [ path_no ... ] ]
[ -path path_name ]
```

```
superform -unit unit name -auto time -pfmstatus
[ -count n ]
[ -cat ]
[ -portinfo ctl_no [ port_no ... ] ]
[ -rginfo ctl_no [ rg_no ... ] ]
[ -dppoolinfo ctl_no [ pool_no ... ] ]
[ -luinfo ctl_no [ lun ... ] ]
[ -cacheinfo ctl_no ... ] ]
[ -processorinfo ctl_no ... ] ]
[ -driveinfo ctl_no [ unit_no.hdu_no ... ] ]
[ -driveoprinfo ctl_no [ unit_no.hdu_no ... ] ]
[ -backendinfo ctl_no [ path_no ... ] ]
[ -path path_name ]
[ -neterrorskip ]
```

HUS100

```
superform -unit unit_name -manual -pfmstatus
[ -cat ]
[ -portinfo ctl_no [ port_no ... ] ]
[ -rginfo ctl_no [ rg_no ... ] ]
[ -dppoolinfo ctl_no [ rg_no ... ] ]
[ -luninfo ctl_no [ lun ... ] ]
[ -cacheinfo ctl_no ]
[ -processorinfo ctl_no [ core ] ]
[ -driveinfo ctl_no [ unit_no.hdu_no ... ] ]
[ -driveoprinfo ctl_no [ unit_no.hdu_no ... ] ]
[ -backendinfo ctl_no [ path_no ... ] ]
[ -mngareainfo ctl_no [ core ] ]
[ [ -mngrginfo [ rg_no ... ] ] ]
[ [ -mngdppoolinfo [ pool_no ... ] ] ]
[ [ [ -mngdmluinfo ] ] ] ]
[ -path path_name ]
```

```
superform -unit unit name -auto time -pfmstatus
[ -count n ]
[ -cat ]
[ -portinfo ctl_no [ port_no ... ] ]
[ -rginfo ctl_no [ rg_no ... ] ]
[ -dppoolinfo ctl_no [ pool_no ... ] ]
[ -luinfo ctl_no [ lun ... ] ]
[ -cacheinfo ctl_no ... ] ]
[ -processorinfo ctl_no [ core ] ]
[ -driveinfo ctl_no [ unit_no.hdu_no ... ] ]
[ -driveoprinfo ctl_no [ unit_no.hdu_no ... ] ]
[ -backendinfo ctl_no [ path_no ... ] ]
[ -mngareainfo ctl_no [ core ] ]
[ [ -mngrginfo [ rg_no ... ] ] ]
```

```
[ [ -mngdppoolinfo [ pool_no ... ] ]
[ [ -mngdmluinfo ] ] ]
[ -path path_name ]
[ -neterrorskip ]
```

Description

This command acquires the command operational condition and performance statistics information in an array, and outputs their respective information in a text-file format into the current or specified directory. When displaying an output file, a warning message may be reported depending on the editor. However, the contents will be displayed correctly.

The following information will be acquired:

When the `-pfmstatus` option is absent:

- Number of Read commands received (Read CMD Count)
- Number of the cache-hit Read commands received within the Read command (Read CMD Hit Count)
- Rate of cache-hitting within the received Read command (Rate/Read Hit)
- Number of Write commands received (Write CMD Count)
- Number Write commands that had been cache-hit within the received Write command (Write CMD Hit Count)
- Rate of cache-hitting within the received Write command (Rate/Write Hit)

When the `-pfmstatus` option is present:

In addition to the six above information, the following performance statistics information is acquired.

- Received number of Read/Write commands per second (IO Rate)
- Received number of Read commands per second (Read Rate)
- Received number of Write commands per second (Write Rate)
- Transfer size of Read/Write commands per second (Trans. Rate)
- Transfer size of Read commands per second (Read Trans. Rate)
- Transfer size of Write commands per second (Write Trans. Rate)
- Transfer size of Read commands (Read Trans. Size)
- Transfer size of Write commands (Write Trans. Size)
- Rate of cache usage capacity within the cache capacity (Cache Write Pending Rate)
- Number of Online Verify commands per second (Online Verify Rate)
- Number of Online Verify commands (Online Verify CMD Count)
- Operation rate of the processor (Usage)

- Operation rate of the drive (HDU Operating Rate)
- Tag count (Tag Count)
- Clean cache usage rate (Cache Clean Queue Usage Rate)
- Middle cache usage rate (Cache Middle Queue Usage Rate)
- Physical cache usage rate (Cache Physical Queue Usage Rate)
- Total cache usage rate (Cache Total Queue Usage Rate)
- Received number of Initiator Control commands per second (CTL CMD IO Rate)
- Received number of Initiator Data commands per second (Data CMD IO Rate)
- Transfer size of Initiator Control commands per second (CTL CMD Trans. Rate)
- Transfer size of Initiator Data commands per second (Data CMD Trans. Rate)
- Response time of Initiator Control commands (CTL CMD Time)
- Response time of Initiator Data commands (Data CMD Time)
- Max response time of Initiator Control commands (CTL CMD Max Time)
- Max response time of Initiator Data commands (Data CMD Max Time)
- Received number of Initiator Control commands (CTL CMD Count)
- Received number of Initiator Data commands (Data CMD Count)
- Transfer size of Initiator Control commands (CTL CMD Trans. Size)
- Transfer size of Initiator Data commands (Data CMD Trans. Size)
- Average Tag Count (Average Tag Count)
- Total Tag Count (Total Tag Count)
- Read Tag Count (Read Tag Count)
- Write Tag Count (Write Tag Count)
- Average Total Tag Count (Average Total Tag Count)
- Average Read Tag Count (Average Read Tag Count)
- Average Write Tag Count (Average Write Tag Count)
- Timeout error count (TimeoutError Count)
- Read/Write commands hit information (Read/Write CMD Hit)
- Read/Write commands miss information (Read/Write CMD Miss)
- Read/Write commands job information (Read/Write CMD Job)
- Unload time (Unload Time)
- Received number of Random Read/Write commands per second (Random IO Rate)

- Received number of Random Read commands per second (Random Read Rate)
- Received number of Random Write commands per second (Random Write Rate)
- Transfer size of Random Read/Write commands per second (Random Trans. Rate)
- Transfer size of Random Read commands per second (Random Read Trans. Rate)
- Transfer size of Random Write commands per second (Random Write Trans. Rate)
- Received number of Random Read commands (Random Read CMD Count)
- Received number of Random Write commands (Random Write CMD Count)
- Transfer size of Random Read commands (Random Read Trans. Size)
- Transfer size of Random Write commands (Random Write Trans. Size)
- Received number of Sequential Read/Write commands per second (Sequential IO Rate)
- Received number of Sequential Read commands per second (Sequential Read Rate)
- Received number of Sequential Write commands per second (Sequential Write Rate)
- Transfer size of Sequential Read/Write commands per second (Sequential Trans. Rate)
- Transfer size of Sequential Read commands per second (Sequential Read Trans. Rate)
- Transfer size of Sequential Write commands per second (Sequential Write Trans. Rate)
- Received number of Sequential Read commands (Sequential Read CMD Count)
- Received number of Sequential Write commands (Sequential Write CMD Count)
- Transfer size of Sequential Read commands (Sequential Read Trans. Size)
- Transfer size of Sequential Write commands (Sequential Write Trans. Size)
- Received number of XCOPY commands per second (XCOPY Rate)
- Received number of XCOPY Read commands per second (XCOPY Read Rate)
- Received number of XCOPY Write commands per second (XCOPY Write Rate)

- Transfer size of XCOPY Read commands per second (XCOPY Read Trans. Rate)
- Transfer size of XCOPY Write commands per second (XCOPY Write Trans. Rate)
- Response time of XCOPY commands (XCOPY Time)
- Max response time of XCOPY commands (XCOPY Max Time)
- Total tag count (Total Tag Count) (See Note 1)
- Read/Write tag count (Read/Write Tag Count)
- Total average tag count (Total Average Tag Count)(See Note 1)
- Read/Write average tag count (Read?Write Average Tag Count)
- Rate of cache-hitting within the management area (Cache Hit Rate)
- Access count of management area (Access Count)

The output file names are as follows:

When the **-pfmstatus** option is absent:

When the **-cat** option is present:

- “**pfms.txt**” for a single configuration
- “**pfmd.txt**” for a dual configuration

When the **-cat** option is absent:

- For acquiring manually: “**pfmsXXXXX.txt**” for a single configuration, and “**pfmdXXXXX.txt**” for a dual configuration
- For acquiring automatically: “**pfmsXXXXX.txt**” for a single configuration, and “**pfmdXXXXX.txt**” for a dual configuration
- (“XXXXX” is a number from 00000 to 19999.)

When the **-pfmstatus** option is present:

When the **-cat** option is present: “**pfm.txt**”

When the **-cat** option is absent:

- For acquiring manually: “**pfmXXXXX.txt**”
- For acquiring automatically: “**pfmXXXXX.txt**”
- (“XXXXX” is a number from 00000 to 19999.)



NOTE: The tag count and the total tag count output are the same value. The average tag count and the total average tag count output are the same value.

NOTE: All information is output to the files at once if the **-pfmstatus** option is specified, without the following options:

-portinfo
-rginfo
-dppoolinfo
-luinfo
-cacheinfo
-processorinfo
-driveinfo
-driveoprinfo
-backendinfo
-tapelibraryinfo
-mngareainfo

The data size varies in proportion to the number of times of the output is specified.

Required disk capacity: The following data size x the number of times the output is specified.

AMS2500: 25.1 MB, AMS2300: 24.9 MB, AMS2100/AMS2010: 12.5 MB,
AMS1000: 16.5 MB, AMS500: 8.26 MB, AMS200/WMS100: 2.11 MB, 9580V:
3.92 MB, 9500V: 1.07 MB, HUS 150: 24.7 MB, HUS 130 23.9 MB, HUS110: 12.0
MB

All information is output to the files at once if the **-pfmstatus** option is specified, without the following options:

- -portinfo
- -rginfo
- -dppoolinfo
- -luinfo
- -cacheinfo
- -processorinfo
- -driveinfo
- -driveoprinfo
- -backendinfo
- -tapelibraryinfo
- -mngareainfo

The data size varies in proportion to the number of times of the output is specified. The required disk capacity is the following data size x the number of times the output is specified.

- AMS2500: 25.1 MB
- AMS2300: 24.9 MB

- AMS2100/AMS2010: 12.5 MB
- AMS1000: 16.5 MB
- AMS500: 8.26 MB
- AMS200/WMS100: 2.11 MB
- 9580V: 3.92 MB
- 9500V: 1.07 MB

When the `-mngareainfo` option is issued without the `-mngrginfo`, `-mngdppoolinfo`, and `-mngdmuinfo` options, the console displays all the management area information of RAID group, DP pool, DM-LU

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of an array unit in which the performance information is to be acquired. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.
-manual	Acquires the performance information manually.
-auto <i>time</i>	Automatically acquires the performance information at specified interval of time (1 to 1439 minutes).
-count <i>n</i>	If automatically acquisition is specified, specify the number of times to repeat the acquisition (1 to 20000).
-cat	Specify this option when outputting files making them concatenated as one file.
-path <i>path_name</i>	Specify the directory in which the performance information is to be acquired. If omitted, the information is outputted into the current directory.
-pfmstat	Specify this option when outputting the performance statistics information.

9500V only

Option	Description
-lu <i>lu ...</i>	When outputting performance information of an optional logical unit, specify the logical unit number to be output. When doing that, enter the logical unit number using numerals or a hyphen(s) (-). If the specification is omitted, the information about all logical units is output. Single or multiple logical unit numbers can be specified. Single specification : Specifying a single logical unit number. Example: -lu 3 Multiple specification: Specifying multiple logical unit numbers. Example: -lu 0 1 2 3 4 5 8 -lu 0-5 8
-portinfo	Specify this option when outputting the performance statistics information of port.

Option	Description
-rginfo [<i>rg_no</i> ...]	When outputting performance statistics information of RAID group, specify the RAID group number to be output. When doing that, enter the RAID group number using numerals or hyphen(s) (-). If the specification of RAID group number is omitted, the information about all RAID group is output. Single or multiple RAID group numbers can be specified. Single specification : Specifying a single RAID group number. Example: -rginfo 3 Multiple specification: Specifying multiple RAID group numbers. Example: -rginfo 0 1 2 3 4 5 8 -rginfo 0-5 8
-luinfo [<i>lun</i> ...]	When outputting performance statistics information of logical unit, specify the logical unit number to be output. When doing that, enter the logical unit number using numerals or a hyphen(s) (-). If the specification of logical unit number is omitted, the information about all logical units is output. Single or multiple logical unit numbers can be specified. Single specification : Specifying a single logical unit number. Example: -luinfo 3 Multiple specification: Specifying multiple logical unit numbers. Example: -luinfo 0 1 2 3 4 5 8 -luinfo 0-5 8
-cacheinfo	Specify this option when outputting the performance statistics information of cache.
-processorinfo	Specify this option when outputting the performance statistics information of processor.
-driveinfo [<i>unit_no.hdu_no</i> ...]	When outputting statistical information on the drive performance, specify the Unit number and HDU number punctuating them with a period. When doing that, enter the Unit number and HDU number using numerals or hyphen(s) (-). If the specification of Unit number and HDU number is omitted, the information about all the drives is output. Single or multiple Unit numbers and HDU numbers can be specified. Single specification : Specifying a single drive number. Example: -driveinfo 1.0 Multiple specification: Specifying multiple drives numbers. Example: -driveinfo 1.0 2.3 3.1 -driveinfo 1.0-2.2 2.8

Option	Description
-driveoprinfo [<i>unit_no.hdu_no ...</i>]	When outputting statistical information on the drive operation performance, specify the Unit number and HDU number punctuating them with a period. When doing that, enter the Unit number and HDU number using numerals or hyphen(s) (-). If the specification of Unit number and HDU number is omitted, the information about all the drives operation is output. Single or multiple Unit numbers and HDU numbers can be specified. Single specification : Specifying a single drive number. Example: -driveoprinfo 1.0 Multiple specification: Specifying multiple drives numbers. Example: -driveoprinfo 1.0 2.3 3.1 -driveoprinfo 1.0-2.2 2.8
-backendinfo [<i>path_no.loop_no ...</i>]	When outputting statistical information on the back-end performance, specify the path number and loop number punctuating them with a period. When doing that, enter the path number and loop number using numerals or hyphen(s) (-). If the specification of path number and loop number is omitted, the information about all the back-end is output. Single or multiple path numbers and loop numbers can be specified. Single specification : Specifying a single path number and loop number. Example: -backendinfo 0.0 Multiple specification: Specifying multiple path numbers and loop number. Example: -backendinfo 0.0 1.0 -backendinfo 0.0-1.0

For AMS, WMS, SMS, and AMS2000:

Option	Description
-portinfo <i>ctl_no</i> [<i>port_no ...</i>]	Specify this option when outputting the performance statistics information of port. If the specification of port number is omitted, the information about all ports is output. <i>ctl_no</i> : Controller number (0, 1)

Option	Description
-rginfo <i>ctl_no</i> [<i>rg_no ...</i>]	When outputting performance statistics information of RAID group, specify the RAID group number to be output. <i>ctl_no</i> : Controller number (0, 1) When doing that, enter the RAID group number using numerals or hyphen(s) (-). If the specification of RAID group number is omitted, the information about all defined RAID group is output. Single or multiple RAID group numbers can be specified. Single specification : Specifying a single RAID group number. Example: -rginfo 0 3 Multiple specification: Specifying multiple RAID group numbers. Example: -rginfo 0 0 1 2 3 4 5 8 -rginfo 0 0-5 8
-luinfo <i>ctl_no</i> [lun ...]	When outputting performance statistics information of logical unit, specify the logical unit number to be output. <i>ctl_no</i> : Controller number (0, 1) When doing that, enter the logical unit number using numerals or a hyphen(s) (-). If the specification of logical unit number is omitted, the information about all defined logical units is output. Single or multiple logical unit numbers can be specified. Single specification : Specifying a single logical unit number. Example: -luinfo 0 3 Multiple specification: Specifying multiple logical unit numbers. Example: -luinfo 0 0
-cacheinfo <i>ctl_no</i>	Specify this option when outputting the performance statistics information of cache. <i>ctl_no</i> : Controller number (0, 1)
-processorinfo <i>ctl_no</i>	Specify this option when outputting the performance statistics information of processor. <i>ctl_no</i> : Controller number (0, 1)

Option	Description
-driveinfo <i>ctl_no</i> [<i>unit_no.hdu_no ...</i>]	When outputting statistical information on the drive performance, specify the Unit number and HDU number punctuating them with a period. <i>ctl_no</i> : Controller number (0, 1) When doing that, enter the Unit number and HDU number using numerals or hyphen(s) (-). If the specification of Unit number and HDU number is omitted, the information about all the drives is output. Single or multiple Unit numbers and HDU numbers can be specified. Single specification : Specifying a single drive number. Example: -driveinfo 0 1.0 Multiple specification: Specifying multiple drives numbers. Example: -driveinfo 0 1.0 2.3 3.1 -driveinfo 0 1.0-2.2 2.8
-driveoprinfo <i>ctl_no</i> [<i>unit_no.hdu_no ...</i>]	When outputting statistical information on the drive operation performance, specify the Unit number and HDU number punctuating them with a period. <i>ctl_no</i> : Controller number (0, 1) When doing that, enter the Unit number and HDU number using numerals or hyphen(s) (-). If the specification of Unit number and HDU number is omitted, the information about all the drives operation is output. Single or multiple Unit numbers and HDU numbers can be specified. Single specification : Specifying a single drive number. Example: -driveoprinfo 0 1.0 Multiple specification: Specifying multiple drives numbers. Example: -driveoprinfo 0 1.0 2.3 3.1 -driveoprinfo 0 1.0-2.2 2.8

For AMS and WMS:

Option	Description
<code>-backendinfo ctl_no [path_no.loop_no ...]</code>	When outputting statistical information on the back-end performance, specify the path number and loop number punctuating them with a period. <i>ctl_no</i> : Controller number (0, 1) When doing that, enter the path number and loop number using numerals or hyphen(s) (-). If the specification of path number and loop number is omitted, the information about all the back-end is output. Single or multiple path numbers and loop numbers can be specified. Single specification : Specifying a single path number and loop number. Example: <code>-backendinfo 0 0.0</code> Multiple specification: Specifying multiple path numbers and loop numbers. Example: <code>-backendinfo 0 0.0 1.0</code> <code>-backendinfo 0 0.0-1.0</code>

For SMS and AMS2000:

Option	Description
-backendinfo <i>ctl_no</i> [<i>path_no.loop_no</i> ...]	When outputting statistical information on the back-end performance, specify the path number and loop number punctuating them with a period. <i>ctl_no</i> : Controller number (0, 1) When doing that, enter the path number and loop number using numerals or hyphen(s) (-). If the specification of path number and loop number is omitted, the information about all the back-end is output. Single or multiple path numbers and loop numbers can be specified. Single specification : Specifying a single path number and loop number. Example: -backendinfo 0 0.0 Multiple specification: Specifying multiple path numbers and loop numbers. Example: -backendinfo 0 0.0 1.0 -backendinfo 0 0.0-1.0

The tag count and the total tag count output a same value. The average tag count and the total average tag count output the same value.

When the **-pfmstatics** option is present and the **-portinfo**, **-rginfo**, **-dppoolinfo**, **-luinfo**, **-cacheinfo**, **-processorinfo**, **-driveinfo**, **-driveoprinfo**, **-backendinfo**, **tapelibraryinfo**, and **-mngareaainfo** options are absent, all the information of port, logical unit, cache, RAID group, processor, drive, drive operation, back-end, tape library, management area are outputted. (For AMS, WMS, and SMS, defined RAID group and logical unit are outputted. For AMS2000, defined RAID group, DP pool and logical unit are outputted.)

For AMS2000:

Option	Description
-dppoolinfo <i>ctl_no</i> [<i>pool_no ...</i>]	When outputting performance statistics information of DP pool,specify the DP pool number to be output. When doing that, enter the DP pool number using numerals or hyphen(s) (-).If the specification of DP pool number is omitted, the information about all defined DP pool is output. Single or multiple DP pool numbers can be specified. Single specification : Specifying a single DP pool number. Example: -dppoolinfo 3 Multiple specification: Specifying multiple DP pool numbers. Example: -dppoolinfo 0 1 2 3 4 5 8 -dppoolinfo 0-5 8

When the -pfmstatics option is present and the -portinfo, -rginfo, -dppoolinfo, -luinfo, -cacheinfo, -processorinfo, -driveinfo, -driveoprinfo, and -backendinfo options are absent, all the information of port, logical unit, cache, RAID group, processor, drive, drive operation, back-end is outputted. (For AMS, WMS and SMS, defined RAID group and logical unit are outputted. For AMS2000, defined RAID group, DP pool and logical unit are outputted.)

If the information cannot be acquired in the interval time by the -auto specification, the “skipped” string displays for the file acquired with the timestamp and the file which could not be acquired in the interval time.

No. 1

2012/11/20 13:01:00 skipped - SN: 93000001

If a communication error has occurred by the -neterrorskip option, an error message “error skipped” displays with the timestamp and file acquired.

No. 1

2012/11/20 13:01:00 skipped - SN: 93000001

error message

Example

The following example acquires the performance information of an array ams500a1 only once at an interval of 10 minutes.

```
% auperform -unit ams500a1 -auto 10 -count 1 -pfmstatics
Day yy mm hh:mm:ss yyyy Start
Day yy mm hh:mm:ss yyyy Output File Name : pfm00000.txt Output Count : 1/1Turn..
```

The performance statistics information file(s) have been outputted successfully.
%

```

No. 1 ← Output number
2002/08/20 13:47:33 - 2002/08/20 13:48:33 ← Information getting time

LU CTL      Read CMD Count  Read CMD Hit Count  Rate  Write CMD Count  Write CMD Hit Count  Rate
0 0          0              0          0      0              0          0
1 0          0              0          0      0              0          0
2 0          0              0          0      0              0          0
:
:
509 0        0              0          0      0              0          0
510 0        0              0          0      0              0          0
511 0        0              0          0      0              0          0
TOTAL 0      0              0          0      0              0          0
LU CTL      Read CMD Count  Read CMD Hit Count  Rate  Write CMD Count  Write CMD Hit Count  Rate
0 1          0              0          0      0              0          0
1 1          0              0          0      0              0          0
2 1          0              0          0      0              0          0
:
:
509 1        0              0          0      0              0          0
510 1        0              0          0      0              0          0
511 1        0              0          0      0              0          0
TOTAL 1      0              0          0      0              0          0

```

- **No.:** Output number
- **Information getting time:** Time and date information is obtained
- **LU:** Logical unit number
- **CTL:** Controller number
- **Read CMD Count:** Number of received Read commands
- **Read CMD Hit Count:** Number of cache-hit Read commands to received Read commands
- **Rate:** Rate (%) of cache-hit Read commands to received Read commands
- **Write CMD Count:** Number of received Write commands
- **Write CMD Hit Count:** Number of cache-hit Write commands to received Write commands
- **Rate:** Rate (%) of cache-hit Write commands to received Write commands
- **Total:** Entire controller

```

Hitachi number
2011/01/20 11:00:38 ~ 2011/01/20 11:01:39 - 9625012345
---- Port Information ----
CTL Port 10 Rate(10PS) Read Rate(10PS) Write Rate(10PS) Read Hit(%) Write Hit(%) Trans. Rate(MB/S) Read Trans. Rate(MB/S) Write Trans. Rate(MB/S)
0 A 167 167 4081 2 0 0 25 25
0 B 7905 6951 1254 0 0 0 0 0
CTL Port Read OMD Count Write OMD Count Read OMD Hit Count Write OMD Hit Count Read Trans. Size(MB) Write Trans. Size(MB)
0 A 10640 25330 8028 971 1435 971 1511
0 B 26100 91240 232 204 204 204
CTL Port CTL OMD Count CTL OMD Trans. Size(MB) CTL OMD Time(Seconds) CTL OMD Max Time(Seconds)
0 A 0 0 0 0 0
0 B 0 0 0 0 0
CTL Port Data OMD 10 Rate(10PS) Data OMD Trans. Rate(MB/S) Data OMD Count Data OMD Trans. Size(MB) Data OMD Time(Seconds) Data OMD Max Time(Seconds)
0 A 0 0 0 0 0
0 B 0 0 0 0 0
CTL Port Timeout Error Count
0 A 0
0 B 0
CTL Port Random 10 Rate(10PS) Random Read Rate(10PS) Random Write Rate(10PS) Random Trans. Rate(MB/S) Random Read Trans. Rate(MB/S) Random Write Trans. Rate(MB/S)
0 A 117514 84176 20144 24 24 10 23
0 B 117514 84176 20144 24 24 10 23
CTL Port Random Read OMD Count Random Write OMD Count Random Read Trans. Size(MB) Random Write Trans. Size(MB)
0 A 555405 709540 1453 1453
0 B 555405 709540 1453 1453
CTL Port Sequential 10 Rate(10PS) Sequential Read Rate(10PS) Sequential Write Rate(10PS) Sequential Trans. Rate(MB/S) Sequential Read Trans. Rate(MB/S) Sequential Write Trans. Rate(MB/S)
0 A 51772 4020 1202 84 84
0 B 51772 4020 1202 84 84
CTL Port Sequential Read OMD Count Sequential Write OMD Count Sequential Read Trans. Size(MB) Sequential Write Trans. Size(MB)
0 A 241200 121381 1779 1779
0 B 241200 121381 1779 1779
CTL Port XCOPY Rate(10PS) XCOPY Read Rate(10PS) XCOPY Write Rate(10PS) XCOPY Read Trans. Rate(MB/S) XCOPY Write Trans. Rate(MB/S)
0 A 412950 208747 18575 162 162
0 B 412950 208747 18575 162 162
CTL Port XCOPY Time(Seconds) XCOPY Max Time(Seconds)
0 A 0 5144400
0 B 0 13701000
---- RG Information ----
CTL RG 10 Rate(10PS) Read Rate(10PS) Write Rate(10PS) Read Hit(%) Write Hit(%) Trans. Rate(MB/S) Read Trans. Rate(MB/S) Write Trans. Rate(MB/S)
0 A 31511 42361 4881 2 2 34 38
0 B 31511 42361 4881 2 2 34 38
CTL RG Read OMD Count Write OMD Count Read OMD Hit Count Write OMD Hit Count Read Trans. Size(MB) Write Trans. Size(MB)
0 A 107340 237300 1804 1794 1794 1794
0 B 107340 237300 1804 1794 1794 1794
CTL RG Random 10 Rate(10PS) Random Read Rate(10PS) Random Write Rate(10PS) Random Trans. Rate(MB/S) Random Read Trans. Rate(MB/S) Random Write Trans. Rate(MB/S)
0 A 664121 664121 517 517
0 B 664121 664121 517 517
CTL RG Random Read OMD Count Random Write OMD Count Random Read Trans. Size(MB) Random Write Trans. Size(MB)
0 A 301750 353949 593 593
0 B 301750 353949 593 593
CTL RG Sequential 10 Rate(10PS) Sequential Read Rate(10PS) Sequential Write Rate(10PS) Sequential Trans. Rate(MB/S) Sequential Read Trans. Rate(MB/S) Sequential Write Trans. Rate(MB/S)
0 A 119447 50007 495 495
0 B 119447 50007 495 495
CTL RG Sequential Read OMD Count Sequential Write OMD Count Sequential Read Trans. Size(MB) Sequential Write Trans. Size(MB)
0 A 1231180 4818 7244 7244
0 B 1231180 4818 7244 7244
CTL RG XCOPY Rate(10PS) XCOPY Read Rate(10PS) XCOPY Write Rate(10PS) XCOPY Read Trans. Rate(MB/S) XCOPY Write Trans. Rate(MB/S)
0 A 1745541 1076431 630 630
0 B 1745541 1076431 630 630
CTL RG XCOPY Time(Seconds) XCOPY Max Time(Seconds)
0 A 0 2859400
0 B 0 2859400
---- DP Pool Information ----
CTL DP Pool 10 Rate(10PS) Read Rate(10PS) Write Rate(10PS) Read Hit(%) Write Hit(%) Trans. Rate(MB/S) Read Trans. Rate(MB/S) Write Trans. Rate(MB/S)
0 A 1969 8106 5090 0 1 35 0
0 B 1969 8106 5090 0 1 35 0
CTL DP Pool Read OMD Count Write OMD Count Read OMD Hit Count Write OMD Hit Count Read Trans. Size(MB) Write Trans. Size(MB)
0 A 43160 26530 152 201 0 0
0 B 43160 26530 152 201 0 0
CTL DP Pool XCOPY Rate(10PS) XCOPY Read Rate(10PS) XCOPY Write Rate(10PS) XCOPY Read Trans. Rate(MB/S) XCOPY Write Trans. Rate(MB/S)
0 A 15815 3033 11368 27 39
0 B 15815 3033 11368 27 39
CTL DP Pool XCOPY Time(Seconds) XCOPY Max Time(Seconds)
0 A 0 14892600
0 B 0 14892600
---- LU Information ----
CTL LU 10 Rate(10PS) Read Rate(10PS) Write Rate(10PS) Read Hit(%) Write Hit(%) Trans. Rate(MB/S) Read Trans. Rate(MB/S) Write Trans. Rate(MB/S)
0 A 14467 10595 5381 0 0 14 21
0 B 14467 10595 5381 0 0 14 21
CTL LU Read OMD Count Write OMD Count Read OMD Hit Count Write OMD Hit Count Read Trans. Size(MB) Write Trans. Size(MB)
0 A 214720 300440 1173 1173
0 B 214720 300440 1173 1173
CTL LU Read OMD Hit Count Write OMD Hit Count Read OMD Hit Max Time(Seconds) Write OMD Hit Max Time(Seconds)
0 A 202590001 217624191877716 180 180
0 B 202590001 217624191877716 180 180
CTL LU Write OMD Hit Count Write OMD Hit Count Write OMD Hit Max Time(Seconds) Write OMD Hit Max Time(Seconds)
0 A 42400 42386881728 254897495764959 254897495764959
0 B 42400 42386881728 254897495764959 254897495764959
CTL LU Read OMD Miss Count Read OMD Miss Time(Seconds) Read OMD Miss Max Time(Seconds)
0 A 340600 125275640 25255832321071 25255832321071
0 B 340600 125275640 25255832321071 25255832321071
CTL LU Write OMD Miss Count Write OMD Miss Time(Seconds) Write OMD Miss Max Time(Seconds)
0 A 84180 150067800 21763832321071 21763832321071
0 B 84180 150067800 21763832321071 21763832321071
CTL LU Read OMD Job Count Read OMD Job Time(Seconds) Read OMD Job Max Time(Seconds)
0 A 152800 1474860394 217113683144234 217113683144234
0 B 152800 1474860394 217113683144234 217113683144234
CTL LU Write OMD Job Count Write OMD Job Time(Seconds) Write OMD Job Max Time(Seconds)
0 A 2543640 847064222 21754882548114749 21754882548114749
0 B 2543640 847064222 21754882548114749 21754882548114749
CTL LU Read Hit Delay OMD Count(100ms) Read Hit Delay OMD Count(300-499ms) Read Hit Delay OMD Count(500-999ms) Read Hit Delay OMD Count(1000ms-)
0 A 107450 3981800 0 0
0 B 107450 3981800 0 0
CTL LU Write Hit Delay OMD Count(100ms) Write Hit Delay OMD Count(300-499ms) Write Hit Delay OMD Count(500-999ms) Write Hit Delay OMD Count(1000ms-)
0 A 24720 3025 2691
0 B 24720 3025 2691
CTL LU Read Miss Delay OMD Count(100ms) Read Miss Delay OMD Count(300-499ms) Read Miss Delay OMD Count(500-999ms) Read Miss Delay OMD Count(1000ms-)
0 A 418780 269520 27000
0 B 418780 269520 27000
CTL LU Write Miss Delay OMD Count(100ms) Write Miss Delay OMD Count(300-499ms) Write Miss Delay OMD Count(500-999ms) Write Miss Delay OMD Count(1000ms-)
0 A 30080 123402 0
0 B 30080 123402 0
CTL LU Read Job Delay OMD Count(100ms) Read Job Delay OMD Count(300-499ms) Read Job Delay OMD Count(500-999ms) Read Job Delay OMD Count(1000ms-)
0 A 220590 88100 0
0 B 220590 88100 0
CTL LU Write Job Delay OMD Count(100ms) Write Job Delay OMD Count(300-499ms) Write Job Delay OMD Count(500-999ms) Write Job Delay OMD Count(1000ms-)
0 A 18280 35820 6380 138
0 B 18280 35820 6380 138
CTL LU Tax Count Average Tax Count
0 A 257 0
0 B 257 0
CTL LU Data OMD 10 Rate(10PS) Data OMD Trans. Rate(MB/S) Data OMD Count Data OMD Trans. Size(MB) Data OMD Time(Seconds) Data OMD Max Time(Seconds)
0 A 2572 20238 82 82
0 B 2572 20238 82 82
CTL LU Random 10 Rate(10PS) Random Read Rate(10PS) Random Write Rate(10PS) Random Trans. Rate(MB/S) Random Read Trans. Rate(MB/S) Random Write Trans. Rate(MB/S)
0 A 18092 7552 4729 59 38 21
0 B 18092 7552 4729 59 38 21
CTL LU Random Read OMD Count Random Write OMD Count Random Read Trans. Size(MB) Random Write Trans. Size(MB)
0 A 441065 283780 228 1285
0 B 441065 283780 228 1285
CTL LU Sequential 10 Rate(10PS) Sequential Read Rate(10PS) Sequential Write Rate(10PS) Sequential Trans. Rate(MB/S) Sequential Read Trans. Rate(MB/S) Sequential Write Trans. Rate(MB/S)
0 A 42080 10010 173 173
0 B 42080 10010 173 173
CTL LU Sequential Read OMD Count Sequential Write OMD Count Sequential Read Trans. Size(MB) Sequential Write Trans. Size(MB)
0 A 100100 30540 1230 1230
0 B 100100 30540 1230 1230
CTL LU XCOPY Rate(10PS) XCOPY Read Rate(10PS) XCOPY Write Rate(10PS) XCOPY Read Trans. Rate(MB/S) XCOPY Write Trans. Rate(MB/S)
0 A 4744 22143 107 104
0 B 4744 22143 107 104
CTL LU XCOPY Time(Seconds) XCOPY Max Time(Seconds)
0 A 0 5424400
0 B 0 5424400
CTL LU Total Tax Count Read Tax Count Write Tax Count Average Total Tax Count Average Read Tax Count Average Write Tax Count
0 A 257 -1 -1 0 0 0
0 B 257 -1 -1 0 0 0

```

«Generally, when the array is structured so that the load on each controller and the load on each disk are leveled, its performance is improved. The higher the cache hit rate, the higher the performance becomes.

```
--- Cache Information ---
TL Write Pending Rate(%)
0 0
TL Clean Queue Usage Rate(%) Middle Queue Usage Rate(%) Physical Queue Usage Rate(%) Total Queue Usage Rate(%)
0 0 0 0
TL Partition Write Pending Rate(%)
0 0 0
0 1 0
0 2 0
:
:
0 31 0
TL Partition Clean Queue Usage Rate(%) Middle Queue Usage Rate(%) Physical Queue Usage Rate(%)
0 0 0 0
0 1 0 0
0 2 0 0
:
:
0 31 0 0

--- Processor Information ---
TL Core Usage(%)
0 X 0
TL Host-Cache Bus Usage Rate(%) Drive-Cache Bus Usage Rate(%) Processor-Cache Bus Usage Rate(%)
0 0 0
TL Cache(DRR) Bus Usage Rate(%) Dual Bus Usage Rate(%) Total Bus Usage Rate(%)
0 0 0

--- Drive Information ---
TL Unit HDU IO Rate(IOPS) Read Rate(IOPS) Write Rate(IOPS) Trans. Rate(MB/S) Read Trans. Rate(MB/S) Write Trans. Rate(MB/S) Online Verify Rate(IOPS)
0 0 0 4147 2043 2104 54 30 23 100
0 0 1 8506 4081 4415 46 33 13 3
0 0 2 13761 10452 3309 74 52 22 50
: 34
: 75
: .

TL Unit HDU Read CMD Count Write CMD Count Read Trans. Size Write Trans. Size Online Verify CMD Count
0 0 0 122580 126290 1834 1411 6042
0 0 1 245500 264910 1995 804 192
0 0 2 627120 198560 3120 1348 3038
:
:

--- Drive Operate Information ---
TL Unit HDU Operating Rate(%) Tag Count Unload Time(min.) Average Tag Count
0 0 0 0 0 0 0
0 0 1 0 0 0 0
0 0 2 0 0 0 0
:
:

--- Backend Information ---
TL Path IO Rate(IOPS) Read Rate(IOPS) Write Rate(IOPS) Trans. Rate(MB/S) Read Trans. Rate(MB/S) Write Trans. Rate(MB/S) Online Verify Rate(IOPS)
0 0 0 0 0 0 0
0 1 0 0 0 0 0
TL Path Read CMD Count Write CMD Count Read Trans. Size Write Trans. Size Online Verify CMD Count
0 0 0 0 0 0 0
0 1 0 0 0 0 0
```

```

No. 1 ← Output number
2008/09/17 13:48:09 - 2008/09/17 13:49:00 ← Information getting time
---- Port Information ----
CTL Port IO Rate(IOPS) Read Rate(IOPS) Write Rate(IOPS) Read Hit(%) Write Hit(%) Trans. Rate(MB/S) Read Trans. Rate(MB/S) Write Trans. Rate(MB/S)
0 A 9540 4236 5903 0 0 26 25 0
0 B 8960 3014 5545 3 0 34 23 11
0 C 5341 529 2911 20 1 43 19 24
0 D 12059 10266 1772 0 3 23 6 17
CTL Port Read CMD Count Write CMD Count Read CMD Hit Count Write CMD Hit Count Read Trans. Size(MB) Write Trans. Size(MB)
0 A 24960 21296 542 1529 18
0 B 17780 32719 544 128 1365 652
0 C 31220 16500 6243 1161 1433
0 D 695740 104060 2457 371 1520
CTL Port CTL CMD IO Rate(IOPS) CTL CMD Trans. Rate(MB/S) CTL CMD Count CTL CMD Trans. Size(MB) CTL CMD Time(microsec.) CTL CMD Max Time(microsec.)
0 A 4236 0 24960 0 0 0
0 B 3014 0 417580 0 0 44175353402240
0 C 529 0 544189 0 338948586912 0
0 D 529 0 31220 0 6 1520
CTL Port Data CMD IO Rate(IOPS) Data CMD Trans. Rate(MB/S) Data CMD Count Data CMD Trans. Size(MB) Data CMD Time(microsec.) Data CMD Max Time(microsec.)
0 A 529 0 31220 0 0 0
0 B 3014 0 17780 0 2 0
0 C 6119 0 372340 0 0 0
0 D 10681 0 62400 0 29547884148180 0
CTL Port Timeout Error Count
0 A 0
0 B 0
0 C 0
0 D 0
---- RG Information ----
CTL RG IO Rate(IOPS) Read Rate(IOPS) Write Rate(IOPS) Read Hit(%) Write Hit(%) Trans. Rate(MB/S) Read Trans. Rate(MB/S) Write Trans. Rate(MB/S)
0 0 13820 10710 2201 1 3 145 75 67
0 1 23286 17990 5272 0 1 83 40 42
0 2 15157 13797 1360 1 6 108 44 63
:
:
CTL RG Read CMD Count Write CMD Count Read CMD Hit Count Write CMD Hit Count Read Trans. Size(MB) Write Trans. Size(MB)
0 0 63440 17170 592 4 1 32 4 28
0 1 1061620 311080 3531 4518 2408 2497
0 2 814060 80240 5116 4668 2650 3761
:
:
---- LU Information ----
CTL LU IO Rate(IOPS) Read Rate(IOPS) Write Rate(IOPS) Read Hit(%) Write Hit(%) Trans. Rate(MB/S) Read Trans. Rate(MB/S) Write Trans. Rate(MB/S)
0 0 174 3026 4 1 32 4 28
0 1 8856 9427 225 1 12 23 7 26
CTL LU Read CMD Count Write CMD Count Read CMD Hit Count Write CMD Hit Count Read Trans. Size(MB) Write Trans. Size(MB)
0 0 10440 101570 419 1689 283 1594
0 1 56680 13770 5376 1579 427 1570
CTL LU Read CMD Hit Count2 Read CMD Hit Time(microsec.) Read CMD Hit Max Time(microsec.)
0 0 0 0 21708370719803377
0 1 390950 0 217028518514230019
CTL LU Write CMD Hit Count2 Write CMD Hit Time(microsec.) Write CMD Hit Max Time(microsec.)
0 0 0 0 94842224684996743
0 1 514620 22194728229 94842224684996743
CTL LU Read CMD Miss Count Read CMD Miss Time(microsec.) Read CMD Miss Max Time(microsec.)
0 0 341350 0 16636239375763479
0 1 0 0 1662823011898358687
CTL LU Write CMD Miss Count Write CMD Miss Time(microsec.) Write CMD Miss Max Time(microsec.)
0 0 62740 0 2387225703956530209
0 1 0 0 2387225703956530209
CTL LU Read CMD Job Count Read CMD Job Time(microsec.) Read CMD Job Max Time(microsec.)
0 0 0 0 311068443158305860
0 1 288500 0 211062745203729639
CTL LU Write CMD Job Count Write CMD Job Time(microsec.) Write CMD Job Max Time(microsec.)
0 0 0 0 3834028168418803689
0 1 268220 72213744205 3834028168418803689
CTL LU Read Hit Delay CMD Count(300ms) Read Hit Delay CMD Count(300-499ms) Read Hit Delay CMD Count(500-999ms) Read Hit Delay CMD Count(1000ms-)
0 0 3799000 0 4152400 0
0 1 0 0 0 0
CTL LU Write Hit Delay CMD Count(300ms) Write Hit Delay CMD Count(300-499ms) Write Hit Delay CMD Count(500-999ms) Write Hit Delay CMD Count(1000ms-)
0 0 165040 0 90770 2616 1401
0 1 0 0 0 0
CTL LU Read Miss Delay CMD Count(300ms) Read Miss Delay CMD Count(300-499ms) Read Miss Delay CMD Count(500-999ms) Read Miss Delay CMD Count(1000ms-)
0 0 0 0 0 0
0 1 2513250 0 3180000 0
CTL LU Write Miss Delay CMD Count(300ms) Write Miss Delay CMD Count(300-499ms) Write Miss Delay CMD Count(500-999ms) Write Miss Delay CMD Count(1000ms-)
0 0 0 0 0 0
0 1 513100 89680 5084 3119
CTL LU Read Job Delay CMD Count(300ms) Read Job Delay CMD Count(300-499ms) Read Job Delay CMD Count(500-999ms) Read Job Delay CMD Count(1000ms-)
0 0 3983700 0 3985000 0
0 1 0 0 0 0
CTL LU Write Job Delay CMD Count(300ms) Write Job Delay CMD Count(300-499ms) Write Job Delay CMD Count(500-999ms) Write Job Delay CMD Count(1000ms-)
0 0 0 0 319180 2478 997
0 1 0 0 0 0
CTL LU Tag Count Average Tag Count
0 0 257 0
0 1 614 0
CTL LU Data CMD IO Rate(IOPS) Data CMD Trans. Rate(MB/S) Data CMD Count Data CMD Trans. Size(MB) Data CMD Time(microsec.) Data CMD Max Time(microsec.)
0 0 0 0 0 0 0 0
0 1 0 0 0 0 0 0

```

- **No.:** Output number
- **Information getting time:** Time and date information is acquired
- **CTL:** Controller number
- **Port:** Port number
- **IO Rate (IOPS):** Number of Read/Write commands received per second
- **Read Rate (IOPS):** Number of Read commands received per second
- **Write Rate (IOPS):** Number of Write commands received per second
- **Read Hit (%)**: Rate of the number of the Read commands, which could cache-hitting, out of the Read commands received in the specified period

- **Write Hit (%)**: Rate of the number of the Write commands, which could write data immediately to the cache, out of the Write commands received in the specified period
- **Trans. Rate (MB/S)**: Transfer size of Read/Write commands per second
- **Read Trans. Rate (MB/S)**: Transfer size of Read commands per second
- **Write Trans. Rate (MB/S)**: Transfer size of Write commands per second
- **Read CMD Count**: Received number of Read commands
- **Write CMD Count**: Received number of Write command
- **Read CMD Hit Count**: Number of the Read commands that had been cache-hit
- **Write CMD Hit Count**: Number of the Write commands, which could write data immediately to the cache
- **Read Trans. Size (MB)**: Transfer size of Read commands
- **Write Trans. Size (MB)**: Transfer size of Write commands
- **CTL CMD IO Rate (IOPS)**: Received number of Initiator Control commands per second (acquired local side only)
- **CTL CMD Trans. Rate (KB/S)**: Transfer size of Initiator Control commands per second (acquired local side only)
- **CTL CMD Count**: Number of Initiator Control commands (acquired local side only)
- **CTL CMD Trans. Size (KB)**: Transfer size of Initiator Control commands (acquired local side only)
- **CTL CMD Time (microsec.)**: Response time of Initiator Control commands
- **CTL CMD Max Time (microsec.)**: Max response time of Initiator Control commands
- **Data CMD IO Rate (IOPS)**: Received number of Initiator Data commands per second (acquired local side only)
- **Data CMD Trans. Rate (MB/S)**: Transfer size of Initiator Data commands per second (acquired local side only)
- **Data CMD Count**: Number of Initiator Data commands (acquired local side only)
- **Data CMD Trans. Size (MB)**: Transfer size of Initiator Data commands (acquired local side only)
- **Data CMD Time (microsec.)**: Response time of Initiator Data commands
- **Data CMD Max Time (microsec.)**: Max response time of Initiator Data commands
- **Timeout Error Count**: Timeout error count

- **Random IO Rate (IOPS):** Received number of Random Read/Write commands per second
- **Random Read Rate (IOPS):** Received number of Random Read commands per second
- **Random Write Rate (IOPS):** Received number of Random Write commands per second
- **Random Trans. Rate (MB/S):** Transfer size of Random Read/Write commands per second
- **Random Read Trans. Rate (MB/S):** Transfer size of Random Read commands per second
- **Random Write Trans. Rate (MB/S):** Transfer size of Random Write commands per second
- **Random Read CMD Count:** Received number of Random Read commands
- **Random Write CMD Count:** Received number of Random Write commands
- **Random Read Trans. Size (MB):** Transfer size of Random Read commands
- **Random Write Trans. Size (MB):** Transfer size of Random Write commands
- **Sequential IO Rate (IOPS):** Received number of Sequential Read/Write commands per second
- **Sequential Read Rate (IOPS):** Received number of Sequential Read commands per second
- **Sequential Write Rate (IOPS):** Received number of Sequential Write commands per second
- **Sequential Trans. Rate (MB/S):** Transfer size of Sequential Read/Write commands per second
- **Sequential Read Trans. Rate (MB/S):** Transfer size of Sequential Read commands per second
- **Sequential Write Trans. Rate (MB/S):** Transfer size of Sequential Write commands per second
- **Sequential Read CMD Count:** Received number of Sequential Read commands
- **Sequential Write CMD Count:** Received number of Sequential Write commands
- **Sequential Read Trans. Size (MB):** Transfer size of Sequential Read commands
- **Sequential Write Trans. Size (MB):** Transfer size of Sequential Write commands
- **XCOPY Rate (IOPS):** Received number of XCOPY commands per second

- **XCOPY Read Rate (IOPS):** Received number of XCOPY Read commands per second
- **XCOPY Write Rate (IOPS):** Received number of XCOPY Write commands per second
- **XCOPY Read Trans. Rate (MB/S):** Transfer size of XCOPY Read commands per second
- **XCOPY Write Trans. Rate (MB/S):** Transfer size of XCOPY Write commands per second
- **XCOPY Time (microsec.):** Response time of XCOPY commands
- **XCOPY Max Time (microsec.):** Max response time of XCOPY commands
- **RG:** RAID group number
- **LU:** Logical unit number
- **Read CMD Hit Count2:** Number of the Hit Read Special Path commands out of the read commands that made cache hits
- **Read CMD Hit Time(microsec.):** The average response time of the Hit Read Special Path command
- **Read CMD Hit Max Time(microsec.):** The maximum response time of the Hit Read Special Path command
- **Write CMD Hit Count2:** Number of the Write Special Path commands out of the Write commands, which could write data immediately to the cache
- **Write CMD Hit Time(microsec.):** The average response time of the Write Special Path command
- **Write CMD Hit Max Time(microsec.):** The maximum response time of the Write Special Path command
- **Read CMD Miss Count:** The number of the Miss Read Special Path commands out of the Read commands that made no cache hits
- **Read CMD Miss Time(microsec.):** The average response time of the Miss Read Special Path command
- **Read CMD Miss Max Time(microsec.):** The maximum response time of the Miss Read Special Path command
- **Write CMD Miss Count:** The number of the Random Write Special Path commands that could complete the high-speed process up to the parity generation that is an extended process of the Write command
- **Write CMD Miss Time(microsec.):** The average response time of the Random Write Special Path command
- **Write CMD Miss Max Time(microsec.):** The maximum response time of the Random Write Special Path command

- **Read CMD Job Count:** The number of the Read commands that could not perform the high-speed process
- **Read CMD Job Time(microsec.):** The average response time of the Read command job
- **Read CMD Job Max Time(microsec.):** The maximum response time of the Read command job
- **XCOPY Read Trans. Rate (MB/S):** Transfer size of XCOPY Read commands per second.
- **XCOPY Write Trans. Rate (MB/S):** Transfer size of XCOPY Write commands per second.
- **XCOPY time (microsec.):** Response time of XCOPY commands.
- **XCOPY Max Time (microsec.):** Max response time of XCOPY commands.
- **Write CMD Job Count:** The number of the Write commands that could not perform the high-speed process
- **Write CMD Job Time(microsec.):** The average response time of the Write command job
- **Write CMD Job Max Time(microsec.):** The maximum response time of the Write command job
- **Read Hit Delay CMD Count(<300ms):** The number of commands, whose response time is less than 300 ms, out of the Hit Read Special Path commands
- **Read Hit Delay CMD Count(300-499ms):** The number of commands, whose response time is in a range of 300 ms to 499 ms, out of the Hit Read Special Path commands
- **Read Hit Delay CMD Count(500-999ms):** The number of commands, whose response time is in a range of 500 ms to 999 ms, out of the Hit Read Special Path commands
- **Read Hit Delay CMD Count(1000ms-):** The number of commands, whose response time is 1000 ms or more, out of the Hit Read Special Path commands
- **Write Hit Delay CMD Count(<300ms):** The number of commands, whose response time is less than 300 ms, out of the Write Special Path commands
- **Write Hit Delay CMD Count(300-499ms):** The number of commands, whose response time is in a range of 300 ms to 499 ms, out of the Write Special Path commands
- **Write Hit Delay CMD Count(500-999ms):** The number of commands, whose response time is in a range of 500 ms to 999 ms, out of the Write Special Path commands
- **Write Hit Delay CMD Count(1000ms-):** The number of commands, whose response time is 1000 ms or more, out of the Write Special Path commands

- **Read Miss Delay CMD Count(<300ms):** The number of commands, whose response time is less than 300 ms, out of the Miss Read Special Path commands
- **Read Miss Delay CMD Count(300-499ms):** The number of commands, whose response time is in a range of 300 ms to 499 ms, out of the Miss Read Special Path commands
- **Read Miss Delay CMD Count(500-999ms):** The number of commands, whose response time is in a range of 500 ms to 999 ms, out of the Miss Read Special Path commands
- **Read Miss Delay CMD Count(1000ms-):** The number of commands, whose response time is 1000 ms or more, out of the Miss Read Special Path commands
- **Write Miss Delay CMD Count(<300ms):** The number of commands, whose response time is less than 300 ms, out of the Random Write Special Path commands
- **Write Miss Delay CMD Count(300-499ms):** The number of commands, whose response time is in a range of 300 ms to 499 ms, out of the Random Write Special Path commands
- **Write Miss Delay CMD Count(500-999ms):** The number of commands, whose response time is in a range of 500 ms to 999 ms, out of the Random Write Special Path commands
- **Write Miss Delay CMD Count(1000ms-):** The number of commands, whose response time is 1000 ms or more, out of the Random Write Special Path commands
- **Read Job Delay CMD Count(<300ms):** The number of commands, whose response time is less than 300 ms, out of the Read command job
- **Read Job Delay CMD Count(300-499ms):** The number of commands, whose response time is in a range of 300 ms to 499 ms, out of the Read command job
- **Read Job Delay CMD Count(500-999ms):** The number of commands, whose response time is in a range of 500 ms to 999 ms, out of the Read command job
- **Read Job Delay CMD Count(1000ms-):** The number of commands, whose response time is 1000 ms or more, out of the Read command job
- **Write Job Delay CMD Count(<300ms):** The number of commands, whose response time is less than 300 ms, out of the Write command job
- **Write Job Delay CMD Count(300-499ms):** The number of commands, whose response time is in a range of 300 ms to 499 ms, out of the Write command job

- **Write Job Delay CMD Count(500-999ms):** The number of commands, whose response time is in a range of 500 ms to 999 ms, out of the Write command job
- **Write Job Delay CMD Count(1000ms-):** The number of commands, whose response time is 1000 ms or more, out of the Write command job
- **Total Tag Count:** Total tag count
- **Read Tag Count:** Read tag count
- **Write Tag Count:** Write tag count
- **Average Total Tag Count:** Average total tag count
- **Average Read Tag Count:** Average read tag count
- **Average Write Tag Count:** Average write tag count
- **Tag Count:** The maximum number of tags in the specified period
- **Cache Write Pending Rate (%):** Rate of cache usage capacity (middle+physical) within the cache capacity
- **Cache Clean Queue Usage Rate (%):** Rate of clean cache usage
- **Cache Middle Queue Usage Rate (%):** Rate of middle cache usage
- **Cache Physical Queue Usage Rate (%):** Rate of physical cache usage
- **Cache Total Queue Usage Rate (%):** Rate of total cache usage
- **Partition:** Partition number
- **Usage (%):** Operation rate of the processor
- **Host-Cache Bus Usage Rate (%):** The use rate of the bus between the host and the cache
- **Drive-Cache Bus Usage Rate (%):** The use rate of the bus between the drive and the cache
- **Processor-Cache Bus Usage Rate (%):** The use rate of the bus between the processor and the cache
- **Cache (DRR) Bus Usage Rate (%):** The use rate of the bus between the parity generation circuit (DRR) and the cache
- **Dual Bus Usage Rate (%):** The use rate of the bus between the controllers
- **Total Bus Usage Rate (%):** The total use rate of the cache bus
- **Unit:** Unit number
- **HDU:** HDU number

- **Online Verify. Rate (IOPS):** Number of Online Verify commands per second
- **Online Verify CMD Count:** Number of Online Verify commands
- **Operating Rate (%):** Operation rate of the drive
- **Tag Count:** Number of Tag
- **Unload Time (min.):** Unload time of the drive
- **Path:** Path number
- **Cache Hit Rate (%):** Rate of cache-hitting within the management area
- **Access Count:** Access count of the management area

When the Tape replication option is attached, the following information is outputted.

- TG: Tape group number
- Total counts: Data prefetch counts or cache segment secured counts
- Miss counts: Data miss prefetch counts or cache segment miss secured counts
- Read Rate (MB/S): Received number of Read commands per second
- Write Rate (MB/S): Transfer size of Write commands per second
- LIB: Library number
- DRV: Tape drive number
- Read int (microsec.) AVE: Average time of Read commands
MAX: Maximum time of Read commands
MIN: Minimum time of Read commands
- Write int (microsec.) AVE: Average time of Write commands
MAX: Maximum time of Write commands
MIN: Minimum time of Write commands

High-speed process: There are two types of paths which execute the read/write command process: normal path and high-speed path. The high-speed process performs the command process in the high speed path.

Referencing/setting the collection state of performance statistics

Command name

aupfmstatiscfg

Format

```
9500V, AMS, WMS, SMS, AMS2000, HUS100
aupfmstatiscfg -unit unit_name -refer

9500V, AMS, WMS, SMS
aupfmstatiscfg -unit unit_name -set
[ -port          start | stop ]
[ -rglu          start | stop ]
[ -cache         start | stop ]
[ -processor     start | stop ]
[ -drive         start | stop ]
[ -driveopr      start | stop ]
[ -backend       start | stop ]

AMS2000
aupfmstatiscfg -unit unit_name -set
[ -port          start | stop ]
[ -rglu          start | stop ]
[ -cache         start | stop ]
[ -processor     start | stop ]
[ -drive         start | stop ]
[ -driveopr      start | stop ]
[ -backend       start | stop ]
[ -tapelibrary   start | stop ]

HUS100
aupfmstatiscfg -unit unit_name -set
[ -port          start | stop ]
[ -rglu          start | stop ]
[ -cache         start | stop ]
[ -processor     start | stop ]
[ -drive         start | stop ]
[ -driveopr      start | stop ]
[ -backend       start | stop ]
[ -managementarea start | stop ]
```

Description

This command refers to or sets the collection state of performance statistics information.

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of the array unit to which the collection state of performance statistics information is referred or set. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "(minus)", "_" (underline), "." (period), "@", or " (space)". Space in front and in the rear of the character string is removed.
-refer	Refers to the collection state of performance statistics information.
-set	Sets the collection state of performance statistics information.
-port start stop	Specify whether to start or stop collection of information for port. start: Starts collecting information for port. stop : Stops collecting information for port.
-rglu start stop	Specify whether to start or stop collection of information for RAID group and Logical Unit. start: Starts collecting information for RAID group and Logical Unit. stop : Stops collecting information for RAID group and Logical Unit.
-cache start stop	Specify whether to start or stop collection of information for cache. start: Starts collecting information for cache. stop : Stops collecting information for cache.
-processor start stop	Specify whether to start or stop collection of information for processor. start: Starts collecting information for processor. stop : Stops collecting information for processor.
-drive start stop	Specify whether to start or stop collection of information for drives. start: Starts collecting information for drives. stop : Stops collecting information for drives.
-driveopr start stop	Specify whether to start or stop collection of information for drive operatings. start: Starts collecting information for drive operatings. stop : Stops collecting information for drive operatings.

Option	Description
-backend start stop	Specify whether to start or stop collection of information for back-end. start: Starts collecting information for back-end. stop : Stops collecting information for back-end.

Examples

The following example displays the collection state of performance statistics information of an array 9500a1.

```
% aupfmstatiscfg -unit 9500a1 -refer
Password:
Port Information           : Stop
RAID Group/Logical Unit Information : Stop
Cache Information         : Stop
Processor Information      : Stop
Drive Information         : Stop
Drive Operating Information : Stop
Back-end Information      : Stop
%
```

The following example illustrates starting the capacity of cache and usage rate, then stopping it.

```
% aupfmstatiscfg -unit 9500a1 -set -cache start
Password:
When performance statistics is collected, access from the host is influenced.
Do you want to continue processing? (y/n [n]): y
The collection state of performance statistics information has been set success
fully.
%
% aupfmstatiscfg -unit 9500a1 -set -cache stop
Password:
The collection state of performance statistics information has been set success
fully.
%
```

The following example displays the collection state of performance statistics information for array unit hus110a1.

```
% aupfmstatiscfg -unit hus110a1 -refer
Port Information           : Start
RAID Group/DP Pool/Logical Unit Information : Start
Cache Information         : Start
Processor Information      : Start
Drive Information         : Start
Drive Operating Information : Start
Back-end Information      : Start
Management Area Information : Start
%
```

Downloading/updating firmware

Command name

aumicro

Format

```
9500V
aumicro -unit unit_name -read -fpath disk01

aumicro -unit unit_name -read -path disk01 disk02 disk03 ...
```

```

aumicro -revision

aumicro -unit unit_name -download -time time -check on | off

aumicro -unit unit_name -change -ctl0 | -ctl1

aumicro -clean

AMS, WMS
aumicro -unit unit_name -read -fpath micro_path

aumicro -unit unit_name -downloadrev

aumicro -revision

aumicro -unit unit_name -download -time time -check on | off

aumicro -unit unit_name -change -ctl0 | -ctl1

aumicro -clean

SMS, AMS2000, HUS100
aumicro -unit unit_name -auto -fpath micro_path
[ -time time ] [ -check on | off ] [ -cpuloadchk on
| off ]

aumicro -unit unit_name -read -fpath micro_path

aumicro -unit unit_name -downloadrev

aumicro -revision

aumicro -unit unit_name -download -time time -check on | off

aumicro -unit unit_name -change [ -cpuloadchk on | off ]

aumicro -clean

```

Description

This command downloads a firmware into the array. Additionally, it updates the current firmware with a downloaded firmware.

Options

Option	Description
-unit <i>unit_name</i>	Specify the name of an array unit whose firmware to download and update. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.
-read	Reads a firmware onto the Navigator.

Option	Description
<code>-path disk01 disk02 disk03 ...</code>	Specify sequentially the path names to individual directories in which each file of a firmware to be downloaded is stored.
<code>-fpath disk01</code>	Specify the path name of the directory which stored a disk 01 file of firmware to download.
<code>-fpath micro_path</code>	Specify the path name of the directory which stored a file of firmware to download.
<code>-revision</code>	Displays the revision of a firmware which has been read onto the Navigator.
<code>-download</code>	Downloads a firmware into an array unit.
<code>-time time</code>	Specify the time interval (0 to 60 seconds) at which to download a firmware. When the <code>-auto</code> option is specified: If the specification is omitted, the interval time is 3 seconds.
<code>-check on off</code>	Specify whether or not to check the revision of a firmware. When the <code>-auto</code> option is specified: If the specification is omitted, checking the revision.
<code>-downloadrev</code>	Displays the revision of a firmware which has been downloaded into an array unit.
<code>-change</code>	Updates a firmware.
<code>-ctl0 -ctl1</code>	Specify the controller whose firmware is to be updated.
<code>-clean</code>	Deletes the firmware which has been read onto the Navigator.
<code>-auto</code>	Reads, download and update a firmware.
<code>-cpuloadchk on off</code>	Specify whether to check the CPU loading or not. When the <code>-auto</code> or <code>-change</code> option is specified: If the specification is omitted, not checking the CPU loading.
Note: The time interval can be specified from 0 second, however, values over 3 seconds are recommended if execution is carried out while ON.	

Examples

The following example downloads the firmwares into an array 9500h and afterward performs the firmwares updating.

This example checks the revision of the firmwares of an array 9500h when downloading it.

```
% aurev -unit 9500h
Serial Number : 01234567
Firmware Revision : 1654
%
```

This example first reads in the firmwares to be downloaded. The firmwares are stored in several floppy disks or CD-R. This example shows that the contents of the floppy disk are stored in directories disk01, disk02, disk03, disk04, disk05, and disk06.

```
% aumicro -unit 9500h -read -fpath C:\Storage Navigator Modular 2 CLI\micro
\disk01
Password:
```

```
Are you sure you want to read the firmware?
(y/n [n]): y
Reading the file ended normally.
%
```

This example checks the revision of the read-in firmwares.

```
% aumicro -revision
Password:
New Revision : 1654
%
```

This example downloads the read-in firmwares into an array 9500h. It sets the time interval to 3 seconds, and specifies the checking of the firmwares revision. While downloading, the number of files that are already downloaded: *mmm*, and the total number of files to be downloaded: *nnn* are will be displayed.

```
% aumicro -unit 9500h -download -time 3 -check on
Password:
Are you sure you want to download the firmware to the subsystem?
(y/n [n]): y
When firmware update starts, the controller stops accepting any access from
the host until the update completes.
If you press the 'y' key, access from the host will be again possible right afte
r you press the return key on the message that will be displayed when update is
completed.
If you press the 'n' key, access from the host will be possible as soon as the f
irmware update completes and pressing the return key on the message will have no
action. (y/n [n]): n
9500h: mmm/nnn done.
The download has completed.
%
```



NOTE: When the AMS/WMS array is used connecting to the NAS, make sure the fail over of a NAS unit and stop NAS OS of the NAS unit connected to the controller for which a firmware is updated, before updating firmware.

If you update a firmware, during a period from an issue of a power down instruction to the completion of the power down when Power Saving, which is a priced option of the array, is used together, the power down may fail because the array receives a command from a host immediately after the array restarts. When the power down fails, execute the power down again. Check that the power down instruction has not been issued or has been completed (no RAID in the Power Saving Status of **Normal (Command Monitoring)** exists) before update a firmware.

This example updates the current firmwares with the downloaded firmwares. Updating takes place in the order of controller 0 and then controller 1.

```
% aumicro -unit 9500h -change -ctl0
Password:
It updates the firmware of Controller 0.
This process will cause controller to stop communicating with all attached Hosts
.
Are you sure? (y/n [n]): y
Now updating the firmware. Start Time MM:MM:SS Time Required 2 – 15min.
The access from the host will be accepted if you press the return key and if you
have pressed the option 'y' key on the message that was displayed in download.
If you have pressed the 'n' key on the message, the controller is already accept
ing accesses from host and pressing the return key will have no action.
The firmware is updated successfully.
%
% aumicro -unit 9500h -change -ctl1
Password:
```

```

It updates the firmware of Controller 1.
This process will cause controller to stop communicating with all attached Hosts
.
Are you sure? (y/n [n]): y
Now updating the firmware. Start Time MM:MM:SS Time Required 2 – 15min.
The access from the host will be accepted if you press the return key and if you
have pressed the option 'y' key on the message that was displayed in download.
If you have pressed the 'n' key on the message, the controller is already accept
ing accesses from host and pressing the return key will have no action.
The firmware is updated successfully.
%

```



NOTE: It may take time for an array to respond, depending on the condition of the array. If the array does not respond after 15 minutes or more, check the condition of the array. When downloading and updating the firmwares have completed, the read-in firmwares in Storage Navigator Modular 2 is be removed.

```

% aumicro -clean
Password:
Are you sure you want to delete the firmware?
(y/n [n]): y
%

```



NOTE: When the firmwares are updated, if the firmware of only one of the controllers is updated, the array is placed in a warning state. When the firmware of the other controller is updated, the array recovers from the warning state. When updating the firmwares, update the firmwares for both controllers. If the firmwares are read during the firmwares download, errors will occur during the download processing. When you read firmwares, perform after the download.

Examples of using commands

This section provides several examples of how to use the CLI commands.

The following is an example of how to configure RAID and set up a logical unit after connecting to a storage system.

The following is an example of how to set up a RAID and logical unit after connecting to an array.

1. Register an SMS100 array with a dual configuration by unit name SMS100. The connection interface is LAN connection for both controllers.

```

% auunitadd -unit SMS100 -LAN -ctl0 125.0.9.98 -ctl1 125.0.9.99
Unit SMS100 has been registered.
%

```

2. Check whether the registration has completed.

```

% auunitref
Name                                     Group
Type   Construction Connection Type Error Monitoring Communication Type IP Ad
dress/Host Name/Device Name
SMS100
SMS100 Dual      TCP/IP(LAN)  Enable      Non-secure    125.0.9.98 125.0.9.99
%

```

3. Check whether the RAID has been configured.

```
% aurgref -unit SMS100 -t
RAID RAID Parity
Group Level Groups Type Total Capacity Free Capacity Priority Status Reconstruction
Progress
0 6 (9D+2P 1 SAS 1.3 TB 1.3 TB (100%)RAID Group Expansion
Normal N/A

%
```

4. Add LU 100 (size 1 GB).

```
% auluadd -unit SMS100 -lu 100 -rg 0 -size 1g
Are you sure you want to set the logical unit? (y/n [n]): y
The logical unit has been set successfully.
The format was started.

%
```

5. Check whether the logical unit has been configured.

```
% auluref -unit SMS100 -g
LU Capacity Stripe RAID DP RAID
100 1.0 GB Size Group Pool Level Type Status
256KB 0 N/A 6(9D+2P) SAS Normal

%
```

CLI Commands for Local Replication

This section covers the following commands related to local replication parameters:

- [Display pair and pool information on page 3-352](#)
- [Display volumes available for use in pairs on page 3-355](#)
- [Display or define the SnapShot volume \(V-VOL\) on page 3-356](#)
- [Display or set up the data pool on page 3-358](#)
- [Create pairs on page 3-359](#)
- [Split pairs on page 3-362](#)
- [Resynchronize pairs on page 3-364](#)
- [Restore pairs on page 3-366](#)
- [Delete pairs on page 3-367](#)
- [Edit pairs on page 3-368](#)
- [Monitor pair status—event wait on page 3-370](#)
- [CLI, CCI commands for local-replication on page 3-376](#)

Display pair and pool information

Command name

aureplicationlocal -refer

Description

The -refer option displays the specified pairs or all the pairs in the group.

Syntax

- To display pair information in a list:
`aureplicationlocal -unit unit_name -refer [-si] [-ss]
[-pvol lun] [-svol lun]`
- To display pair information in detail for each pair, include the -detail option:
`aureplicationlocal -unit unit_name -refer -detail
-pairname pair_name
-gno group_no | -gname group_name`
- To display pair information in detail for a specified P-VOL and S-VOL.:
`aureplicationlocal -unit unit_name -refer -detail
-pvol lun -svol lun`
- To display the pool list used by a pair:
`aureplicationlocal -unit unit_name -refer -poolinfo`
- To display the split time and the characters string added at the time of the split:
`aureplicationlocal -unit unit_name -refer -splitinfo`

Options

Table 3-23: Options for aureplicationlocal -refer

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Must 64 characters or fewer, with alphanumeric and special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ (space)”. A space in front and back of the character string is removed.
-refer	Displays the pair information.
-si	Specify for ShadowImage pair.
-ss	Specify for SnapShot pair.
-pvol <i>lun</i>	Specify the logical unit number of the P-VOL.
-svol <i>lun</i>	Specify the logical unit number of the ShadowImage S-VOL or SnapShot V-VOL.
-detail	Specify to display detailed pair information.
-splitinfo	Specify to display split information.
-poolinfo	Specify to display pool information.
-pairname <i>pair_name</i>	Specify the pair name (see note).
-gno <i>group_no</i>	Specify the group number.
-gname <i>group_name</i>	Specify the group name (see note.).



NOTE: A pair name and group name must be fewer than or equal to 31 ASCII characters consisting of alphabetic characters, numerals, and the following symbols: %, *, +, -, ., /, =, @, _, :, [,]. When specifying a pair name that doesn't belong to a group, use "Ungrouped" in the group name.

Returned values

- Normal termination: 0.
- Abnormal termination: Other than 0

Examples

```
% aureplicationlocal -unit array1 -refer
Pair Name          LUN Pair LUN  Status
Copy Type  Group
SI_LU0001_LU0002   1      2  Paired(100%)
ShadowImage ---:Ungrouped
SI_LU0003_LU0004   3      4  Paired(100%)
ShadowImage ---:Ungrouped
SS_LU0005_LU0015   5     15  Split(100%)
SnapShot  ---:Ungrouped
SS_LU0006_LU0016   6     16  Paired(100%)
SnapShot  ---:Ungrouped
%
```

```
% aureplicationlocal -unit array1 -refer -detail -pvol 1 -svol 2
Pair Name          : SI_LU0001_LU0002
LUN                 : 1
Pair LUN            : 2
Capacity            : 1.0 GB
Status              : Paired(100%)
Copy Type           : ShadowImage
Group               : ---:Ungrouped
Data Pool           : N/A
Data Pool Usage Rate : N/A
Split Time          : ---
Split String        :
Copy Pace           : Normal
%
```

```
% aureplicationlocal -unit array1 -refer -splitinfo -ss
Pair Name          LUN Pair LUN  Split Time          Split String
SS_LU0005_LU0015   5      15  2011/09/11 18:06:47  backupdata1
SS_LU0006_LU0016   6      16  ---
%
```

```
% aureplicationlocal -unit array1 -refer -poolinfo -ss
Pair Name          LUN Pair LUN      DP Pool  Data Pool Usage Rate
SS_LU0005_LU0015  5              15 00%
SS_LU0006_LU0016  6              1  0%
%
```

Display volumes available for use in pairs

Command name

aureplicationlocal -availablelist

Description

The `-availablelist` option displays a list of volumes that are available for use in a pair.

Syntax

To display a list of available P-VOLs or S-VOLs:

```
aureplicationlocal -unit unit_name -availablelist
                    -si | -ss
                    -pvol lun | -svol lun
```

Options

Table 3-24: Options for aureplicationlocal -availablelist

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_", ".", "@", or " (space)". Space in front and back of the character string is removed
-availablelist	Displays a list of the volumes that can be used in a pair.
-si	Specify for a ShadowImage pair.
-ss	Specify for a Snapshot pair.
-pvol <i>lun</i>	Specify to display the luns available for use as a P-VOL.
-svol <i>lun</i>	Specify to indicate luns available for use as an S-VOL.
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_", ".", "@", or " (space)". Space in front and back of the character string is removed

Returned values

- Normal termination: 0.

- Abnormal termination: Other than 0

Example

```
% aureplicationlocal -unit array1 -availablelist -si -pvol
Available Logical Units
  LUN  Capacity RAID Group  DP Pool RAID Level  Type Status
    1    1.0 GB      0      N/A  6( 4D+2P) SAS Normal
    2    1.0 GB      0      N/A  6( 4D+2P) SAS Normal
    3    1.0 GB      0      N/A  6( 4D+2P) SAS Normal
    4    1.0 GB      0      N/A  6( 4D+2P) SAS Normal
    5    1.0 GB      0      N/A  6( 4D+2P) SAS Normal
    6    1.0 GB      0      N/A  6( 4D+2P) SAS Normal
%
```

Display or define the SnapShot volume (V-VOL)

Command name

aureplicationvvol

Description

Use the aureplicationvvol command to display SnapShot logical unit (V-VOL) information, or to set up the V-VOL.

Syntax

- To display SnapShot logical units in a list:
aureplicationvvol -unit unit_name -refer [-m | -g | -t |
-auto]
- To create a new SnapShot logical unit:
aureplicationvvol -unit unit_name -add [-lu lun]
-size num[m | g | t]
- To delete a SnapShot logical unit:
aureplicationvvol -unit unit_name -rm -lu lun

Options

Table 3-25: Options for aureplicationvvol

Options	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", "." (period)", "@", or " (space)". Space in front and back of the character string is removed.
-refer	Displays the SnapShot logical unit (V-VOL).
-add	Creates the SnapShot logical unit (V-VOL).
-rm	Deletes the SnapShot logical unit (V-VOL).
-lu <i>lun</i>	Specify the logical unit number to be used or deleted. When this options is omitted when create SnapShot logical unit, Navigator 2 will be assigned the lowest number of the available LUNs.
-size num[m g t]	Specify the capacity of SnapShot logical unit. When specifying the capacity in MB, add "m" or "M" to the command option. When specifying the capacity in GB, add "g" or "G" to the command option. When specifying the capacity in TB, add "t" or "T" to the command option.
-m -g -t -auto	Specify the capacity unit. When this option is omitted, the capacity is expressed in blocks. -m: MB -g: GB -t: TB -auto: If the capacity is 1 TB or more, it is displayed in TB. If 1 GB or more and fewer than 1 TB, it is displayed in GB. If fewer than 1 GB, it is displayed in GB.

Returned values

- Normal termination: 0
- Abnormal termination: Other than 0

Example

```
% aureplicationvvol -unit Array1 -add -lu 20 -size 1g
Are you sure you want to create the SnapShot logical unit 20?
(y/n [n]): y
The SnapShot logical unit has been successfully created.
%
```

Display or set up the data pool

Command name

aupool

Description

Use the aupool command to display data pool or available LU information, to create or delete a data pool, add LU's to a data pool, or delete a data pool.

Syntax

- To display current data pool information:
aupool -unit unit_name -refer [-poolno pool_no]
- To display logical units that are available for use in a data pool:
aupool -unit unit_name -availablelist -poolno pool_no
- To add a logical unit to a data pool, or to create a data pool:
aupool -unit unit_name -add -poolno pool_no -lu lun ...
- To delete a data pool:
aupool -unit unit_name -rm -poolno pool_no
- To change the threshold value:
aupool -unit unit_name -chg -poolno pool_no -thres num

Options

Table 3-26: Options for aupool

Options	Description
-unit <i>unit_name</i>	Specify the name of the array unit. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-" (minus), "_" (underline), "." (period), "@", or " " (space)". Space in front and back of the character string is removed.
-refer	Displays data pool information.
-add	Adds an LU to the data pool.
-rm	Deletes the LU from the data pool.
-chg	Changes the threshold of the data pool usage rate.
-poolno <i>pool_no</i>	Specify the data pool number.
-availablelist	Displays a list of LU numbers available for use in a data pool.

Table 3-26: Options for aupool (Continued)

Options	Description
-lu <i>lun ...</i>	Specify the LU number to be added to the data pool. Single or multiple LU numbers can be specified. - Examples: -lu 3 -lu 0 1 2 3 4 5 8 -lu 0-5 8
-thres <i>num</i>	Specify the threshold percentage for data pool usage rate. 70-percent is the default.

Returned values

- Normal termination: 0
- Abnormal termination: Other than 0

Example

```
% aupool -unit Array1 -refer
Data Pool      : 0
Data Pool Usage Rate: 0% (0.0/10240.0 MB)
Threshold      : 70%
Usage Status    : Normal
LUN Capacity   RAID Group DP Pool RAID Level Type Status
100 10.0 GB      0        N/A      6(4D+2P)  SAS  Normal
%
```

Create pairs

Command name

```
aureplicationlocal -create
```

Description

Use the `aureplicationlocal -create` command to create a pair.

Syntax

- **ShadowImage**
 - To create a pair that is not in a group:

```
aureplicationlocal -unit unit_name -create -si
                    -pvol lun -svol lun [ -pairname
                    pair_name ]
                    [ -pace prior | normal | slow ]
                    [ -noread ]
                    [ -nocopy ]
                    [ -muno mu_no ]
```
 - To create a new group and create a pair belonging to the group:

```
aureplicationlocal -unit unit_name -create -si
```

- pvol lun -svol lun [-pairname pair_name]
 - gno group_no
 - [-pace prior | normal | slow]
 - [-noread]
 - [-nocopy]
 - [-muno mu_no]
- To create a pair and add the pair to an existing group:
 - aureplicationlocal -unit unit_name -create -si
 - pvol lun -svol lun [-pairname pair_name]
 - gno group_no | -gname group_name
 - [-pace prior | normal | slow]
 - [-noread]
 - [-nocopy]
 - [-muno mu_no]
- **Snapshot**
 - To create a pair that is not in a group:
 - aureplicationlocal -unit unit_name -create -ss
 - pvol lun -svol lun [-pairname pair_name]
 - [-localpoolno pool_no]
 - [-pace prior | normal | slow]
 - [-compsplit]
 - [-muno mu_no]
 - To create a new group and create a pair belonging to the group:
 - aureplicationlocal -unit unit_name -create -ss
 - pvol lun -svol lun [-pairname pair_name]
 - gno group_no
 - [-localpoolno pool_no]
 - [-pace prior | normal | slow]
 - [-muno mu_no]
 - To create a pair and add the pair to an existing group:
 - aureplicationlocal -unit unit_name -create -ss
 - pvol lun -svol lun [-pairname pair_name]
 - gno group_no | -gname group_name
 - [-localpoolno pool_no]
 - [-pace prior | normal | slow]
 - [-muno mu_no]
 - [-muno mu_no]

Options

Table 3-27: Options for aureplicationlocal -create

Options	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period), “@”, or “ (space)”. Space in front and back of the character string is removed.
-create	Specify this option to create pairs.
-si	Specify for ShadowImage.
-ss	Specify for SnapShot.
-pvol <i>lun</i>	Specify the logical unit number to be the P-VOL.
-svol <i>lun</i>	Specify the logical unit number to be the S-VOL.
-pairname <i>pair_name</i>	Specify the pair name (see note). When this option is omitted, Navigator 2 adds the following name. - ShadowImage pair: SI_LUXXXX_LUYYYY - SnapShot pair: SS_LUXXXX_LUYYYY - XXXX: Logical unit number of the P-VOL (4 digits with 0) - YYYY: Logical unit number of the S-VOL (4 digits with 0)
-localpoolno <i>pool_no</i>	Specify the data pool number when creating a SnapShot pair. If this option is omitted, Navigator 2 uses the lowest available number.
-gno <i>group_no</i>	Use when creating pair that belongs to the specified group. When the specified group does not exist, a new group is created.
-gname <i>group_name</i>	Use when creating a pair and adding to the specified group. When the specified group already exists, created pairs are added to the specified group (see note).
-pace prior normal slow	Specify the copy pace at the time of initial copy or when restoring a copy. When this option is omitted, Navigator 2 sets Normal. prior: Fast normal: Medium slow: Slow
-compsplit	Specify to split a pair automatically, immediately after pair creation.
-noread	Specify to make the S-VOL unavailable for reads after pair creation. This option is for ShadowImage only.
-nocopy	Specify when not copying from the S-VOL to the P-VOL after the pair creation.
-muno	Specify MU numbers at the time of pair creation. You can specify MU numbers with any numbers from 0 to 39 for ShadowImage pairs and from 0 to 1032 for SnapShot pairs. The MU numbers already used by other ShadowImage pairs or SnapShot pairs which share the P-VOL cannot be specified. If you do not specify MU numbers, free MU numbers are assigned automatically in ascending order from 1 for ShadowImage pairs and in descending order from 1,032 for SnapShot pairs.



NOTE: Observe the following conventions for pair name character limits:

A pair name and group name must be fewer than or equal to 31 ASCII characters consisting of alphabetic characters, numerals, and the following symbols: %, *, +, -, ., /, =, @, _, :, [,]. Do not use "Ungrouped" in the group name with this command.

If the MU numbers from 0 to 39 are already used, any more ShadowImage pairs cannot be created. When creating SnapShot pairs, specify the MU numbers from 40 or more.

Returned values

- Normal termination: 0
- Abnormal termination: Other than 0

Example

```
% aureplicationlocal -unit array1 -create -si -pvol 100 -svol 200
                        -pairname PAIR_SI_010 -gno 1
Are you sure you want to create pair "PAIR_SI_010"?
(y/n [n]): y
The pair has been created successfully.
%
```

Split pairs

Command name

aureplicationlocal -split

Description

The aureplicationlocal -split command is used to split a pair or all pairs in the group.

Syntax

- **ShadowImage**
 - To split a pair by specifying the pair name:

```
aureplicationlocal -unit unit_name -split -si
                    -pairname pair_name
                    -gno group_no | -gname group_name
                    [ -force ]
                    [ -splitstr split_str ]
```
 - To split a pair by specifying the P-VOL and S-VOL:

```
aureplicationlocal -unit unit_name -split -si
                    -pvol lun -svol lun
```

- [-force]
 - [-splitstr split_str]
- To split the pairs in a group:


```
aureplicationlocal -unit unit_name -split -si
                    -gno group_no | -gname group_name
                    [ -force ]
                    [ -splitstr split_str ]
```
- **SnapShot**
 - To split a pair by specifying the pair name:


```
aureplicationlocal -unit unit_name -split -ss
                    -pairname pair_name
                    -gno group_no | -gname group_name
                    [ -splitstr split_str ]
```
 - To split a pair by specifying the P-VOL and S-VOL:


```
aureplicationlocal -unit unit_name -split -ss
                    -pvol lun -svol lun
                    [ -splitstr split_str ]
```
 - To split the pairs in a group:


```
aureplicationlocal -unit unit_name -split -ss
                    -gno group_no | -gname group_name
                    [ -splitstr split_str ]
```

Options

Table 3-28: Options for aureplicationlocal -split

Options	Description
-unit <i>unit_name</i>	The array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_", "." (underline), ".", "@", or " (space)". Space in front and back of the character string is removed.
-split	Specify to split pairs.
-si	Specify for ShadowImage pairs.
-ss	Specify for SnapShot pairs.
-pvol <i>lun</i>	The logical unit number to be the P-VOL.
-svol <i>lun</i>	The logical unit number to be the S-VOL.
-pairname <i>pair_name</i>	The name of the pair to be split (see note).
-gno <i>group_no</i>	Use to split pairs that belong to the specified group. When the pair name is not specified, all pairs in the group are split.
-gname <i>group_name</i>	Use to split pairs that belong to the specified group. When the pair name is not specified, all pairs in the group are split (see note).
-force	Use to split pairs forcibly. This option is for ShadowImage only.

Table 3-28: Options for aureplicationlocal -split

-splitstr <i>split_str</i>	Adds the specified character string to a pair and splits it. This option cannot be specified together with the -force option.
----------------------------	---



NOTE: A pair name and group name must be fewer than or equal to 31 ASCII characters consisting of alphabetic characters, numerals, and the following symbols: %, *, +, -, ., /, =, @, _, :, [,]. When specifying a pair name that doesn't belong to a group, use "Ungrouped" in the group name.

Returned values

- Normal termination: 0
- Abnormal termination: Other than 0

Example

```
% aureplicationlocal -unit array1 -split -ss -pairname
PAIR_SS_010
                                -gname CTG1 -splitstr ABCDEF
Are you sure you want to split pair?
(y/n [n]): y
The split of pair has been required.
%
```

Resynchronize pairs

Command name

aureplicationlocal -resync

Description

The aureplicationlocal -resync option is used to resynchronize the specified pair, or pairs in a group.

Syntax

- To resynchronize a pair by specifying the pair name:
aureplicationlocal -unit unit_name -resync
-si | -ss
-pairname pair_name
-gno group_no | -gname group_name
- To resynchronize a pair by specifying the P-VOL and S-VOL:
aureplicationlocal -unit unit_name -resync
-si | -ss
-pvol lun -svol lun

- To resynchronize the pairs in a group:

```
aureplicationlocal -unit unit_name -resync
                    -si | -ss
                    -gno group_no | -gname group_name
```

Options

Table 3-29: Options for aureplicationlocal -resync

Option	Description
-unit <i>unit_name</i>	Specify the array unit name that resynchronizes pairs. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and back of the character string is removed.
-resync	Use to resynchronize pairs.
-si	Specify for ShadowImage pairs.
-ss	Specify for SnapShot pairs.
-pvol <i>lun</i>	Specify the logical unit number of the P-VOL.
-svol <i>lun</i>	Specify the logical unit number of the S-VOL.
-pairname <i>pair_name</i>	Specify the pair name. When this option is omitted, all pairs that belong to the specified group are resynchronized (see note).
-gno <i>group_no</i>	Resynchronize pairs that belong to the specified group. When the pair name is not specified, all pairs that belong to the specified group are resynchronized.
-gname <i>group_name</i>	Resynchronize pairs that belong to the specified group. When the pair name is not specified, all pairs that belong to the specified group are resynchronized (see note).



NOTE: A pair name and group name must be fewer than or equal to 31 ASCII characters consisting of alphabetic characters, numerals, and the following symbols: %, *, +, -, ., /, =, @, _ , : , [,] . When specifying a pair name that doesn't belong to a group, use "Ungrouped" in the group name.

Returned values

- Normal termination: 0
- Abnormal termination: Other than 0:

Example

```
% aureplicationlocal -unit array1 -resync -si -pairname PAIR_SI_010 -gname CTG1
Are you sure you want to re-synchronize pair?
(y/n [n]): y
The re-synchronizing of pair has been required.
%
```

Restore pairs

Command name

aureplicationlocal -restore

Description

The aureplicationlocal -restore option is used to restore the specified pair or pairs in the group.

Syntax

- To restore a pair for the specified pair name:
aureplicationlocal -unit unit_name -restore
-si | -ss
-pairname pair_name
-gno group_no | -gname group_name
- To restore a pair for the specified P-VOL and S-VOL:
aureplicationlocal -unit unit_name -restore
-si | -ss
-pvol lun -svol lun
- To restore all pair in a group:
aureplicationlocal -unit unit_name -restore
-si | -ss
-gno group_no | -gname group_name

Options

Table 3-30: Options for aureplicationlocal -restore

Options	Description
-unit <i>unit_name</i>	Specify the array unit name that restores pairs. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ".", "@", or " (space)". Space in front and back of the character string is removed.
-restore	Use to restore pairs.
-si	Specify for ShadowImage pairs.
-ss	Specify for Snapshot pairs.
-pvol <i>lun</i>	Specify the logical unit number of the P-VOL.
-svol <i>lun</i>	Specify the logical unit number of the S-VOL.
-pairname <i>pair_name</i>	Specify the pair name. When this option is omitted, all pairs which belong to the specified group are restored (see note).
-gno <i>group_no</i>	Restore pairs which belong to the specified group. When the pair name is not specified, all pairs in the specified group are restored.

Table 3-30: Options for aureplicationlocal -restore

-gname <i>group_name</i>	Restore pairs which belong to the specified group. When the pair name is not specified, all pairs in the specified group are restored (see note).
--------------------------	---



NOTE: A pair name and group name must be fewer than or equal to 31 ASCII characters consisting of alphabetic characters, numerals, and the following symbols: %, *, +, -, ., /, =, @, _, :, [,]. When specifying a pair name that doesn't belong to a group, use "Ungrouped" in the group name.

Returned values

- Normal termination: 0
- Abnormal termination: Other than 0:

Example

```
% aureplicationlocal -unit Array1 -restore -ss -pvol 10 -svol 100
Are you sure you want to restore pair?
(y/n [n]): y
The restoring of pair has been required.
%
```

Delete pairs

Command name

aureplicationlocal -simplex

Description

The aureplicationlocal -simplex option is used to delete the specified pair or pairs in a group.

Syntax

- To delete a pair by specifying the pair name:
aureplicationlocal -unit unit_name -simplex
-si | -ss
-pairname pair_name
-gno group_no | -gname group_name
- To delete a pair by specifying the P-VOL and S-VOL:
aureplicationlocal -unit unit_name -simplex
-si | -ss
-pvol lun -svol lun
- To delete all pair in a group:
aureplicationlocal -unit unit_name -simplex
-si | -ss

-gno group_no | -gname group_name

Options

Table 3-31: Options for aureplicationlocal -simplex

Options	Description
-unit <i>unit_name</i>	Specify the array unit name that deletes pairs. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ".", "@", or " (space)". Space in front and back of the character string is removed.
-simplex	Release pairs.
-si	Specify for ShadowImage pairs.
-ss	Specify for the SnapShot pairs.
-pvol <i>lun</i>	Specify the logical unit number to be the P-VOL.
-svol <i>lun</i>	Specify the logical unit number to be the S-VOL.
-pairname <i>pair_name</i>	Specify the pair name. When this option is omitted, all pairs which belong to the specified group are deleted (see note).
-gno <i>group_no</i>	Specify the group number. If the pair name is not specified, all pairs which belong to the specified group are deleted.
-gname <i>group_name</i>	Specify the group name. If the pair name is not specified, all pairs which belong to the specified group are deleted (see note).



NOTE: A pair name and group name must be fewer than or equal to 31 ASCII characters consisting of alphabetic characters, numerals, and the following symbols: %, *, +, -, ., /, =, @, _, :, [,]. When specifying a pair name that doesn't belong to a group, use "Ungrouped" in the group name.

Returned values

- Normal termination: 0
- Abnormal termination: Other than 0:

Example

```
% aureplicationlocal -unit array1 -simplex -ss -pairname PAIR_SS_010 -gname CTG1
Are you sure you want to release pair?
(y/n [n]): y
The pair has been released successfully.
%
```

Edit pairs

Command name

aureplicationlocal -chg

Description

The `aureplicationlocal -chg` option is used to change the group name, pair name, or copy pace.

Syntax

- To change a group name:

```
aureplicationlocal -unit unit_name -chg  
                    -gno group_no | -gname group_name  
                    -newgname new_group_name
```
- To change a pair name or copy pace by specifying the pair name:

```
aureplicationlocal -unit unit_name -chg  
                    -si | -ss  
                    -pairname pair_name  
                    -gno group_no | -gname group_name  
                    [ -newpairname new_pair_name ]  
                    [ -pace prior | normal | slow ]
```
- To change the pair name or the copy pace by specifying the P-VOL and S-VOL:

```
aureplicationlocal -unit unit_name -chg  
                    -si | -ss  
                    -pvol lun -svol lun  
                    [ -newpairname new_pair_name ]  
                    [ -pace prior | normal | slow ]
```

Options

Table 3-32: Options for aureplicationlocal -chg

Options	Description
<code>-unit unit_name</code>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_", ".", "@", or " (space)". Space in front and back of the character string is removed.
<code>-chg</code>	Changes the group information or pair information.
<code>-si</code>	Specify for ShadowImage pairs.
<code>-ss</code>	Specify for SnapShot pairs.
<code>-pvol lun</code>	Specify the logical unit number to be the P-VOL.
<code>-svol lun</code>	Specify the logical unit number to be the S-VOL.
<code>-pairname pair_name</code>	Specify the current pair name (see note).
<code>-gno group_no</code>	Specify the group number.
<code>-gname group_name</code>	Specify the current group name. *
<code>-pace prior normal slow</code>	Changes the copy pace. prior: Fast normal: Medium slow: Slow

Table 3-32: Options for aureplicationlocal -chg (Continued)

Options	Description
-newgname <i>new_group_name</i>	Changes the group name to the new name. **
-newpairname <i>new_pair_name</i>	Changes the pair name to the new name (see note).



NOTE: A pair name and group name must be fewer than or equal to 31 ASCII characters consisting of alphabetic characters, numerals, and the following symbols: %, *, +, -, ., /, =, @, _, :, [,].

* When specifying a pair name that doesn't belong to a group, use "Ungrouped" in the group name.

** For a new group name, do not specify "Ungrouped". An error occurs if it is specified at the time of creation.

Returned values

- Normal termination: 0
- Abnormal termination: Other than 0:

Example

```
% aureplicationlocal -unit array1 -chg -pvol 20 -svol 200 -newpairname PAIR_SI_010
Are you sure you want to change pair information?
(y/n [n]): y
The pair information has been changed successfully.
%
```

Monitor pair status—event wait

This command is used to monitor pair status for local and remote replication.

Command name

aureplicationmon -evwait

Description

The aureplicationmon -evwait command instructs the system to display the pair status when it becomes the status that was specified in the command, for the specified pair or pairs in the group. It is also used to displays the current pair status.

Syntax

- Displays the specified status for the pairs in the group.

```
aureplicationmon -unit unit_name -evwait
                  -si | -ss | -tc | -tce
                  -gno group_no | -gname group_name
                  -st [ simplex ] [ sync ] [ paired ]
```

```

        [ split ][ failure ] [ takeover ]
    -waitmode recovery | backup
    [ -timeout time ]

```

- Displays the specified status for the specified P-VOL and S-VOL

```

aureplicationmon -unit unit_name -evwait
                  -si | -ss | -tc | -tce
                  -pairname pair_name
                  -gno group_no | -gname group_name
                  -st [ simplex ] [ sync ] [ paired ]
                     [ split ] [ failure ] [ takeover ]
                  -pvol | -svol
                  [ -timeout time ]

```

- Displays current status for the specified group:

```

aureplicationmon -unit unit_name -evwait
                  -si | -ss | -tc | -tce
                  -gno group_no | -gname group_name
                  -waitmode recovery | backup
                  -nowait

```

- Waits until the pair status becomes the specified status for the pairs in the group.

```

aureplicationmon -unit unit_name -evwait
                  -si | -ss | -tc | -tce
                  -gno group_no | -gname group_name
                  -st [ simplex ] [ sync ] [ paired ] [ split ]
                     [ failure ] [ takeover ] [ splitpending ]
                  -waitmode recovery | backup
                  [ -timeout time ]

```

- Waits until the pair status becomes the specified status.

```

aureplicationmon -unit unit_name -evwait
                  -si | -ss | -tc | -tce
                  -pairname pair_name
                  -gno group_no | -gname group_name
                  -st [ simplex ] [ sync ] [ paired ] [ split ]
                     [ failure ] [ takeover ] [ splitpending ]
                  -pvol | -svol
                  [ -timeout time ]

```

- To get the current status of the specified group:

```

aureplicationmon -unit unit_name -evwait
                  -si | -ss | -tc | -tce
                  -gno group_no | -gname group_name
                  -waitmode recovery | backup
                  -nowait

```

- To get the current status of the specified pair:

```

aureplicationmon -unit unit_name -evwait
                  -si | -ss | -tc | -tce
                  -pairname pair_name
                  -gno group_no | -gname group_name
                  -nowait

aureplicationmon -unit unit_name -evwait
                  -si | -ss | -tc | -tce
                  -pairname pair_name

```

-gno group_no | -gname group_name
-nowait

Options

Table 3-33: Options for aureplicationmon -evwait

Options	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in fewer than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ".", "@", or " (space)". Space in front and back of the character string is removed.
-evwait	Waits for the specified status or gets the current status.
-si	Specify for ShadowImage pairs.
-ss	Specify for SnapShot pairs.
-tc	Specify for TrueCopy pair.
-tce	Specify for the TCE pair.
-pairname <i>pair_name</i>	Specify the pair name (see note).
-gno <i>group_no</i>	Specify the group number (see note)
-gname <i>group_name</i>	Specify the group name (see note)
-st [simplex] [sync] [paired] [split] [failure] [takeover]	Specify the pair status that you want to wait for.
-waitmode recovery backup	Specify the mode that defines the status of a group in which the specified pair status is desired. The two modes you can specify are: - recovery: For disaster recovery. - backup: For backup use. See the waitmode discussion following the note.
-pvol	Specify monitoring target to P-VOL
-svol	Specify monitoring target to S-VOL
-nowait	Gets the current status of the pair or the group.
-timeout <i>time</i>	Specify time-out time. When this option is omitted, the time-out time set 3 seconds. time = time-out time (0 to 180)



NOTE: A pair name and group name must be fewer than or equal to 31 ASCII characters consisting of alphabetic characters, numerals, and the following symbols: %, *, +, -, ., /, =, @, _, :, [,]. When specifying a pair name that doesn't belong to a group, use "Ungrouped" in the group name.

The following tables list group status for various features when the pair status is mixed in the group.

On waitmode: Tables 3-36 and 3-37 show how the pair status that is returned depends on the waitmode value, when the statuses differ for multiple pairs in a group.

For example, if a pair whose status is in the Split state, and another pair whose status is in the Paired state, exist in the same group, the pair status of the group (returned value) varies, depending on the value for waitmode. The pair status is in the Split state when waitmode is recovery, and it is Paired when waitmode is backup.

If you want to wait for all pairs to be in the Paired state, specify recovery for waitmode. In this mode, all other statuses have higher priority than Paired.

If you want to wait for the pair statuses of all the pairs to be Split, specify backup for the waitmode. In this mode, all other statuses have higher priority than Split.

**Table 3-34: Group Status
Priorities for Recovery
Waitmode**

(ShadowImage/SnapShot)	
Priority	Pair Status
1	Synchronizing
2	Failure
3	Split
4	Threshold Over
5	Paired
6	Simplex

**Table 3-35: Group Status
Priorities for Backup Waitmode**

(ShadowImage/SnapShot)	
Priority	Pair Status
1	Synchronizing
2	Failure
3	Paired
4	Threshold Over
5	Split
6	Simplex

Table 3-36: ShadowImage/SnapShot

Priority	Pair Status
1	Synchronizing
2	Failure
3	Split Pending
4	Split

5	Threshold Over
6	Paired Internally Synchronizing
7	Paired
8	Simplex

ShadowImage/SnapShot

Priority	Pair Status
1	Synchronizing
2	Failure
3	Paired
4	Paired Internally Synchronizing
5	Threshold Over
6	Split Pending
7	Split
8	Simplex

Table 3-37: Group Status Priorities for Recovery Waitmode

(ShadowImage/SnapShot)	
Priority	Pair Status
1	Synchronizing
2	Failure
3	Split
4	Threshold Over
5	Paired
6	Simplex

(TrueCopy/TCE)	
Priority	Pair Status
1	Synchronizing
2	Failure
3	Inconsistent
4	Pool Full
5	Split
6	Busy
7	Takeover
8	Paired
9	Simplex

Table 3-38: Group Status Priorities for Backup Waitmode

(ShadowImage/SnapShot)	
Priority	Pair Status
1	Synchronizing
2	Failure
3	Paired
4	Threshold Over
5	Split
6	Simplex

(TrueCopy/TCE)	
Priority	Pair Status
1	Synchronizing
2	Failure
3	Inconsistent
4	Paired
5	Pool Full
6	Busy

Table 3-38: Group Status Priorities for Backup Waitmode

7	Takeover
8	Split
9	Simplex

Table 3-40: TrueCopy / TCE Recovery Mode

Priority	Pair Status
1	Synchronizing
2	Failure
3	Inconsistent
4	Pool Full
5	Split
6	Busy
7	Takeover
8	Paired
9	Simplex

Table 3-41: TrueCopy / TCE Backup Mode

Priority	Pair Status
1	Synchronizing
2	Failure
3	Inconsistent
4	Paired
5	Pool Full
6	Busy
7	Takeover
8	Split
9	Simplex

Returned values

The following values are returned corresponding to the pair status when the command execution is completed. If you specify the `-nowait` option, the P-VOL status is returned.

Table 3-42: Returned Values for -evwait

Monitoring Volume	Status	Returned Value
P-VOL or S-VOL	Simplex	10

Table 3-42: Returned Values for -evwait

P-VOL	Synchronizing	11
	Reverse Synchronizing	11
	Paired	12
	Split	13
	Failure	14
	Threshold Over	15
	Pool Full	16
	Inconsistent	17
	Busy	18
S-VOL	Synchronizing	21
	Paired	22
	Split	23
	Failure	24
	Takeover	25
	Pool Full	26
	Inconsistent	27
	Busy	28

Example

```
% aureplicationmon -unit array1 -evwait -si -pairname SI_LU0001_LU0002
-gname Ungrouped -st paired -pvol
Paired Status Monitoring...
Status has been changed to Paired.
%
```

CLI, CCI commands for local-replication**Table 3-43: CLI, CCI Commands for Remote Repl.**

Description	CLI Command	CCI Command
Display pair information	aureplicationlocal -refer	pairedisplay
Create pairs	aureplicationlocal -create	paircreate
Split pairs	aureplicationlocal -split	pairsplit
Resynchronize pairs	aureplicationlocal -resync	pairresync
Restore pairs	aureplicationlocal -restore	pairresync -restore
Delete pairs	aureplicationlocal -simplex	pairsplit -S
Event wait	aureplicationmon -evwait	pairevtwait

CLI Commands for Remote Replication

- This section covers the following commands related to remote replication parameters:
- [Display pair and pool information on page 3-377](#)
- [Display volumes available for use in pairs on page 3-380](#)
- [Remote path—display, define, delete, repair on page 3-381](#)
- [Display remote path information on page 3-381](#)
- [Define the remote path on page 3-384](#)
- [Delete remote path target \(CHAP secret\) on page 3-387](#)
- [Reconstruct the remote path on page 3-388](#)
- [Delete the remote path on page 3-389](#)
- [Creating pairs on page 3-393](#)
- [Split pairs on page 3-396](#)
- [Resynchronize pairs on page 3-398](#)
- [Swap pairs on page 3-400](#)
- [Delete pairs on page 3-401](#)
- [Edit pairs on page 3-404](#)
- [CLI, CCI commands for remote-replication on page 3-410](#)

Display pair and pool information

Command name

`aureplicationremote -refer`

Description

The `aureplicationremote -refer` command displays the specified pairs or all the pairs in the group.

Syntax

- To display pair information in a list:

```
aureplicationremote -unit unit_name -refer [-tc][-tce]
                                     [ -pvol lun ] [ -svol lun ]
```
- To display pair information in detail for each pair, include the `-detail` option:

```
aureplicationremote -unit unit_name -refer -detail
                                     -pairname pair_name
                                     -gno group_no | -gname group_name
```
- To display pair information in detail for a specified P-VOL and S-VOL:

```
aureplicationremote -unit unit_name -refer -detail
```

-pvol lun -svol lun

- To display the DP pool list that the pair used, specify as shown below:

aureplicationremote -unit unit_name -refer -dppoolinfo

- To display the pool list that a pair uses, specify as shown:

aureplicationremote -unit unit_name -refer -poolinfo

- To display the group information of the pair, specify as shown below:

aureplicationremote -unit unit_name -refer -groupinfo

Options

Table 3-44: Options for aureplicationremote -refer

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Must be less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", "." (period)", "@", or " (space)". Space in front and back of the character string is removed.
-refer	Displays the pair information.
-tc	Specify for TrueCopy pairs.
-tce	Specify when displaying the TCE pair.
-pvol <i>lun</i>	Specify the logical unit number of the P-VOL.
-svol <i>lun</i>	Specify the logical unit number of the S-VOL or SnapShot Logical Unit (V-VOL).
-detail	Specify for detailed pair information.
-poolinfo	Specify for pool information.
-dppoolinfo	Specify when displaying the DP pool information.
-groupinfo	Specify when displaying the group information of TCE pair.
-pairname <i>pair_name</i>	Specify the pair name (see note).
-gno <i>group_no</i>	Specify the group number.
-gname <i>group_name</i>	Specify the group name (see note.)



NOTE: A pair name and group name must be less than or equal to 31 ASCII characters consisting of alphabetic characters, numerals, and the following symbols: %, *, +, -, ., /, =, @, _, :, [,]. When specifying a pair name that doesn't belong to a group, use "Ungrouped" in the group name.

Returned values

- Normal termination: 0.
- Abnormal termination: Other than 0

Examples

```
% aureplicationremote -unit localarray -refer pair name Local LUN Attribute
Remote LUN Status
Copy Type Group Name
TC_LU0000_LU0000          0 P-VOL 0 Paired(100
%)          TrueCopy          ---:Ungrouped
TC_LU0001_LU0001  1      P-VOL 1 Paired(100
%)          TrueCopy          ---:Ungrouped
%
```

Example using -pairname option

```
% aureplicationremote -unit localarray -refer -detail -pairname
TCE_LU0000_LU0000
-gno 0
Pair Name          : TCE_LU0000_LU0000
Local Information
  LUN              : 0
  Attribute        : P-VOL
  DP Pool
    Replication Data : 0
    Management Area  : 0
Remote Information
  Array ID        : 91200007
  Path Name       : N/A
  LUN             : 0
  Capacity        : 50.0 GB
  Status          : Paired(100%)
  Copy Type       : TrueCopy Extended Distance
  Group           : 0:TCE_Group1
  Consistency Time : N/A
  Difference Size  : 0.0 MB
  Copy Pace       : Prior
  Fence Level     : N/A
  Previous Cycle Time : 0 sec.
%
```

Example using -dppoolinfo option

```
% aureplicationremote -unit localarray -refer -dppoolinfo
Pair name          Local LUN Attribute Remote LUN DP
Pool DP Pool Usage Rate
TCE_LU0000_LU0000          0 P-VOL          0
0          10%
%
```

Example using -groupinfo

```
% aureplicationremote -unit localarray -refer -groupinfo
Group CTL Lapsed Time Difference Size[MB] Transfer
Rate[KB/s] Transfer Completion
0:TCE_Group1 0 00:00:25          0          200
00:00:30
%
```

Display volumes available for use in pairs

Command name

aureplicationremote -availablelist

Description

The aureplicationremote -availablelist command displays a list of volumes that are available for use in a pair.

Syntax

To display a list of available P-VOLs or S-VOLs:

```
aureplicationremote -unit unit_name -availablelist
                    -tc | -tce
                    -pvol
```

Options

Table 3-45: Options for aureplicationremote -availablelist

Options	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), "." (period), "@", or " " (space). Space in front and back of the character string is removed
-availablelist	Displays volumes available for use in pairs.
-tc	Specify for TrueCopy pairs.
-tce	Specify for TCE pairs.
-pvol	Specify when displaying volumes for a P-VOL.

Returned values

- Normal termination: 0.
- Abnormal termination: Other than 0

Example

```
% aureplicationremote -unit array1 -availablelist -tc
-pvol
Available Logical Units
LUN  Capacity RAID Group DP Pool RAID Level Type Status
1    1.0 GB          0   N/A   6( 4D+2P)  SAS  Normal
2    1.0 GB          0   N/A   6( 4D+2P)  SAS  Normal
3    1.0 GB          0   N/A   6( 4D+2P)  SAS  Normal
4    1.0 GB          0   N/A   6( 4D+2P)  SAS  Normal

%
```

Remote path—display, define, delete, repair

This section provides the commands for displaying, defining, deleting, and repairing the remote path, and defining and deleting the remote path target (CHAP Secret)

Display remote path information

Command name

```
aurmtpath -refer
```

Description

The `aurmtpath -refer` command displays remote path information.

Syntax

```
aurmtpath -unit unit_name -refer
```

Options

Table 3-46: Options for `aurmtpath -refer`

Options	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ (space)”. Space in front and back of the character string is removed.
-refer	Displays path information.

Returned values

- Normal termination: 0.
- Abnormal termination: Other than 0

Examples

For Fibre Channel

```
% aurmtpath -unit array1 -refer
Initiator Information
  Local Information
    Array ID      : 90000002
    Distributed Mode : N/A

  Path Information
    Interface Type      : FC
    Remote Array ID     : 91222345
    Remote Path Name    : Array_91222345
    Bandwidth [0.1 Mbps] : 15
    iSCSI CHAP Secret   : N/A

    Path  Status      Local      Remote  Remote Port  TCP Port No. of
    0     Normal      0A      N/A     N/A          Remote Port
    1     Normal      1A      N/A     N/A          N/A

%
```

For IPv4 iSCSI array model

```
% aurmtpath -unit array1 -refer
Initiator Information
  Local Information
    Array ID      : 900000002
    Distributed Mode : N/A

  Path Information
    Interface Type      : iSCSI
    Remote Array ID     : 90022345
    Remote Path Name    : Array_90022345
    Bandwidth [0.1 Mbps] : 15
    iSCSI CHAP Secret   : Disable

    Path  Status      Local      Remote      Remote Port      TCP Port No. of
    0     Normal      0A       N/A        192.168.0.201    3260
    1     Normal      1A       N/A        192.168.0.209    3260

  Target Information
    Local Array ID : 900000002
%
```

For IPv6 iSCSI:

```
For iSCSI array model:
% aurmtpath -unit array1 -refer
Initiator Information
  Local Information
    Array ID      : 912000002
    Distributed Mode : N/A

  Path Information
    Interface Type      : iSCSI
    Remote Array ID     : 91222345
    Remote Path Name    : Array_91222345
    Bandwidth [0.1 Mbps] : 40000
    iSCSI CHAP Secret   : Enable

    Path  Status      Local      Remote      Remote Port      TCP Port No. of
    0     Normal      0E       N/A        ffe0:ffe0:ffe0::ffff ffe0:ffe0:ffe0::ffff    25000
    1     Normal      1E       N/A        ffe0:ffe0:ffe0::ffff ffe0:ffe0:ffe0::ffff    25000

  Target Information
    Local Array ID : 912000002
%
```

For fibre channel

```
% aurmtpath -unit array1 -refer
Initiator Information
  Local Information
    Array ID      : 90000002
    Distributed Mode : N/A

  Path Information
    Interface Type      : FC
    Remote Array ID     : 90022345
    Remote Path Name    : Array_90022345
    Bandwidth [0.1 Mbps] : 15
    iSCSI CHAP Secret   : N/A

Path      Status      Local      Remote      Remote Port      TCP Port No. of
0 Normal      0A        0A        192.168.0.201      Remote Port      N/A
1 Normal      1A        1B        192.168.0.209      Remote Port      N/A
%
```

Define the remote path

Command name

aurmtpath -set

Description

Use the aurmtpath -set command to define the remote path or change the bandwidth.

Syntax

- For fibre channel:


```
aurmtpath -unit unit_name -set
          -remote array_id | -remotename remote_path_name
          -path0 0A | 0B | 0C | 0D | 0E | 0F | 0G | 0H
                0A | 0B | 0C | 0D | 0E | 0F | 0G | 0H |
                1A | 1B | 1C | 1D | 1E | 1F | 1G | 1H
          -path1 1A | 1B | 1C | 1D | 0E | 0F | 0G | 0H
                0A | 0B | 0C | 0D | 0E | 0F | 0G | 0H |
                1A | 1B | 1C | 1D | 1E | 1F | 1G | 1H |
          -band bandwidth
aurmtpath -unit unit_name -set
          -remote array_id
          -path0 0A | 0B
```

```

        0A | 0B | 1A | 1B
-path1 1A | 1B
        0A | 0B | 1A | 1B
-band bandwidth

```

- For iSCSI:

```

aurmtpath -unit unit_name -set -initiator
          -remote array_id [ -remotename remote_path_name ]
          -path0 0A | 0B
          -path0_addr inet_addr
          [ -path0_tcpportnum port_num ]
          -path1 1A | 1B
          -path1_addr inet_addr
          [ -path1_tcpportnum port_num ]
          -secret enable | disable
          -band bandwidth

aurmtpath -unit unit_name -set -initiator
          -remote array_id
          -path0 0A | 0B
          -path0_addr inet_addr
          [ -path0_tcpportnum port_num ]
          -path1 1A | 1B
          -path1_addr inet_addr
          [ -path1_tcpportnum port_num ]
          -secret enable | disable
          -band bandwidth

```

- To change the bandwidth or remote path name:

```

aurmtpath -unit unit_name -set
          -remote array_id | -remotename remote_path_name
          [ -band bandwidth ]
          [ -newremotename new_remote_path_name ]

aurmtpath -unit unit_name -set
          -remote array_id
          -band bandwidth

```

- To set the array mode:

```

aurmtpath -unit unit_name -set
          [ -distributedmode hub | edge ]

```

Options

Table 3-47: Options for aurmtpath -set

Options	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period)”, “@”, or “ ” (space)”. Space in front and back of the character string is removed.
-set	Sets the remote path information.
-remote array_id	Specify the remote array ID.
-remotename remote_path_name	Specify the remote path name. When the specification is omitted, the following name adds. Array_xxxxxxx xxxxxxx: Remote array ID remote_path_name : Remote path name (See Note 2)
-path0 local_path remote_path	Specify the local path 0 port number and remote path 0 port number.
-path1 local_path remote_path	Specify the local path 1 port number and remote path 1 port number.
-initiator	Specify when setting the initiator information.
-path0 0A 0B 0E 0F	Specify the path 0 information for iSCSI.
-path0_addr inet_addr	Specify the IP address of path 0 for iSCSI. inet_addr: IP address
-path0_tcpportnum port_num	Specify the path 0 port number for TCP/IP communication. If this option is omitted, the port number sets to 3260. port_num: Port number
-path1 1A 1B 1E 1F	Specify the path 1 information for iSCSI.
-path1_addr inet_addr	Specify the IP address of path 1 for iSCSI. inet_addr: IP address
-path1_tcpportnum port_num	Specify the path 1 port number for TCP/IP communication. If this option is omitted, the port number sets to 3260. port_num: Port number
-secret enable disable	Specify whether to set the Secret input to enable or disable.
-band bandwidth	Specify the line band of per 0.1 Mbps. For example, to set bandwidth to 0.1 Mbps, specify 1; to set bandwidth to 1.5 Mbps, specify 15, to set bandwidth to 20 Mbps, specify 200. bandwidth: Line band.
-newremotename new_remote_path_name	Specify the changed remote path name. new_remote_path_name : Remote path name (See Note 2)
-distributedmode hub edge	Specify whether to set the Distributed mode. hub : hub array edge : edge array

- For example if you want to set the bandwidth to 0.1 Mbps, specify 1 (the bandwidth to 1.5 Mbps, specify 15, the bandwidth to 20 Mbps, specify 200).
- For Remote Path Name, less than or equal to 32 ASCII characters (alphabetic characters, numerals, and the following symbols) can be used (% , * , + , - , . , / , = , @ , _ , : , [,]). The following character string cannot be used. (N/A, ---)

Returned values

- Normal termination: 0.
- Abnormal termination: Other than 0

Examples

For iSCSI

```
% aurmtpath -unit array1 -set -initiator -remote 9000000281000121
    -path0 0B -path0_addr 192.168.0.201 -path1 1B -path1_addr 192.168.0.209
    -secret disable -band 15
Are you sure you want to set the remote path information?
(y/n [n]): y
The remote path information has been set successfully.
%
```

For fibre channel

```
% aurmtpath -unit array1 -set -remote 90000002 -path0 0A 0A -path1 1A 1A -band 15
Are you sure you want to set the remote path information?
(y/n [n]): y
The remote path information has been set successfully.
%
% aurmtpath -unit array1 -set -remote 81000002 -path0 0A 0A -path1 1A 1A
    -band 15
Are you sure you want to set the remote path information?
(y/n [n]): y
The remote path information has been set successfully.
%
```

Delete remote path target (CHAP secret)

This command is for iSCSI only.

Command name

`aurmtpath -target`

Description

The `aurmtpath -target` command defines or deletes the CHAP secret.

Syntax

- To set the CHAP secret:
`aurmtpath -unit unit_name -set -target
 -local array_id
 -secret`

- To delete the CHAP secret:

```
aurmtpath -unit unit_name -rm [ -target ]
          -remote array_id | -remotename remote_path_name
```

Options

Table 3-48: Options for aurmtpath -target

Options	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", "." (period)", "@", or " (space)". Space in front and back of the character string is removed.
-set	Sets the remote path information.
-target	Specify this option to set or delete target information.
-local array_id	Specify the local array ID of target information.
-secret	Sets the CHAP Secret.
-rm	Deletes the remote path.
-remote array_id	Specify the remote array ID.
-remotename remote_path_name	Specify the remote path name. remote_path_name: Remote path name

Returned values

- Normal termination: 0.
- Abnormal termination: Other than 0

Example

```
% aurmtpath -unit array1 -set -target -local 9002234581000121
-secret
Are you sure you want to set the remote path information?
(y/n [n]): y
Please input Path 0 Secret.
Path 0 Secret:
Re-enter Path 0 Secret:
Please input Path 1 Secret.
Path 1 Secret:
Re-enter Path 1 Secret:
The remote path information has been set successfully.
%
```

Reconstruct the remote path

Command name

```
aurmtpath -reconst
```

Description

The `aurmtpath -reconst` command reconstructs the remote path.

Syntax

```
aurmtpath -unit unit_name -reconst -remote array_id |  
-remotename remote_path_name -path0 | -path1
```

Options

Table 3-49: Options for `aurmtpath -reconst`

Options	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_", ".", "@", or " " (space). Space in front and back of the character string is removed.
-reconst	Reconstructs the remote path.
-remote array_id	Specify the remote array ID.
-remotename remote_path_name	Specify the remote path name. remote_path_name : Remote path name
-path0 -path1	Specify the path to reconstruct.

Returned values

- Normal termination: 0.
- Abnormal termination: Other than 0

Example

```
% aurmtpath -unit array1 -reconst -remote 9000000281000121  
-path1  
Are you sure you want to reconstruct the remote path?  
(y/n [n]): y  
The reconstruction of remote path has been required.  
Please check "Status" as -refer option.  
%
```

Delete the remote path

Command name

```
aurmtpath -rm
```

Description

The `aurmtpath -rm` command deletes the remote path.

Syntax

```
aurmtpath -unit unit_name -rm -remote array_id | -remotename  
remote_path_name
```

Options

Table 3-50: Options for aurmtpath -rm

Options	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and back of the character string is removed.
-rm	Deletes the remote path.
-remote array_id	Specify the remote array ID.
-remotename remote_path_name	Specify the remote path name. remote_path_name: Remote path name

Returned values

- Normal termination: 0.
- Abnormal termination: Other than 0

Example

```
% aurmtpath -unit array1 -rm -remote 9000000281000121  
Are you sure you want to delete the remote path information?  
(y/n [n]): y  
The remote path information has been deleted successfully.  
%
```

Display or define TrueCopy options

The following sections provide commands for displaying and defining TrueCopy-related options. These options are Cycle Time and the Cycle Over report.

Display TrueCopy options

Command name

`autruecopyopt -refer`

Description

Use the `autruecopyopt -refer` option to display TrueCopy options: Cycle Time and the Cycle Over Report (accessed with SNMP).

Syntax

`autruecopyopt -unit unit_name -refer`

Options

Table 3-51: Options for `autruecopyopt -refer`

Options	Description
-unit unit_name	Specify the array unit name. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", "." (period)", "@", or " (space)". Space in front and back of the character string is removed.
-refer	Causes TrueCopy option information to display.

Returned values

- Normal termination: 0.
- Abnormal termination: Other than 0

Example

```
% autruecopyopt -unit array1 -refer
Cycle Time[sec.]           : 300
Cycle Over Report          : Disable
```

Command name

`autruecopyopt -set`

Description

Use the `autruecopyopt -set` option to define Cycle Time and Cycle Over report.

Format

- To define the cycle time:

```
autruecopyopt -unit unit_name -set -cycletime time
```

- To enable or disable the Cycle Over Report:

```
autruecopyopt -unit unit_name -set -cycleoverreport enable | disable
```

- To set the Remote Replication Write Control mode:

```
autruecopyopt -unit unit_name -set -writecontrolmode enable | disable
```

Options

Table 3-52: Options for `autruecopyopt -set`

Options	Description
-unit <i>unit_name</i>	Specify the array unit name that will be set the TrueCopy option information. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and back of the character string is removed.
-set	Sets the TrueCopy option information.
-cycletime <i>time</i>	Specify the cycle time. time: cycle time in seconds.
-cycleoverreport enable disable	Sets whether to enable or disable the cycle over report.
-writecontrolmode enable disable	Set whether to validate or invalidate the specification of the remote write control mode. • enable. Enables the specification of the remote replication with control mode. • disable. Disables the specification of the remote replication write control mode.

Returned values

- Normal termination: 0.
- Abnormal termination: Other than 0

Example

```
% autruecopyopt -unit array1 -set -cycletime 300 -cycleoverreport enable
Are you sure you want to set the TrueCopy options?
(y/n [n]): y
The TrueCopy options have been set successfully.
%
```

Creating pairs

Command name

```
aureplicationremote -create
```

Description

The `-create` option is used to create a pair. Specify a P-VOL as a local array volume and an S-VOL as a remote array volume.

Syntax

TrueCopy:

When creating a pair that doesn't belong to any group:

```
aureplicationremote -unit unit_name -create -tc
                    -pvol lun -svol lun [ -pairname pair_name ]
                    -remote array_id | -remotename_remote_path_name
                    [ -pace prior | normal | slow ]
                    [ -fencelvl never | data ]
                    [ -nocopy ]
```

When creating a new group and creating a pair that belong to the created group:

```
aureplicationremote -unit unit_name -create -tc
                    -pvol lun -svol lun [ -pairname pair_name ]
                    -gno group_no
                    -remote array_id | -remotename_remote_path_name
                    [ -pace prior | normal | slow ]
                    [ -fencelvl never | data ]
                    [ -nocopy ]
```

When creating a pair and adding the pair to already created group:

```
aureplicationremote -unit unit_name -create -tc
                    -pvol lun -svol lun [ -pairname pair_name ]
                    -gname group_name
                    -remote array_id | -remotename_remote_path_name
                    [ -pace prior | normal | slow ]
                    [ -fencelvl never | data ]
                    [ -nocopy ]
```

TCE:

When creating a new group and creating a pair that belong to the created group:

```

aureplicationremote -unit unit_name -create -tce
                    -pvol lun -svol lun [ -pairname pair_name ]
                    -gno group_no
                    -remote array_id | -remotename_remote_path_name
                    [ -localreppoolno pool_no
                    -localmngdppoolno pool_no
                    -remoterreppoolno pool_no
                    -remotemngdppoolno pool_no ]
                    [ -pace prior | normal | slow ]
                    [ -nocopy ]

```

When creating a pair and adding the pair to an already created group:

```

aureplicationremote -unit unit_name -create -tce
                    -pvol lun -svol lun [ -pairname pair_name ]
                    -gname group_name
                    -remote array_id | -remotename_remote_path_name
                    [ -localreppoolno pool_no
                    -localmngdppoolno pool_no
                    -remoterreppoolno pool_no
                    -remotemngdppoolno pool_no ]
                    [ -pace prior | normal | slow ]
                    [ -nocopy ]
[ -pace prior | normal | slow ]
[ -fencelvl never | data ]
[ -nocopy ]

```

- **TCE**

- To create a new group and create a pair belonging to the group:

```

aureplicationremote -unit unit_name -create -tce
                    -pvol lun -svol lun [ -pairname pair_name ]
                    -gno group_no
                    -remote array_id
                    [ -localpoolno pool_no ]
                    -remotepoolno pool_no
                    [ -pace prior | normal | slow ]
                    [ -nocopy ]

```

- To create a pair and add the pair to an existing group:

```

aureplicationremote -unit unit_name -create -tce
                    -pvol lun -svol lun [ -pairname pair_name ]
                    -gname group_name
                    -remote array_id
                    [ -localpoolno pool_no ]
                    -remotepoolno pool_no
                    [ -pace prior | normal | slow ]
                    [ -nocopy ]

```

Options

Table 3-53: Options for aureplicationremote -create

Options	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ".", "@", or " (space)". Space in front and back of the character string is removed.
-create	Specify this option to create pairs.
-tc	Specify for TrueCopy pairs.
-tce	Specify for TCE pairs.
-tce	Specify for creating the TCE pair.
-pvol <i>lun</i>	Specify the logical unit number to be the P-VOL.
-svol <i>lun</i>	Specify the logical unit number to be the S-VOL.
-pairname <i>pair_name</i>	Specify the pair name. When this option is omitted, Navigator 2 adds the following name. ShadowImage pair: SI_LUxxxx_LUyyyy SnapShot pair: - When specifying the logical unit number the S-VOL: SS_LUxxxx_LUyyyy - When not specifying the logical unit number the S-VOL: SS_LUxxxx_LUNONE_nnnnnnnnnnnnnnn - xxxx: Logical unit number of the P-VOL (4 digits with 0), - yyyy: Logical unit number of the S-VOL (4 digits with 0) - nnnnnnnnnnnnnnnn: 14-digit optional numbers ("Year/Month/Day/hour/minute/second/millisecond" at the time of the pair creation) - pair_name: Pair name. For pair name, less than or equal to 31 ASCII characters (alphabetic characters, numerals, and the following symbols) can be used. (% , * , + , - , . , / , = , @ , _ , : , [,])
-gno <i>group_no</i>	Creates pair(s) in the specified group. When the group does not exist, a new group is created.
-gname <i>group_name</i>	Creates a pair and add it to the specified group. When the specified group already exists, created pairs add to the specified group (see note).
-remote array_id	Specify the remote array ID.
-pace prior normal slow	Specify the copy pace at the time of initial copy or restore copy. When this option is omitted, Navigator 2 sets Normal. prior: Fast normal: Medium slow: Slow
-fencelvl never data	Specify the fence level when creating a TrueCopy pair. When this option is omitted, Navigator 2 sets never.
-nocopy	Specify when not copying from the P-VOL to the S-VOL after the pair creation.
-localreppoolno pool_no	Specify the replication data DP pool number of the local array. pool_no : DP pool number

Table 3-53: Options for aureplicationremote -create (Continued)

Options	Description
-localmngdppoolno pool_no	Specify the management area DP pool number of the local array. pool_no : DP pool number
-remoterepdppoolno pool_no	Specify the replication data DP pool number of the remote array. pool_no : DP pool number.
-remoteemngdppoolno pool_no	Specify the management area DP pool number of the remote array. pool_no : DP pool number



NOTE: A pair name and group name must be less than or equal to 31 ASCII characters consisting of alphabetic characters, numerals, and the following symbols: %, *, +, -, ., /, =, @, _, :, [,].

The pair name and group name are seen in the local array only.

Returned values

- Normal termination: 0
- Abnormal termination: Other than 0

Example

```
% aureplicationremote -unit localarray -create -tce -pvol 0 -svol 0
                        -gno 0 -remote 90000002 -remotepoolno 0N/A
Are you sure you want to create pair "TCE_LU0000_LU0000"?
(y/n [n]): y
The pair has been created successfully.
%
```

Split pairs

Command name

aureplicationremote -split

Description

The aureplicationremote -split option is used to split the specified pair or all pairs in the group.

For TCE, when you split a pair, the data that is exclusive to the local side is copied when the pair split operation is performed to make the S-VOL data identical to the P-VOL data. Therefore, before the pair status changes to the Split state, the command displays the current command status. After splitting a pair, use the aureplicationmon -evtwait command to direct the aureplicationremote -split command to wait for the pair status to change to the Split status.

Syntax

- To split a pair by specifying the pair name:

```
aureplicationremote -unit unit_name -split -tc | -tc | -  
tcm  
-pairname pair_name  
-gno group_no | -gname group_name  
[ -svolrw r | rw ]
```
- To split a pair by specifying the P-VOL and S-VOL:

```
aureplicationremote -unit unit_name -split -tc | -tc | -  
tcm  
-locallun pvol  
-localvol lun -remotevol lun  
-remote array_id |  
-remotename_remote_path_name
```
- To split the pairs in a group:

```
aureplicationremote -unit unit_name -split -tc | -tc | -  
tcm  
-gno group_no | -gname group_name  
[ -svolrw r | rw ]
```

When the attribute of the local volume is the S-VOL:

- To split a pair by specifying the pair name:

```
aureplicationremote -unit unit_name -split -tc | -tc | -  
tcee  
-pairname pair_name  
-gno group_no | -gname group_name  
-svolstatusaction forcedtakeover |  
recovertakeover]
```
- To split a pair by specifying the P-VOL and S-VOL:

```
aureplicationremote -unit unit_name -split -tc | -tc | -  
tcee  
-locallun pvol  
-localvol lun -remotevol lun  
-remote array_id |  
-remotename_remote_path_name  
-svolstatusaction forcedtakeover |  
recovertakeover]
```
- To split the pairs in a group:

```
aureplicationremote -unit unit_name -split -tc | -tc | -  
tcee  
-gno group_no | -gname group_name  
-svolstatusaction forcedtakeover |  
recovertakeover]
```

Options

Table 3-54: Options for aureplicationremote -split

Options	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", "." (period)", "@", or " (space)". Space in front and back of the character string is removed.
-split	Specify this option to split pairs.
-tc	Specify for TrueCopy pairs.
-tce	Specify for TCE pairs.
-tce	Specify for TCE pairs.
-pvol <i>lun</i>	Specify the logical unit number to be the P-VOL.
-svol <i>lun</i>	Specify the logical unit number to be the S-VOL.
-pairname <i>pair_name</i>	Specify a pair name pair (see note).
-gno <i>group_no</i>	Splits pairs in the specified group. When the pair name is not specified, all pairs in the specified group are split.
-gname <i>group_name</i>	Splits pairs in the specified group. When the pair name is not specified, all pairs in the specified group are split (see note).
-remote <i>array_id</i>	Specify the array ID of the remote array.
-svolrw <i>r</i> <i>rw</i>	Specify the access limit to the S-VOL after pair split. When this option is omitted, Navigator 2 sets rw. r: Read only rw: Read/Write



NOTE: A pair name and group name must be less than or equal to 31 ASCII characters consisting of alphabetic characters, numerals, and the following symbols: %, *, +, -, ., /, =, @, _, :, [,].

Returned values

- Normal termination: 0
- Abnormal termination: Other than 0

Example

```
% aureplicationremote -unit localarray -split -tc -pairname TC_LU0000_LU0000
                        -gname TC_Group1
Are you sure you want to split pair?
(y/n [n]): y
The pair has been split successfully.
%
```

Resynchronize pairs

Command name

aureplicationremote -resync

Description

The aureplicationremote -resync option is used to resynchronize the specified pair, or pairs in a group.

Syntax

- To resynchronize a pair by specifying the pair name:
aureplicationremote -unit unit_name -resync
-tc | -tce | tce
-pairname pair_name
-gno group_no | -gname group_name
- To resynchronize a pair by specifying the P-VOL and S-VOL:
aureplicationremote -unit unit_name -resync
-tc | -tce | tce
-pvol lun -svol lun
-remote array_id
- To resynchronize the pairs in a group:
aureplicationremote -unit unit_name -resync
-tc | -tce | tce
-gno group_no | -gname group_name

Options

Table 3-55: Options for aureplicationremote -resync

Option	Description
-unit <i>unit_name</i>	Specify the array unit name. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_", ".", "@", or " " (space). Space in front and back of the character string is removed.
-resync	Specify to resynchronize pairs.
-tc	Specify for TrueCopy pairs.
-tce	Specify for TCE pairs.
-tce	Specify when resynchronizing the TCE pair.
-pvol <i>lun</i>	Specify the logical unit number to be the P-VOL.
-svol <i>lun</i>	Specify the logical unit number to be the S-VOL.
-pairname <i>pair_name</i>	Specify the pair name. When this option is omitted, all pairs in the specified group are resynchronized (see note).
-gno <i>group_no</i>	Resynchronize pairs in the specified group. When the pair name is not specified, all pairs in the specified group are resynchronized.

Table 3-55: Options for aureplicationremote -resync

Option	Description
-gname <i>group_name</i>	Resynchronize pairs in the specified group. When the pair name is not specified, all pairs in the specified group are resynchronized (see note).
-remote array_id	Specify the remote array ID.



NOTE: A pair name and group name must be less than or equal to 31 ASCII characters consisting of alphabetic characters, numerals, and the following symbols: %, *, +, -, ., /, =, @, _, :, [,].

Returned values

- Normal termination: 0
- Abnormal termination: Other than 0Example:

Example

```
% aureplicationremote -unit localarray -resync -adr -pairname
TC_LU0000_LU0000 -gname TC_Group1
Are you sure you want to re-synchronize pair?
(y/n [n]): y
The re-synchronizing of pair has been required.
%
```

Swap pairs

Command name

aureplicationremote -swaps

Description

The aureplicationremote -swaps option is used to swap a pair or pairs in the group.

Syntax

- To swap a pair for the specified pair name:
aureplicationremote -unit unit_name -swaps -tc
-pairname pair_name
-gno group_no | -gname group_name
- To swap a pair for the specified S-VOL:
aureplicationremote -unit unit_name -swaps -tc
-svol lun
- To swap the pairs in a group:
aureplicationremote -unit unit_name -swaps -tc | -tce | tce
-gno group_no | -gname group_name

Options

Table 3-56: Options for aureplicationremote -swaps

Options	Description
-unit <i>unit_name</i>	Specify the remote array unit name that swaps the pairs. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), ".", "@", or " " (space). Space in front and back of the character string is removed.
-swaps	Specify to swaps pairs.
-tc	Specify for TrueCopy pairs.
-tce	Specify for TCE pairs.
-tce	Specify for TCE pairs.
-pairname <i>pair_name</i>	Specify the pair name. When this option is omitted, all pairs which belong to the specified group are swapped (see note).
-gno <i>group_no</i>	Restore pairs that belong to the specified group. When the pair name is not specified, all pairs in the specified group are swapped.
-gname <i>group_name</i>	Restore pairs that belong to the specified group. When the pair name is not specified, all pairs in the specified group are swapped (see note).
-svol <i>lun</i>	Specify the logical unit number of the S-VOL.



NOTE: A pair name and group name must be less than or equal to 31 ASCII characters consisting of alphabetic characters, numerals, and the following symbols: %, *, +, -, ., /, =, @, _, :, [,].

Returned values

- Normal termination: 0
- Abnormal termination: Other than 0Example:

Example

```
% aureplicationremote -unit remotesarray -swaps -adr -gno 0
                        -gname TC_Group1
Are you sure you want to swap pair?
(y/n [n]): y
The swap of pair has been required.
%
```

Delete pairs

Command name

aureplicationremote -simplex

Description

The `aureplicationremote -simplex` option is used to delete the specified pair or pairs in a group.

For TCE, when deleting a pair, when you delete a pair, the data on the local side is copied when the delete operation is performed to make the S-VOL data identical with the P-VOL data. Therefore, before the pair status changes to the Simplex state, the command displays the current status. After deleting a pair, use the `aureplicationmon -evtwait` command to direct the status to change to Simplex.

For TCE, before the pair status changes to Simplex, the local differential data is copied to the S-VOL, making it identical with the P-VOL. To display status when it becomes Simplex, use the `aureplicationmon -evtwait` command (see [Monitor pair status—event wait on page 3-370](#)).

There may be cases when pair status at the remote array does not change to Simplex because of failure in the remote path. You can confirm S-VOL status after the P-VOL changes to Simplex. When executing the `-simplex` option on the remote array, the S-VOL is deleted forcibly.

When executing the `-simplex` option on the remote array before executing it on the local array, the S-VOL status changes to Simplex, but data consistency in the S-VOL is not guaranteed.

Syntax

- To delete a pair by specifying the pair name:

```
aureplicationremote -unit unit_name -simplex -tc | tce |  
-tce  
-pairname pair_name  
-gno group_no | -gname group_name
```
- To delete a pair by specifying the P-VOL and S-VOL:

```
aureplicationremote -unit unit_name -simplex -tc | -tce |  
tce  
-locallun pvol | svol  
-remote array_id
```
- To delete the pairs in a group:

```
aureplicationremote -unit unit_name -simplex -tc | -tce |  
tce  
-gno group_no | -gname group_name
```

Options

Table 3-57: Options for aureplicationremote -simplex

Options	Description
-unit <i>unit_name</i>	Specify the local array unit name that deletes the pairs. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_" (underline), ".", "@", or " " (space). Space in front and back of the character string is removed.
-simplex	Specify to release pairs.
-tc	Specify for TrueCopy pairs.
-tce	Specify for TCE pairs.
-tce	Specify for TCE pairs.
-local lun pvol svol	Specify whether the local lu is the P-VOL or S-VOL.
-pvol <i>lun</i>	Specify the logical unit number to be the P-VOL.
-svol <i>lun</i>	Specify the logical unit number to be the S-VOL.
-pairname <i>pair_name</i>	Specify the pair name. When this option is omitted, all pairs in the specified group are deleted (see note).
-gno <i>group_no</i>	Delete pairs that belong to the specified group. When the pair name is not specified, all pairs in the specified group are deleted.
-gname <i>group_name</i>	Delete pairs that belong to the specified group. When the pair name is not specified, all pairs in the specified group are deleted (see note).
-remote array id	Specify the remote array ID.



NOTE: A pair name and group name must be less than or equal to 31 ASCII characters consisting of alphabetic characters, numerals, and the following symbols: %, *, +, -, ., /, =, @, _, :, [,].

Returned values

- Normal termination: 0
- Abnormal termination: Other than 0Example:

Example

```
% aureplicationremote -unit localarray -simplex -tc -pairname TC_LU0000_LU0000
-gname TC_Group1
Are you sure you want to release pair?
(y/n [n]): y
The pair has been released successfully.
%
```


Table 3-58: Options for aureplicationremote -chg (Continued)

Options	Description
-svol <i>lun</i>	Specify the logical unit number to be the S-VOL.
-pairname <i>pair_name</i>	Specify the pair name (see note).
-gno <i>group_no</i>	Changes the pair information in the specified group.
-gname <i>group_name</i>	Changes the pair information in the specified group. *
-pace prior normal slow	Changes the copy pace to the specified pace. prior: Fast normal: Medium slow: Slow
-newgname <i>new_group_name</i>	Changes the group name to the specified new name. **
-newpairname <i>new_pair_name</i>	Changes the pair name to the specified new name (see note).
-remote array id	Specify the remote array ID.



NOTE: A pair name and group name must be less than or equal to 31 ASCII characters consisting of alphabetic characters, numerals, and the following symbols: %, *, +, -, ., /, =, @, _, :, [,].

* When specifying a pair name that doesn't belong to a group, use "Ungrouped" in the group name.

** For a new group name, do not specify "Ungrouped". An error occurs if it is specified at the time of creation.

Returned values

- Normal termination: 0
- Abnormal termination: Other than 0

Example

```
% aureplicationremote -unit localarray -chg -tc -locallun
pvol -pvol 0 -svol 0
                                -remote 90000000281000002 -newpairname
NEW_PAIR_NAME
Are you sure you want to change pair information?
(y/n [n]): y
The pair information has been changed successfully.
%
```

Monitor pair status—synchronous wait

This command is used with TCE only. It is used to check whether data written to the P-VOL is reflected in the S-VOL immediately after the command.

For the event waiting command, for all remote and local replication systems, see [Monitor pair status—event wait on page 3-370](#)

Command name

aureplicationmon -syncwait

Description

The aureplicationmon -syncwait command instructs the TCE system to display whether or not data written to the P-VOL in the specified pair or group is reflected in the S-VOL. When this command is executed, the sequence number (Q-marker) on the local array is immediately compared to the sequence number on the remote array, then at regular intervals. Because the sequence number is updated for each group, you can check whether the S-VOL data has been updated or not by executing the command specifying a group when all the pairs in the target group are in the Paired status.

Syntax

- To check whether data written to the P-VOL in the specified group is reflected in the S-VOL:

```
aureplicationmon -unit unit_name -syncwait -tce  
                  -gno group_no | -gname group_name  
                  -wait -timeout time  
                  [ -pvolsequence sequence_no ]
```
- To check whether data written to the P-VOL in the specified pair is reflected in the S-VOL:

```
aureplicationmon -unit unit_name -syncwait -tce  
                  -pairname pair_name  
                  -gno group_no | -gname group_name  
                  -wait -timeout time  
                  [ -pvolsequence sequence_no ]
```
- To display the latest sequence number of the P-VOL in the specified group.

```
aureplicationmon -unit unit_name -syncwait -tce  
                  -gno group_no | -gname group_name  
                  -nowait
```
- To display the latest sequence number of the P-VOL in the specified pair.

```
aureplicationmon -unit unit_name -syncwait -tce  
                  -pairname pair_name  
                  -gno group_no | -gname group_name  
                  -nowait
```

Options

Table 3-59: Options for aureplicationmon -syncwait

Options	Description
---------	-------------

Table 3-59: Options for aureplicationmon -syncwait

-unit <i>unit_name</i>	Specify the array unit name. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", "." (period)", "@", or " (space)". Space in front and back of the character string is removed.
-syncwait	Checks if the write is reflected in the S-VOL immediately after the command, or gets the current sequence number of the P-VOL.
-tce	Specify for TCE.
-pairname <i>pair_name</i>	Specify the pair name (see note).
-gno <i>group_no</i>	Specify the group number (see note)
-gname <i>group_name</i>	Specify the group name (see note)
-nowait	Gets the current status of the pair or the group (see Table 3-60).
-timeout <i>time</i>	Specify time-out time. When this option is omitted, the time-out time set 3 seconds. time = time-out time (0 to 180)
-pvolsequence <i>sequence_no</i>	Waits for the write data to the P-VOL with the specified sequence number to be updated to the S-VOL. The sequence number can be obtained with -nowait option. This option is used to confirm that Write data is updated to the S-VOL. When this option is omitted, the sequence number of the P-VOL at the time the command is used.



NOTE: A pair name and group name must be less than or equal to 31 ASCII characters consisting of alphabetic characters, numerals, and the following symbols: %, *, +, -, ., /, =, @, _, :, [,].

Returned values

Table 3-60: Return Values for the -nowait Parameter

	Status	Returned Values	Description
When the -nowait option is specified	NOWAIT	1	Successfully obtained the current sequence number of the P-VOL.
When the -nowait option is not specified	DONE	10	Write data to the P-VOL has been updated to the S-VOL.
	TIMEOUT	11	A timeout has occurred.
	BROKEN	12	Out of synchronization because of splitting pair, failure, etc.
	CHANGED	13	The pair has been resynchronized.

Example

```
% aureplicationmon -unit array1 -syncwait -tce -gno 0 -wait -timeout 180
Monitoring...
Status has been changed to DONE.
Number of process queue   : 976
P-VOL sequence No.       : 59652
%
```

Referencing/setting TrueCopy option

Referencing the TrueCopy option

Command name

```
autruecopyopt -refer
```

Format

```
autruecopyopt -unit unit_name -refer
```

Description

The -refer option is displays for the TrueCopy option information.

Options

Options	Description
-unit unit_name	Specify the array unit name that will be display the TrueCopy option information. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols "-", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.
-refer	Displays the TrueCopy option information.

Returned values

Normal termination: **0**

Abnormal termination: **Other than 0**

Example:

```
% autruecopyopt -unit array1 -refer
Cycle Time[sec.]           : 300
Cycle Over Report          : Disable
%
```

Setting the TrueCopy option

Command name

```
autruecopyopt -set
```

Format

To set the cycle time:

```
autruecopyopt -unit unit_name -set -cycletime time
```

To set the cycle over report:

```
autruecopyopt -unit unit_name -set -cycleoverreport enable | disable
```

Description

The `-set` option sets the TrueCopy option.

Options

Options	Description
-unit unit_name	Specify the array unit name that will be set the TrueCopy option information. Specify the name in less than or equal to 64 characters using alphanumeric characters, special symbols “- (minus)”, “_ (underline)”, “.” (period), “@”, or “ (space)”. Space in front and in the rear of the character string is removed.
-set	Sets the TrueCopy option information.
-cycletime time	Specify the cycle time. time : cycle time (second)
-cycleoverreport enable disable	Sets whether to validate or invalidate the specification of the cycle over report. enable : Enables the specification of the cycle over report disable : Disables the specification of the cycle over report

Returned values

Normal termination: **0**

Abnormal termination: **Other than 0**

Example:

```
% autruecopyopt -unit array1 -set -cycletime 300 -cycleoverreport  
enable  
Are you sure you want to set the TrueCopy options? (y/n [n]): y  
The TrueCopy options have been set successfully.  
%
```

CLI, CCI commands for remote-replication

Table 3-61: Comparison with CCI Commands

Description	CLI Command	CCI Command
Display pair information	aureplicationremote -refer	pairdisplay
Create pairs	aureplicationremote -create	paircreate
Split pairs	aureplicationremote -split	pairsplit
Resynchronize pairs	aureplicationremote -resync	pairresync
Swap pairs	aureplicationremote -swaps	pairresync -swaps
Delete pairs	aureplicationremote -simplex	pairsplit -S
Synchronous wait	aureplicationmon -syncwait	pairsynctwait

HDP CLI operations

This chapter provides procedures for performing Dynamic Provisioning operations from the command line using Navigator 2 Command Line Interface.

The following topics are covered in this chapter:

- ❑ [Installing Dynamic Provisioning](#)
- ❑ [Managing DP pools from the command line](#)
- ❑ [Managing DP-VOLs from the command line](#)
- ❑ [Managing DP pool information](#)
- ❑ [Optimizing DP](#)

Installing Dynamic Provisioning

Observe the following guidelines:

- Before installing or uninstalling Dynamic Provisioning, verify that the array is operating normally. If a failure such as a controller blockade has occurred, installation or un-installation cannot be performed.
- Confirm that the cache partition information is initialized as shown in [Installing Dynamic Provisioning and rebooting the array](#) when Dynamic Provisioning is installed in the status where Cache Partition Manager is already in use.

A key code or key file is required to install Dynamic Provisioning.

Dynamic Provisioning can be installed with or without rebooting the array.

Installing Dynamic Provisioning without rebooting

To install Dynamic Provisioning without rebooting

1. From the command prompt, register the HUS storage system in which Dynamic Provisioning is to be installed, and then connect to the array.
2. Issue the **auopt** command to install Dynamic Provisioning. An example is shown below.

Example:

```
% auopt -unit array-name -lock off -keycode manual-attached-keycode
Are you sure you want to unlock the option? (y/n [n]): y
The option is unlocked.
In order to complete the setting, it is necessary to reconfigure memory or reboot the
subsystem.

Are you sure you want to start reconfigure memory? (y/n [n]): y
While in progress, performance degradation of host I/Os to the array will occur.

Are you sure you want to continue? (y/n [n]): y
Memory reconfiguring started successfully.

%
```

3. Issue the **auopt** command to confirm whether Dynamic Provisioning has been installed. An example is shown below.

Example:

```
% auopt -unit array-name -refer
Option Name          Type    Term    Status
  Reconfigure Memory Status
D_PROVISIONING      Permanent ---    Enable
  Reconfiguring(10%)
%
```

Dynamic Provisioning has been installed and Status is **Enable**.
Confirm the **Reconfigure Memory Status** is
Reconfiguring(nn%) or **Normal**.

4. When the **Reconfigure Memory Status** is
Reconfiguring(nn%), wait awhile, then perform step 3, and
confirm the **Reconfigure Memory Status** changes to **Normal**.
5. When the **Reconfigure Memory Status** is **Failed(Code-01:Timeout)**, perform step 2.

Code-01 occurs when the access from the host is frequent or the
amount of the unwritten data in the cache memory is large.

6. When the **Reconfigure Memory Status** is **Failed(Code-02:
Failure of Reconfigure Memory)**, perform the following
reconfigure memory operation.

Code-02 occurs when the drive restoration processing starts in
the background.

Example:

```
% auopt -unit array-name -reconfigurememory start

Are you sure you want to start reconfigure memory? (y/n [n]): y
While in progress, performance degradation of host I/Os to the array will occur.

Are you sure you want to continue? (y/n [n]): y
Memory reconfiguring started successfully.

%
```

7. When the **Reconfigure Memory Status** is **Failed(Code-04:Failure of Reconfigure Memory)**, perform the following
reboot operation.

Code-03 occurs when the copy of the management information in
the cache memory fails.

Example:

```
% aureboot -unit array-name
Do you want to restart the subsystem? (y/n [n]): y
Host will be unable to access the subsystem while restarting. Host applications
that use the subsystem will terminate abnormally. Please stop host access before
you restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting b
egins.
When using Remote Replication, restarting the remote subsystem will cause both R
emote Replication paths to fail.
Remote Replication pair status will be changed to "Failure(PSUE)" when pair stat
us is "Paired(PAIR)" or "Synchronizing(COPY)". Please change Remote Replication
pair status to "Split(PSUS)" before restart.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute? (y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 6 - 25min.
The subsystem restarted successfully.
%
```

8. When the **Reconfigure Memory Status is Failed(Code-03: Failure of Reconfigure Memory)**, contact the Support Center.

Installation of Dynamic Provisioning is now complete.

Installing Dynamic Provisioning/Dynamic Tiering when Cache Partition Manager is Used

Dynamic Provisioning or Dynamic Tiering uses a part of the cache area to manage internal resources. Because of this, the cache capacity that Cache Partition Manager can use becomes smaller than the usual one.

Make sure that the cache partition information is initialized as shown below when Dynamic Provisioning or Dynamic Tiering is installed in the status where Cache Partition Manager is already in use.

- All the volumes are moved to the master partitions on the side of the default owner controller.
- All the sub-partitions are deleted and the size of each master partition is reduced to a half of the user data area after installing Dynamic Provisioning or Dynamic Tiering.

An example of the case where Cache Partition Manager is used is shown in [Figure 4-1](#).

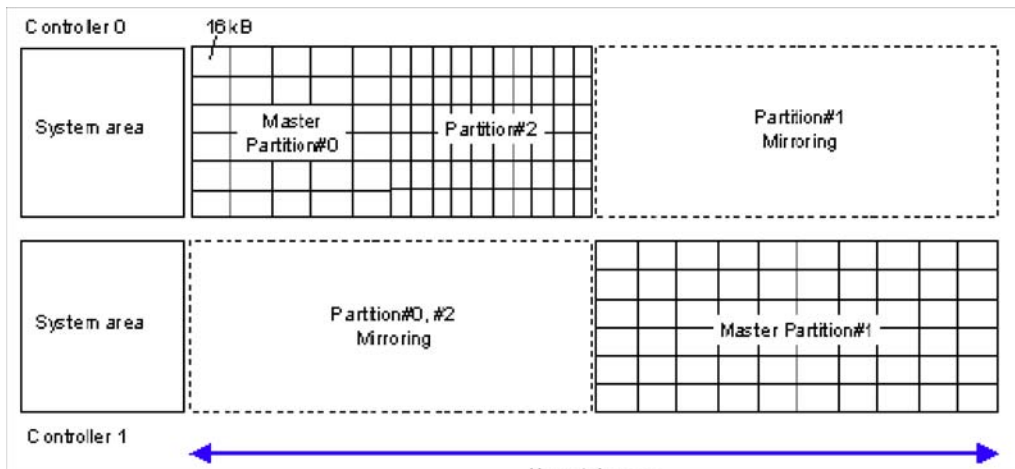


Figure 4-1: Standard case where Cache Partition Manager is used

Installing Dynamic Provisioning and rebooting the array

If Dynamic Provisioning is installed, uninstalled, or changed during a spin-down instruction using the Power Savings option, the spin down may fail. If spin-down fails, execute the spin-down again. Check that the spin-down instruction has not been issued or has been completed (no RAID group in the Power Saving Status of Normal (Command Monitoring) exists) before installing, uninstalling, or changing Dynamic Provisioning.

When you install, uninstall, enable, or disable Dynamic Provisioning when a array is used on the remote side of TrueCopy or TrueCopy Extended, the following conditions occur with the restart of the array.

- Both paths of TrueCopy or TrueCopy Extended are blocked. When a path is blocked, a TRAP occurs that notifies the SNMP Agent Support Function. The TrueCopy or TrueCopy Extended path recovers from the blockade automatically after the array restarts.
- If the pair status of TrueCopy or TrueCopy Extended is **Paired** or **Synchronizing**, it changes to **Failure**. When you restart the array, install, uninstall, enable, or disable Dynamic Provisioning after changing the pair status of TrueCopy or TrueCopy Extended to Split.



NOTE:

When the Power Saving instruction of the non I/O link is executed with the priced option, Power Saving or Power Saving Plus are used together. If Dynamic Provisioning is added, deleted, or changed while the Power Saving status is Normal (Command Monitoring), the status is changed to "Normal (Spin down Failure: PS OFF/ON)" by the array reboot which works at the time of the setting change and then the spin-down may fail.

When the spin-down fails, run a spin-down session again. Before adding, deleting, or changing the Dynamic Provisioning instance, check that the spin-down instruction has not been issued or there is no RAID group where the Power Saving status is Normal (Command Monitoring) by the Power Saving instruction of the non I/O link.

If the NAS unit is connected to the array, have the drive array administrator check whether the NAS unit is connected and NAS service is operational.

Ask the NAS unit administrator to check whether a failure has occurred by checking the NAS administration software. In case of a failure, execute the maintenance operation together with the NAS maintenance personnel.

If the NAS unit is connected, ask the NAS unit administrator for termination of NAS OS and planned shutdown of the NAS unit. After completing this operation, ask the NAS unit administrator to reboot the NAS unit.

After rebooting, have the NAS unit administrator refer to "Recovering from FC path errors" in the *Hitachi NAS Manager User's Guide* and check the status of the Fibre Channel (FC) path and to recover the FC path if it is in a failure status.

If there are personnel for the NAS unit maintenance, ask the NAS unit maintenance personnel to reboot the NAS unit.

1. From the command prompt, register the array in which Dynamic Provisioning is to be installed, and then connect to the array.
2. Issue the **auopt** command to install Dynamic Provisioning. The example is shown below.

Example:

```
% auopt -unit array-name -lock off -keycode manual-attached-keycode
Are you sure you want to unlock the option? (y/n [n]): y
The option is unlocked.
In order to complete the setting, it is necessary to reconfigure memory or reboot the
subsystem.
Are you sure you want to start reconfigure memory? (y/n [n]): n
Host will be unable to access the subsystem while restarting. Host applications
that use the subsystem will terminate abnormally. Please stop host access before
you restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting b
egins.
When using Remote Replication, restarting the remote subsystem will cause both R
emote Replication paths to fail.
Remote Replication pair status will be changed to "Failure(PSUE)" when pair stat
us is "Paired(PAIR)" or "Synchronizing(COPY)". Please change Remote Replication
pair status to "Split(PSUS)" before restart.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute? (y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 6 - 25min.
The subsystem restarted successfully.
%
```

3. Issue the **auopt** command to confirm whether Dynamic Provisioning has been installed. The example is shown below.

Example:

```
% auopt -unit array-name -refer
Option Name
Type      Term      Status
          Reconfigure Memory Status
D_PROVISIONING
Permanent ---      Enable
          Normal
%
```

Dynamic Provisioning is installed and the status is **Enable**.
Installation of Dynamic Provisioning is now complete.

Uninstalling Dynamic Provisioning

To uninstall Dynamic Provisioning, the key code provided with the optional feature is required. Once uninstalled, Dynamic Provisioning cannot be used (locked) until it is again installed using the key code or key file.

The following conditions must be satisfied in order to uninstall Dynamic Provisioning.

- When the DP-VOL is mapped, the mapping information must be released.
- All the DP-VOLs must be deleted.
- All the DP pools for Dynamic Provisioning must be deleted.

Dynamic Provisioning can be uninstalled with or without requiring the array to be rebooted.

Uninstalling without rebooting

1. From the command prompt, register the array in which Dynamic Provisioning is to be uninstalled, and then connect to the array.
2. Issue the **auopt** command to uninstall Dynamic Provisioning. The example is shown below.

Example:

```
% auopt -unit array-name -lock on -keycode manual-attached-keycode
Are you sure you want to lock the option? (y/n [n]): y
The option is locked.
In order to complete the setting, it is necessary to reconfigure memory or reboot the
subsystem.
Are you sure you want to start reconfigure memory? (y/n [n]): y
While in progress, performance degradation of host I/Os to the array will occur.
Are you sure you want to continue? (y/n [n]): y
Memory reconfiguring started successfully.
%
```

3. Issue the **auopt** command to confirm whether Dynamic Provisioning has been uninstalled. The example is shown below.

Example:

```
% auopt -unit array-name -refer
DMEC002015: No information displayed.
%
```

Uninstalling Dynamic Provisioning is now complete.

Uninstalling and rebooting the array

1. From the command prompt, register the array in which Dynamic Provisioning is to be uninstalled, and then connect to the array.
2. Issue the **auopt** command to uninstall Dynamic Provisioning. The example is shown below.

Example:

```
% auopt -unit array-name -lock on -keycode manual-attached-keycode
Are you sure you want to lock the option? (y/n [n]): y
The option is locked.
In order to complete the setting, it is necessary to reconfigure memory or reboot the
subsystem.
Are you sure you want to start reconfigure memory? (y/n [n]): n
Host will be unable to access the subsystem while restarting. Host applications
that use the subsystem will terminate abnormally. Please stop host access before
you restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting begins.
When using Remote Replication, restarting the remote subsystem will cause both Remote
Replication paths to fail.
Remote Replication pair status will be changed to "Failure(PSUE)" when pair stat
us is "Paired(PAIR)" or "Synchronizing(COPY)". Please change Remote Replication
pair status to "Split(PSUS)" before restart.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute? (y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 6 - 25min.
The subsystem restarted successfully.
%
```

3. Issue the **auopt** command to confirm whether Dynamic Provisioning has been uninstalled. The example is shown below.

Example:

```
% auopt -unit array-name -refer
DMEC002015: No information displayed.
%
```

Uninstalling Dynamic Provisioning is now complete.

Enabling or disabling Dynamic Provisioning

Dynamic Provisioning can be enabled or disabled when it is installed. You can enable or disable Dynamic Provisioning with or without booting the array.

Prerequisites for disabling Dynamic Provisioning

- When the DP-VOL is mapped, release the mapping information.
- Delete all the DP-VOLs (see [Deleting a DP-VOL from a DP pool on page 4-19](#)).
- Delete all the DP pools for Dynamic Provisioning (see [Deleting a DP pool on page 4-15](#)).

To enable or disable Dynamic Provisioning without rebooting

1. From the command prompt, register the HUS storage system in which the status of the feature is to be changed, and then connect to the array.
2. Issue the **auopt** command to change the status (enable or disable). The following is an example of changing the status from enable to disable. To change the status from disable to enable, enter **enable** after the **-st** option.

Example:

```
% auopt -unit array-name -option D_PROVISIONING -st disable
Are you sure you want to disable the option? (y/n [n]): y
The option has been set successfully.
In order to complete the setting, it is necessary to reconfigure memory or reboot the
subsystem.

Are you sure you want to start reconfigure memory? (y/n [n]): y
While in progress, performance degradation of host I/Os to the array will occur.

Are you sure you want to continue? (y/n [n]): y
Memory reconfiguring started successfully.

%
```

3. Issue the **auopt** command to confirm whether the status has been changed. An example is shown below.

Example:

```
% auopt -unit array-name -refer
Option NameType    Term    Status
      Reconfigure Memory Status
D_PROVISIONINGPermanent ---    Disable
      Reconfiguring(10%)
%
```

Enabling or disabling Dynamic Provisioning is now complete.

To enable or disable Dynamic Provisioning with rebooting the array

1. From the command prompt, register the HUS storage system in which the status of the feature is to be changed, and then connect to the array.
2. Issue the **auopt** command to change the status from enable to disable. The following is an example of changing the status from enable to disable. To change the status from disable to enable, enter **enable** after the **-st** option.

Example:

```
% auopt -unit array-name -option D_PROVISIONING -st disable
Are you sure you want to disable the option? (y/n [n]): y
The option has been set successfully.
In order to complete the setting, it is necessary to reconfigure memory or reboot the subsystem.
Are you sure you want to start reconfigure memory? (y/n [n]): n
Host will be unable to access the subsystem while restarting. Host applications that use the subsystem will terminate abnormally. Please stop host access before you restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting begins.
When using Remote Replication, restarting the remote subsystem will cause both Remote Replication paths to fail.
Remote Replication pair status will be changed to "Failure(PSUE)" when pair status is "Paired(PAIR)" or "Synchronizing(COPY)". Please change Remote Replication pair status to "Split(PSUS)" before restart.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute? (y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 6 - 25min.
The subsystem restarted successfully.
%
```

3. Issue the **auopt** command to confirm whether the status has been changed. An example is shown below.

Example:

```
% auopt -unit array-name -refer
Option NameType      Term      Status
      Reconfigure Memory Status
D_PROVISIONINGPermanent ---      Disable
      Normal
%
```

Enabling or disabling Dynamic Provisioning is now complete.

Managing DP pools from the command line

The **audppool** command operates DP pool. To refer the **audppool** command and its options, type **audppool -help** or **aman audppool** at the command prompt.

This section discusses the following topics:

- [Creating a new DP pool](#)
- [Changing DP pool thresholds](#)
- [Deleting a DP pool](#)
- [Reinitializing a DP pool](#)
- [Adding DP pool capacity](#)
- [Shrinking the DP Pool capacity](#)
- [Canceling the DP Pool Capacity Shrinking](#)

Creating a new DP pool

The time to create DP pools depends on the number and capacity of the DP pools to be created, the number and capacity of the HDUs to be added to the DP pool, etc. When creating many DP pools or adding HDUs of large capacity to the DP pool, it may take a long time to complete all the processing.

To create a DP pool

1. From the command prompt, issue the **audppool** command to create a DP pool using these settings:
 - Registered array name: HUS 130
 - DP pool number: 0
 - RAID level: 6
 - Combination: 6D+2P
 - HDU type: SAS
 - HDU capacity: 300 GB
 - HDU selection method: Auto
 - HDU number (drive count; Specify as "Combination of pools concerned x 1"): 8

- DP pool consumed capacity alert: Default settings
- Over-provisioning threshold: Default settings
- Stripe size: 64 kB (if omitting this option, the stripe size is set to 256 kB)

Example:

```
% audppool -unit HUS110 -add -dppoolno 0 -RAID6 -combination 6:2 -type SAS
  -drvcapa 300 -drive auto -drivecount 8 -notification enable -stripesize 64
The drive will be selected automatically.
Are you sure you want to set a DP pool? (y/n [n]): y
The DP pool has been set successfully.
%
```

2. Issue the **audppool** command to confirm the created DP pool.

Example of outputting items:

```
% audppool -unit HUS110 -refer -t
DP   RAID
Pool Level Total Capacity Consumed Capacity Type Status Reconstruction Progress Size
0    6( 6D+2P) 1.0 TB          0.0 TB SAS Normal N/A          64KB
%
```

Creating a DP pool is now complete. You can create a DP-VOL.

Changing DP pool thresholds

After creating a DP pool, the only DP pool attributes that can be changed are the threshold values.

To change DP pool thresholds

1. From the command prompt, issue the **audppool** command to change the DP pool attributes using these settings:
 - Registered array name: HUS110
 - DP pool number: 0
 - Depletion Alert: 50%

Example:

```
% audppool -unit HUS110 -chg -dppoolno 0 -depletion_alert 50
Are you sure you want to change the DP pool attribute? (y/n [n]): y
DP pool attribute changed successfully.
%
```

2. Issue the **audppool** command to confirm the DP pool attribute.

Example:

```

% audppool -unit HUS 110 -refer -detail -dppoolno 0 -t
DP Pool : 0
Tier Mode : N/A
RAID Level          : 6(6D+2P)
Page Size           : 32MB
Stripe Size         : 64KB
Type                : SAS
Status              : Normal
Reconstruction Progress : N/A
Capacity
  Total Capacity      : 8.0 TB
Replication Available Capacity : 8.0 TB
  Consumed Capacity   : 2.0 TB
Total                : 2.0 TB
User Data            : N/A
Replication Data      : N/A
Management Area       : N/A
  Needing Preparation Capacity
DP Pool Consumed Capacity
Current Utilization Percent : 1%
Early Alert Threshold       : 40%
Depletion Alert Threshold    : 50%
Notifications Active         : Enable
Over Provisioning
Current Over Provisioning Percent : 1%
  Warning Threshold : 100%
  Limit Threshold   : 130%
  Notifications Active : Enable
Limit Enforcement    : Disable
Replication
Current Replication Utilization Percent : N/A
Replication Depletion Alert Threshold    : N/A
Replication Data Released Threshold      : N/A
  Defined LU Count : 0
  DP RAID Group
                                Total    Consumed Utilization
DP RAID Group Tier Type Chunk Size RAID Level Capability Capacity Percent
  0      49  N/A SAS  N/A      6(6D+2P)  8.0TB    2.0TB    0%
Drive Configuration
DP RAID Group RAID Level Unit HDU Type Capacity Status
  0            6(6D+2P)  0   0   SAS  300GB Standby
  0            6(6D+2P)  0   1   SAS  300GB Standby
  :
  :
DP RAID Group Unit HDU Type Capacity Status
  0( 6D+2P)    0   0   SAS  300GB Standby
  0( 6D+2P)    0   1   SAS  300GB Standby
  :
  :
Logical Unit
                                Consumed          Stripe Cache Pair Cache          No. of
LU      Capacity Capacity Consumed % Size Partition Partition Status Paths
%

```

Deleting a DP pool

Usually only one DP pool is deleted in normal practice. However, it is possible to delete multiple DP pools at the same time, if needed.



NOTE: Before deleting a DP pool, delete all the DP-VOLs defined to the DP pool (see [Deleting a DP-VOL from a DP pool on page 4-19](#)).

To delete a DP pool

1. From the command prompt, issue the **audppool** command to delete a DP pool using these settings. To delete two or more DP pools, enter a space between a pool number.

- Registered array name: HUS 130
- DP pool number: 2

Example:

```
% audppool -unit HUS110 -rm -dppoolno 2
Are you sure you want to delete the specified DP pool(s)? (y/n [n]): y
The DP pool 2 has been deleted.
DP pool(s) have been deleted successfully.
%
```

Reinitializing a DP pool

You can recover a DP pool to reset the DP pool after a failure. This is an abnormal operation and should be performed with care. Before attempting to recover a DP pool, you should back up all important data and stop host access to the HUS storage system.

If the DP-VOL is blocked due to an HDU failure, recover the HDU in which the failure occurs. If the status of the DP-VOL is Unformat, perform the LU format.

To recover a DP pool

1. From the command prompt, issue the **audppool** command to reinitialize a DP pool using these settings:

- Registered array name: HUS130
- DP pool number: 2

Example:

```
% audppool -unit HUS110 -recover -dppoolno 2
Confirm DP pool reinitialization.
If you reinitialize the DP pool, you will not be able to recover your data.
Please backup all important data before performing this operation.
When you reinitialize a DP pool, the data becomes unusable. Systems or applications
that use this array may terminate unexpectedly. Please make sure to stop the
host access to the array before performing this operation.
Are you sure you want to reinitialize the specified DP pool? (y/n [n]): y
Start the DP pool reinitialization.
%
```

2. From the command prompt, issue the **auluref** command to confirm the DP-VOL status. Use the following settings:

- -Registered array name: HUS130

Example:

```
% auluref -unit HUS110 -g
```

LU	Capacity	Stripe Size	RAID Group	DP Pool	RAID Level	Type	Number of Paths	Status
0	100.0 GB	256KB	0	N/A	5(4D+1P)	SAS	0	Normal
1000	500.0 GB	256KB	N/A	0	6(6D+2P)	SAS	0	Unformat

```
%
```

3. From the command prompt, specify an LU whose status is displayed as Unformat, and issue the **auformat** command to format the LU. Use the following settings:

- -Registered array name: HUS110
- -Unformatted LU: 1000

Example:

```
% auformat -unit HUS110 -lu 1000
Are you sure you want to format the logical unit(s)? (y/n [n]): y
The format was started.
%
```

Adding DP pool capacity

You can grow DP pool capacity by adding DP RAID groups to the DP pool. The total amount of capacity of the DP RAID groups registered in the DP pool is the capacity of that DP pool. Monitor the free capacity of the usable DP pool, and grow the DP pool as needed.

To add DP pool capacity

From the command prompt, issue the **audppool** command to add DP pool capacity using these settings:

- Registered array name: HUS130

- DP pool number: 2
- Adding HDU number (drive count; specify as "Combination of pools concerned x 1"): 8

Example:

```
% audppool -unit HUS110 -chgsiz -dppoolno 2 -drivecount 8
Are you sure you want to add the capacity of DP pool? (y/n [n]): y
The capacity of DP pool has been added successfully.
%
```

4. To optimize the DP pool when adding DP pool capacity, specify the **-dptimize** option in the **audppool** command.

Example:

```
% audppool -unit HUS110 -chgsiz -dppoolno 2 -drivecount 8 -dptimize
Are you sure you want to add the capacity of DP pool? (y/n [n]): y
DP optimization (rebalancing) automatically executes for all logical units in
this DP pool after capacity is added.
While in progress, performance degradation of host I/Os to the array occurs.
Do you want to continue processing? (y/n [n]): y
The capacity of DP pool has been added successfully.
%
```

Shrinking the DP Pool capacity

The pool capacity is shrunk by deleting the DP RAID groups which belong to the DP pool.

To shrink the DP Pool capacity:

From the command prompt, execute the audppool command to shrink the DP Pool capacity.

Use the following settings:

- Registered array name: HUS 110
- DP Pool number: 0
- DP RAID Group to be shrunk: 99

```
% audppool -unit HUS110 -chgsiz -shrink -dppoolno 0 -dprg 99
Are you sure you want to shrink DP pool capacity? (y/n [n]): Y
The shrink DP pool capacity request has been cancelled successfully.
%
```

Canceling the DP Pool Capacity Shrinking

To cancel the shrinking of DP pool capacity:

From the command prompt, execute the audppool command to cancel the shrinking of the DP Pool capacity.

Use the following settings:

- Registered array name: HUS110
- DP pool number: 0
- DP RAID group to cancel the shrinking: 99

```
% audppool -unit HUS110 -chgsz -shrink -dppoolno 0 -dprg 99
Are you sure you want to cancel the shrink of DP pool capacity? (y/n [n]): Y
The shrink DP pool capacity request has been cancelled successfully.
%
```

Managing DP-VOLs from the command line

Use the **auluadd**, **auluref**, **auludel**, and **aulusizechg** commands to operate the DP-VOL. To refer to the commands and their options, at the command prompt, type **command name -help** or **aman command name**.

This section discusses the following topics:

- [Creating a DP-VOL](#)
- [Deleting a DP-VOL from a DP pool](#)
- [Changing DP-VOL capacity](#)

Creating a DP-VOL

To create a DP-VOL

1. From the command prompt, issue the **auluadd** command to create a DP-VOL using these settings:
 - Registered array name: HUS130
 - DP pool number: 0
 - DP-VOL capacity: 500 GB
 - LUN: 1000

Example:

```
% auluadd -unit HUS110 -lu 1000 -size 500g -dppoolno 0
Are you sure you want to set the logical unit?
(y/n [n]): y
The logical unit has been set successfully.
%
```

2. Issue the **auluref** command to confirm the DP-VOL is created.

Example:

```
% auluref -unit HUS110 -g
      Stripe RAID   DP   RAID
LU    Capacity  Size  Group Pool Level      Type  Status
1000   500.0 GB  256KB N/A    0   6( 6D+2P)  SAS   Normal
%
```

Deleting a DP-VOL from a DP pool

By deleting a DP-VOL from a DP pool, the DP pool area that the DP-VOL was using is released, increasing the free capacity of the DP pool. The areas assigned to the DP-VOL are also formatted.

To delete a DP-VOL

From the command prompt, issue the **auludel** command using the following settings:

- Registered array name: HUS130
- LUN: 1000

Example:

```
% auludel -unit HUS110 -lu 1000
The specified logical unit(s) will be deleted.
The specified logical unit(s) have already been formatted.
Are you sure you want to delete the specified logical unit(s)? (y/n [n]): y
If you delete the logical unit(s), you will not be able to recover your data, Please make
sure to perform backup of all important data before this operation.
When you delete your logical unit, the data becomes unusable. Systems or
applications that use this subsystem will terminate abnormally. Please make sure to
stop host access to the subsystem before performing this operation.
Are you sure you want to delete the specified logical unit(s)? (y/n [n]): y
The specified logical unit(s) will be deleted.
Are you sure you want to execute? (y/n [n]): y
The logical unit 1000 has been deleted.
The logical unit(s) have been deleted successfully.
%
```

Changing DP-VOL capacity

You can increase or decrease the capacity of the DP-VOL in which the HUS100 storage system is operational. The procedure to change the capacity of the DP-VOL is the same as for changing capacity for a normal LU.

To change the DP-VOL capacity

1. From the command prompt, issue the **auluchgsize** command using these settings:
 - Registered array name: HUS110
 - LUN: 1000
 - New size: 1 TB:

Example:

```
% auluchgsize -unit HUS100 -lu 1000 -size 1t
Are you sure you want to grow the logical unit?
(y/n [n]): y
The logical unit has been grown successfully.
%
```

2. To optimize the DP pool when reducing DP-VOL capacity, specify the **-dpoptimize** option in the **auluchgsize** command.

Example:

```
% auluchgsize -unit HUS110 -lu 1000 -size 500g -dpoptimize
Are you sure you want to shrink the logical unit? (y/n [n]): y
DP optimization automatically executes for this logical unit after reducing
(shrinking) logical unit capacity.
While in progress, performance degradation of host I/Os to the array occurs.
Do you want to continue processing? (y/n [n]): y
If you shrink the logical unit, you will not be able to recover your data for the
reduction. Please make sure to perform backup of all important data before this
operation.
When you shrink the logical unit, the data becomes unusable. Systems or applications
that use this array will terminate abnormally. Please make sure to stop the host access
to the array before performing this operation.
Are you sure you want to shrink the logical unit? (y/n [n]): y
The specified logical unit will be shrunk.
Are you sure you want to execute? (y/n [n]): y
The logical unit has been shrunk successfully.
%
```

3. Issue the **auluref** command to confirm the DP-VOL has been grown or shrunk.

Example:

```
% auluref -unit HUS110 -g
```

LU	Capacity	Stripe Size	RAID Group	DP Pool	RAID Level	Type	Status
1000	1024.0 GB	256KB	N/A	0	6(6D+2P)	SAS	Normal

Managing DP pool information

The **audptrend** command operates the DP pool trend information. To refer to the command and its options, at the command, type **audptrend -help** or **auman audptrend**.

This section discusses the following topics:

- [Viewing DP pool trend information](#)
- [Saving DP pool trend information to a file](#)

Viewing DP pool trend information

To view the DP pool trend information

From the command prompt, issue the **audptrend** command using these settings:

- Registered array name: HUS110
- DP pool number: 0

Example:

```
% audptrend -unit HUS130 -refer -dppoolno 0
DP Pool : 0
      Total      Consumed
Date   Capacity  Capacity
2009/03/15  63.9 TB  4095 GB
2009/03/14  63.9 TB  4095 GB
```

Saving DP pool trend information to a file

To output the DP pool trend information to a file

From the command prompt, issue the **audptrend** command using these settings:

- Registered array name: HUS110
- Array serial number: 90001234
- Output destination: C:\tmp

Example:

```
% audptrend -unit HUS110 -export -path C:\tmp
The trend of DP pool will be output to the file.
Are you sure you want to continue? (y/n [n]): y
The trend of DP pool has been outputted to the file.
Output File Name : 90001234 DPPool LU_20090316072440.CSV
Output File Name : 90001234_DPPool_Total_20090316072440.CSV
Output File Name : 90001234 DPPool_Consumed_20090316072440.CSV
%
```

When you specify the prefix for the CSV file (in this example, the prefix characters are trend201006):

```
% audptrend -unit USC110 -export -path C:\tmp -prefix trend201006
The trend of DP pool will be output to the file.
Are you sure you want to continue? (y/n [n]): y
The trend of DP pool has been outputted to the file.
Output File Name : trend201006_900000026_DPPool_LU_20100413104807.CSV
Output File Name : trend201006_900000026_DPPool_Total_20100413104807.CSV
Output File Name : trend201006_900000026_DPPool_Consumed_20100413104807.CSV
%
```

Optimizing DP

The **audpoptimize** command performs the DP pool optimization. To refer the command and its options, type **audpoptimize -help** or **auman audpoptimize** at the command prompt.

This section discusses the following topics:

- [Canceling DP optimization](#)[Checking the progress of DP optimization](#)
- [Changing optimization priority](#)

Optimizing the DP pool

To optimize the DP pool

1. From the command prompt, issue the **audpoptimize** command using these settings:
 - Registered array name: HUS150
 - DP-VOLs LUN: 2 and 3

Example:

```
% audpoptimize -unit HUS150 -start -lu 2 3
Are you sure you want to start the DP optimization? (y/n [n]): y
While in progress, performance degradation of host I/Os to the array will occur.

Do you want to continue processing? (y/n [n]): y
The DP optimization started successfully.
```

2. To reclaim the zero page, issue the **audpoptimize** command adding the **-zeropagereclaim** option.

Example:

```
% audpoptimize -unit HUS150 -start -lu 2 3 -zeropagereclaim
Are you sure you want to start the DP optimization? (y/n [n]): y
While in progress, performance degradation of host I/Os to the array will occur.

The Zero Page Reclaim option results in DP pool optimization taking longer to process.
Do you want to continue processing? (y/n [n]): y
The DP optimization started successfully.
%
```

3. To optimize all DP-VOLs, issue the **audpoptimize** command adding the **-allindppool** option. If you specify the normal LU, a command error occurs.

Example:

```
% audpoptimize -unit HUS150 -start -lu 2 3 -allindppool
Are you sure you want to start the DP optimization? (y/n [n]): y
While in progress, performance degradation of host I/Os to the array will occur.

Optimization processing will occur for all logical units in DP pools including the
specified logical units.
  LUN   DP Pool
    2     0
    3     0
Do you want to continue processing? (y/n [n]): y
The DP optimization started successfully.
```

Canceling DP optimization

To cancel the DP optimization

1. From the command prompt, issue the **audpoptimize** command adding the **-cancel** option.

Example:

```
% audpoptimize -unit HUS150 -cancel -lu 2 3
Are you sure you want to cancel the DP optimization? (y/n [n]): y
The DP optimization has been canceled successfully.
```

Checking the progress of DP optimization

To check the progress of DP optimization

1. From the command prompt, issue the **audpoptimize** command adding the **-refer** option.

```
% audpoptimize -unit HUS150 -refer
Priority : DP Optimization
DP Capacity Mode
  Current           : Regular Capacity
  User Setting      : Regular Capacity
Reconfigure Memory Status : Normal
  DP  RAID Total Consumed Reclaimable Accelerated Wide Full Anch
LUN Pool Level Capacity Capacity Capacity Status Striping Mode Capacity Mode Cap
0 0 5( 2D+1P) 5.0 GB 4.0 GB 0.0 MB Normal Disable Disable 0.0 MB
1 0 5( 2D+1P) 50.0 GB 35.0 GB 0.0 MB Normal Disable Disable 0.0 MB
2 0 5( 2D+1P) 100.0 GB 11.0 GB 0.0 MB Normal Disable Disable 896.0 MB
3 0 5( 2D+1P) 500.0 GB 101.0 GB 0.0 MB Normal Disable Disable 0.0 MB

Needing Preparation 1st Tier Reclaimable 2nd Tier Reclaimable 3rd Tier Reclaimable Auto DP Opt Auto DP Opt
Capacity Capacity Capacity Capacity Capacity Status Threshold
0.0 MB N/A N/A N/A N/A Disable N/A
0.0 MB N/A N/A N/A N/A Disable N/A
0.0 MB N/A N/A N/A N/A Disable N/A
0.0 MB N/A N/A N/A N/A Disable N/A
%
```

Changing optimization priority

To change optimization priority

1. From the command prompt, issue the **audptimize** command adding the **-chg** and **-priority** options.

Example:

```
% audptimize -unit HUS110 -chg -priority host
Are you sure you want to change the priority of DP optimization? (y/n [n]): y
The DP optimization option results in performance degradation of host I/Os to the
array while DP optimization is in progress.
Do you want to continue processing? (y/n [n]): y
The priority of DP optimization has been changed successfully.
%
```

Changing the DP Capacity Mode

To change the DP Capacity Mode:

* When changing the DP Capacity Mode by the memory reconfiguration

1. From the command prompt, execute the **audptimize** command adding the **-chg** and the **-capacitymode** options.

```
% audptimize -unit HUS150 -chg -capacitymode maximum
Are you sure you want to change the DP capacity mode? (y/n [n]): y
When Cache Partition Manager is enabled, because cache partition feature settings
goes back to a default, it is necessary to set it again.
Do you want to continue processing? (y/n [n]): y
The DP capacity mode has been changed successfully.
In order to complete the changing, it is necessary to restart the subsystem.
When not restarting, the changing will be registered, but it will not become effective
on the subsystem.
Are you sure you want to start reconfigure memory? (y/n [n]): y
While in progress, performance degradation of host I/Os to the array will occur.
Are you sure you want to continue? (y/n [n]): y
Memory reconfiguring started successfully.
%
```



NOTE: When using Cache Partition Manager, the memory reconfiguration option is not displayed because the memory reconfiguration cannot be executed.

2. From the command prompt, execute the **audptimize** command adding the **-refer** option, and confirm the Reconfigure Memory status is **Reconfiguring(nn%)** or **Normal**.

The following example displays output when using the **-refer** option.

```
% audpoptimize -unit HUS150 -refer
Priority : Normal
DP Capacity Mode
Current      : Regular Capacity
User Setting : Maximum Capacity
Reconfigure Memory Status : Reconfiguring(83%)
DP RAID      Total Consumed Reclaimable
LUN Pool Level Capacity Capacity Capacity Status
0 0 5( 2D+1P) 5.0 GB 4.0 GB 0.0 MB Normal
1 0 5( 2D+1P) 50.0 GB 35.0 GB 0.0 MB Normal
2 0 5( 2D+1P) 100.0 GB 11.0 GB 0.0 MB Normal
3 0 5( 2D+1P) 500.0 GB 101.0 GB 0.0 MB Normal
Accelerated Wide Striping Mode Full Capacity Mode Anchored Capacity
Disable Disable Disable 0.0 MB
Disable Disable Disable 0.0 MB
Disable Disable Disable 896.0 MB
Disable Disable Disable 0.0 MB

Needing Preparation 1st Tier Reclaimable 2nd Tier Reclaimable 3rd Tier Reclaimable Auto DP Optimize Auto
DP Optimize
Capacity Capacity Capacity Capacity Status Threshold
0.0 MB N/A N/A N/A Disable N/A
0.0 MB N/A N/A N/A Disable N/A
0.0 MB N/A N/A N/A Disable N/A
0.0 MB N/A N/A N/A Disable N/A

%
```

3. When the Reconfigure Memory status is Reconfiguring(nn%), execute step 2 operation after waiting for a while, and confirm the Reconfigure Memory status changes to Normal.
4. When the Reconfigure Memory Status is Failed(Code-01:Timeout), execute step 1 operation.
Code-01 occurs when the access from the host is frequent or the amount of the unwritten data in the cache memory is large.
5. When the Reconfigure Memory status is Failed(Code-02: Failure of Reconfigure Memory), execute the following reconfigure memory operation.
Code-02 occurs when the drive restoration processing starts in the background.

```
% auopt -unit array-name -reconfigurememory start
Are you sure you want to start reconfigure memory? (y/n [n]): y
While in progress, performance degradation of host I/Os to the array will occur.
Are you sure you want to continue? (y/n [n]): y
Memory reconfiguring started successfully.
```

6. When the Reconfigure Memory status is Failed(Code-04:Failure of Reconfigure Memory), execute the following reboot operation.

Code-04 occurs when the unwritten data in the cache memory cannot be saved to the drive.

```
% aureboot -unit array-name
Do you want to restart the subsystem? (y/n [n]): y
Host will be unable to access the subsystem while restarting. Host applications that
use the subsystem will terminate abnormally. Please stop host access before you
restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting begins.
When using Remote Replication, restarting the remote subsystem will cause both
Remote Replication paths to fail.
Remote Replication pair status will be changed to "Failure(PSUE)" when pair status is
"Paired(PAIR)" or "Synchronizing(COPY)". Please change Remote Replication pair
status to "Split(PSUS)" before restart.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute? (y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 7 - 25min.
The subsystem restarted successfully.
%
```

7. When the Reconfigure Memory status is Failed(Code-03: Failure of Reconfigure Memory), ask the Support Center to solve the problem.

Code-03 occurs when the copy of the management information in the cache memory fails.

8. After completing the memory reconfiguration, execute the **audptimize** command adding the **-refer** option from the command prompt.

If not changed to the set mode in the confirmation result, reconfigure the memory again. The following example displays output when using the **-refer** option.

% audpoptimize –unit HUS150 –refer											
Priority : Normal											
DP Capacity Mode											
Current			: Maximum Capacity								
User Setting			: Maximum Capacity								
Reconfigure Memory Status : Normal											
DP		RAID	Total	Consumed	Reclaimable			Accelerated	Wide	Full	Anchored
LUN	Pool	Level	Capacity	Capacity	Capacity	Status			Striping	Mode	Capacity
Mode	Capacity										
0	0	5(2D+1P)	5.0 GB	4.0 GB	0.0 MB	Normal			Disable		Disable
0.0 MB											
1	0	5(2D+1P)	50.0 GB	35.0 GB	0.0 MB	Normal			Disable		Disable
0.0 MB											
2	0	5(2D+1P)	100.0 GB	11.0 GB	0.0 MB	Normal			Disable		Disable
896.0 MB											
3	0	5(2D+1P)	500.0 GB	101.0 GB	0.0 MB	Normal			Disable		Disable
0.0 MB											
Needing Preparation			1st Tier Reclaimable		2nd Tier Reclaimable		3rd Tier Reclaimable		Auto DP Optimize		Auto
DP Optimize											
Capacity			Capacity		Capacity		Capacity		Status		Threshold
0.0 MB			N/A		N/A		N/A	Disable			N/A
0.0 MB			N/A		N/A		N/A	Disable			N/A
0.0 MB			N/A		N/A		N/A	Disable			N/A
0.0 MB			N/A		N/A		N/A	Disable			N/A
%											

* When changing the DP Capacity Mode by restarting the array

1. From the command prompt, execute the audpoptimize command adding the **-chg** and the **-capacitymode options**.

```

% audpoptimize -unit HUS150 -chg -capacitymode maximum
Are you sure you want to change the DP capacity mode? (y/n [n]): y
When Cache Partition Manager is enabled, because cache partition feature settings
goes back to a default, it is necessary to set it again.
Do you want to continue processing? (y/n [n]): y
The DP capacity mode has been changed successfully.
In order to complete the changing, it is necessary to restart the subsystem.
When not restarting, the changing will be registered, but it will not become effective
on the subsystem.
Are you sure you want to start reconfigure memory? (y/n [n]): n
Do you restart the subsystem? (y/n [n]): y
Host will be unable to access the subsystem while restarting.
Host applications that use the subsystem will terminate abnormally. Please stop host
access before you restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting begins.
When using Remote Replication, restarting the remote subsystem will cause both
Remote Replication paths to fail.
Remote Replication pair status will be changed to "Failure(PSUE)" when pair status is
"Paired(PAIR)" or "Synchronizing(COPY)". Please change Remote Replication pair
status to "Split(PSUS)" before restart.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute? (y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 7 - 25min.
The subsystem restarted successfully.
%

```



NOTE: When using Cache Partition Manager, the memory reconfiguration option is not displayed because the memory reconfiguration cannot be executed.

2. After completing the reboot of the array, execute the **audpoptimize** command adding the **-refer** option from the command prompt.

If not changed to the set mode in the confirmation result, restart the array again. The following example displays output when using the **-refer** option.

```

% audpoptimize -unit HUS150 -refer
Priority : Normal
DP Capacity Mode
Current          : Maximum Capacity
User Setting     : Maximum Capacity
Reconfigure Memory Status : Normal
DP RAID Total Consumed Reclaimable Accelerated Wide Full Anchored
LUN Pool Level Capacity Capacity Capacity Status Striping Mode Capacity Mode Capacity
0 0 5( 2D+1P) 5.0 GB 4.0 GB 0.0 MB Normal Disable Disable
0.0 MB
1 0 5( 2D+1P) 50.0 GB 35.0 GB 0.0 MB Normal Disable Disable
0.0 MB
2 0 5( 2D+1P) 100.0 GB 11.0 GB 0.0 MB Normal Disable Disable
896.0 MB
3 0 5( 2D+1P) 500.0 GB 101.0 GB 0.0 MB Normal Disable Disable
0.0 MB

Needing Preparation 1st Tier Reclaimable 2nd Tier Reclaimable 3rd Tier Reclaimable Auto DP Optimize Auto
DP Optimize
Capacity Capacity Capacity Capacity Capacity Status Threshold
0.0 MB N/A N/A N/A N/A Disable N/A
0.0 MB N/A N/A N/A N/A Disable N/A
0.0 MB N/A N/A N/A N/A Disable N/A
0.0 MB N/A N/A N/A N/A Disable N/A
%

```

Canceling Memory Reconfiguration for DP Capacity Mode Change

To cancel the memory reconfiguration:

1. From the command prompt, execute the **audpoptimize** command adding the **-reconfigurememory** option.

```

% auopt -unit array-name -reconfigurememory cancel
Are you sure you want to cancel reconfigure memory? (y/n [n]): y
Memory reconfiguring canceled successfully.
%

```



NOTE: If the memory reconfiguration proceeds to some extent and the cache memory configuration rewrite starts, the memory reconfiguration cannot be canceled. Cancellation is possible only when the rate of progress of the Reconfigure Memory Status is less than 50 percent.

Changing provisioning attributes

1. When you want to change the accelerated wide striping mode attribute, execute the `audpoptimize` command adding the **-chg** and **-widestriping** options.

Example:

```
% audpoptimize -unit HUS110 -chg -lu 0 -widestriping enable
Are you sure you want to change the Provisioning attributes? (y/n [n]): y
The Provisioning attributes has been changed successfully.
%
```

To optimize after changing the accelerated wide striping mode attributes, adding the **-dpoptimize** options.

```
% audpoptimize -unit HUS110 -chg -lu 0 -widestriping enable -dpoptimize
Are you sure you want to change the Provisioning attributes? (y/n [n]): y
The Provisioning attributes has been changed successfully.
%
```

To change the full capacity attributes, execute the **audpoptimize** command adding the **-chg** and **-fullcapacity** options.

```
% audpoptimize -unit HUS110 -chg -lu 0 -fullcapacity enable
Are you sure you want to change the Provisioning attributes? (y/n [n]): y
The Provisioning attributes has been changed successfully.
%
```

When you want to change the auto DP optimization mode, execute the **audpoptimize** command, adding the **-chg** and the **-auto** options. Furthermore, when you want to set the threshold value of auto DP optimization, enter the specified threshold value, adding the **-threshold** option.

```
% audpoptimize -unit HUS110 -chg -lu 0 -auto enable -threshold 10g
Are you sure you want to change the Provisioning attributes? (y/n [n]): y
The Provisioning attributes has been changed successfully.
%
```

When you want to change the auto DP optimization mode of all the DP volumes in the DP pool including the specified DP volume, execute the **audpoptimize** command, adding the **-allindppool** option.

```
% audpoptimize -unit HUS110 -chg -lu 0 -auto enable -threshold 10g
-allindppool
Are you sure you want to change the Provisioning attributes? (y/n [n]): y
The Provisioning attributes has been changed successfully.
%
```

CLI-based storage feature tasks

This appendix describes some basic CLI-based tasks that may be performed when using your storage features and includes the following topics:

- ☐ [Storage management features overview](#)
- ☐ [Storage features support](#)
- ☐ [Installing the storage features](#)
- ☐ [Account Authentication](#)
- ☐ [Audit Logging](#)
- ☐ [Cache Partition Manager](#)
- ☐ [Cache Residency Manager](#)
- ☐ [Data Retention Utility](#)
- ☐ [LUN Manager \(Fibre Channel\)](#)
- ☐ [Modular Volume Migration](#)
- ☐ [SNMP Agent Support Function](#)
- ☐ [Power Saving](#)
- ☐ [Power Saving Plus](#)

Storage management features overview

The storage features described in this appendix may be pre-installed and enabled, pre-installed and disabled, or require installation and enabling by providing a license key for that specific feature. These storage features may also be referred to as **Program Products** in related Hitachi Data Systems documentation. In most cases, you are required to enter the license key to activate the feature you want to use. This task is usually performed only once.

Depending on the options provided with your purchase, some of these features are provided at no charge while others may require an additional license fee to activate. Contact your sales representative if you have any questions on the storage features provided with your system.



NOTE: Some storage features described in this appendix may not be available for your product or product version. Please contact your sales representative for specific storage feature availability.

Storage features support

This chapter provides information on supported and enabled storage features for SMS 100. Note that not all features listed may be available for your system. Contact your sales representative for specific storage feature information.

Installing the storage features

Refer to the following sections on the specific CLI commands required to activate (or uninstall) the storage feature you want. Note that some selected features require a license key to enable.



NOTE: Some storage features described in this appendix may not be available for your product or product version. Please contact your sales representative for specific storage feature availability. See also the previous section regarding feature support.

Account Authentication



NOTE: Account Authentication cannot be enabled simultaneously with the Password Protection feature. You must disable Password Protection before enabling Account Authentication.

This section describes operation procedures for Account Authentication using the CLI of Storage Navigator Modular 2. The following sections are included:

- [Installing Account Authentication](#)
- [Uninstalling Account Authentication](#)
- [Displaying the account information](#)
- [Adding account information](#)
- [Changing password of the owner account information](#)
- [Changing the log in valid term](#)
- [Setting the warning banner](#)
- [Changing the Advanced Security Mode](#)
- [Forcibly logging out](#)
- [Logging in](#)
- [Setting/deleting the account information corresponding to the Script](#)

Installing Account Authentication

The following instructions describe how to install Account Authentication, using the CLI version of Storage Navigator Modular 2:



NOTE: Account Authentication cannot be used with Password Protection at the same time. When installing Account Authentication, Password Protection must be uninstalled or disabled.

1. From the command prompt, register the disk array in which Account Authentication is to be installed, and then connect to the disk array.
2. Execute the `auopt` command to install Account Authentication. The example is shown below.

```
% auopt -unit disk array-name -lock off -keycode manual-attached-keycode
Are you sure you want to install the option?
(y/n [n]): y
The option is installed successfully.
%
```

3. Execute the `auopt` command to confirm that Account Authentication has been installed. The example is shown below. Enter `root` for User ID and `storage` for Password. See the note below.

```
% auopt -unit disk array-name -refer
The Account Authentication is enabled. Please login.
User ID: root
Password:
```

Option	Name	Type	Term	Status
ACCOUNT	Permanent	---	Enable	



NOTE: Because the initial password of a built-in account can be assumed easily, be sure to change it after the installation. Also, when a password of a built-in account is lost, it cannot be returned to the initial password. Therefore, take enough care to manage the password of the built-in account.

Uninstalling Account Authentication

Follow the instructions below to uninstall Account Authentication. When it is uninstalled, Account Authentication is not available (locked) until it is installed by the key code or key file.

- To uninstall Account Authentication, the key code provided with the Account Authentication feature is required.
- Follow the instructions below to uninstall Account Authentication.



NOTE: The un-installation can be operated only with the account assigned to the role of an Account Administrator (View and Modify). When the un-installation is executed, all the accounts that have been logged in excluding the own account are forced into log out. The un-installation cannot be executed when the forced log out of all users is not completed. After the un-installation is executed, all the account information excluding the initial password of the built-in account is deleted.

1. From the command prompt, connect to the disk array in which you will uninstall Account Authentication.
2. Execute the `auopt` command to uninstall Account Authentication. The example is shown below.

```
% auopt -unit disk array-name -lock on -keycode manual-attached-keycode
User ID: root
Password:
Are you sure you want to de-install the option?
(y/n [n]): y
The option is de-installed successfully.
%
```

3. Execute the `auopt` command to confirm whether Account Authentication has been uninstalled. The example is shown below.

```
% auopt -unit disk array-name -refer
DMEC002015: No information displayed.
%
```

Uninstalling Account Authentication is now complete.

Enabling / disabling

Account Authentication feature can be set to Disable or Enable depending on the conditions in which the feature has been installed.

The following paragraphs describe a CLI procedure for setting the feature to Disable or Enable while Account Authentication feature stays in an installed state.



NOTE: Setting the function to disable or enable can be operated only with the account assigned to the role of an Account Administrator (View and Modify). When the function to disable or enable is executed, all the accounts that have been logged in excluding the own account are forced into log out. The un-installation cannot be executed when the forced log out of all users is not completed.

1. From the command prompt, connect to the disk array in which you will set Account Authentication.
2. Execute the `auopt` command to change the status (enable or disable).
3. The following is an example of changing the status from enable to disable. If you want to change the status from disable to enable, enter enable after the `-st` option.

```
% auopt -unit disk array-name -option ACCOUNT -st disable
The Account Authentication is enabled. Please login.
User ID: root
Password:
Are you sure you want to disable the option? (y/n [n]): y
The option has been set successfully.
%
```

4. Execute the `auopt` command to confirm whether the status has been changed. The example is shown below.

```
% auopt -unit disk array-name -refer
Option NameType      Term      Status
ACCOUNTPermanent ---      Disable
%
```

Enabling or disabling Account Authentication is now complete.

Displaying the account information

To display the account information:



NOTE: This operation can be operated only with the account assigned to the role of an Account Administrator (View and Modify) or an Account Administrator (View Only).

1. From the command prompt, connect to the disk array in which you will display account information.
2. Execute the `auaccount` command to display account authentication information. The example is shown below.

```
% auaccount -unit disk array-name -refer
The Account Authentication is enabled. Please login.
User ID: root
Password: root-password
User ID: root
Account Type: Built-in
Account Enable/Disable: Enable
Session Count: 1
Update Permission: Allowed
Role: Account Administrator (View and Modify)

User ID: User001
```

```
Account Type: Public
Account Enable/Disable: Disable
Session Count: 0
Update Permission: ---
Role: Storage Administrator (View and Modify)
%
```

Adding account information

To add the account information:



NOTE: This operation can be operated only with the account assigned to the role of an Account Administrator (View and Modify). Immediately after the installation of the Account Authentication function, log in with the built-in account and add the account information.

When adding the account information, it is required to register an optional user ID and a password. It is recommended to register character strings that are hard to be assumed as the user ID and the password.

It is prescribed in the standard ISO/IEC 17799 (BS 7799) to avoid to use the following character strings as far as possible because they are especially easy to be assumed.

Built_in_user, Admin, Administrator, Administrators, root, Authentication, Authentications, Guest, Guests, Anyone, Everyone, System, Maintenance, Developer, and Supervisor.



NOTE: It is recommended that a user who uses an account should log in and change the password immediately after creation of the account (that is because it is possible that an account creator remembers the initial password and logs in illegally).

When monitoring the failure via Storage Navigator Modular 2, because the failure monitoring cannot be applied to the disk array that is a target of the Account Authentication unless it is logged in, register the common user ID and the password for the monitoring to be used at the time of the failure monitoring. It is required to create the user ID and the password for the failure monitoring beforehand for each of the disk array for which the Account Authentication has been validated.

1. From the command prompt, connect to the disk array in which you will add account information.
2. Execute the `auaccount` command to add the account authentication information. The example is shown below.

```
% auaccount -unit disk array-name -add -uid User001 -account disable -rolepattern 000001
The Account Authentication is enabled. Please login.
User ID: root
Password: root-password
Assigned role
Storage Administrator (View and Modify)
Are you sure you want to add the account?
(y/n [n]): y
```

```
Please input password.  
Password: User001-password  
Re-enter Password: User001-password  
The account has been added.  
%
```

The role pattern value (-rolepattern) is as follows.

```
100000: Audit Log Administrator (View Only)  
010000: Audit Log Administrator (View and Modify)  
001000: Account Administrator (View Only)  
000100: Account Administrator (View and Modify)  
000010: Storage Administrator (View Only)  
000001: Storage Administrator (View and Modify)
```

Example: When the role pattern is assigned **Account Administrator (View and Modify)** and **Storage Administrator (View and Modify)**, specify 000101.



NOTE: When using “!”, “#”, “\$”, “&”, “'”, “*”, “?”, “\”, “{”, “|”, or “~” for the -uid option, set the file by using the -uidfile option. When “!”, “#”, “\$”, “&”, “'”, “*”, “?”, “\”, “{”, “|”, or “~” is used for the -uid option, the command may terminate abnormally or the illegal user ID may be set.

Modifying the account information

You can modify the following information:

- Password
- Role assignment
- Account enable/disable

This operation can be operated only with the account assigned to the role of an Account Administrator (View and Modify).

The procedure for modifying the account information to be explained here can be executed for an account of the other user. The own account information cannot be modified. However, the built-in account can modify the own account information.

The account information that has been modified is applied to the following log in of the account concerned.

The public account cannot modify the built-in account information.

Either user ID of the public account and the built-in account cannot be changed.

When using “!”, “#”, “\$”, “&”, “'”, “*”, “?”, “\”, “{”, “|”, or “~” for the -uid option, set the file by using the -uidfile option.

To modify the account information:

1. From the command prompt, connect to the disk array in which you will modify account information.
2. Execute the auaccount command to modify the account authentication information. The example is shown below.

```
% auaccount -unit disk array-name -chg -uid User001 -account enable -rolepattern 000101
The Account Authentication is enabled. Please login.
User ID: root
Password: root-password
Assigned role before a change
  Storage Administrator (View and Modify)
Assigned role after a change
  Storage Administrator (View and Modify)
  Account Administrator (View and Modify)
Are you sure you want to change the account?
(y/n [n]): y
The account information has been changed.
%
```

Deleting the account information

To delete the account information:



NOTE: When using “!”, “#”, “\$”, “&”, “'”, “*”, “?”, “\`, “{”, “|”, or “~” for the `-uid` option, set the file by using the `-uidfile` option.

This operation can be operated only with the account assigned to the role of an Account Administrator (View and Modify).

The own and built-in account information cannot be deleted. When a user account that has been logged in is deleted, the user is immediately forced into log out.

1. From the command prompt, connect to the disk array in which you will delete account information.
2. Execute the `auaccount` command to delete the account authentication information. The example is shown below.

```
% auaccount -unit disk array-name -rm -uid User001
The Account Authentication is enabled. Please login.
User ID: root
Password: root-password
Are you sure you want to delete [User001]?
(y/n [n]): y
If you will delete the logged in user account, user is logged out. Do you want t
o continue processing?
(y/n [n]): y
The account has been deleted.
%
```

Changing password of the owner account information

To change the password is as follows.

1. From the command prompt, connect to the disk array in which you will change account information.
2. Execute the `auaccount` command to change the owner password. The example is shown below.

```
% auaccount -unit disk array-name -chgownpwd
The Account Authentication is enabled. Please login.
User ID: root
Password: root-password
Are you sure you want to change the password?
(y/n [n]): y
Please input password.
Old Password: old-root-password
New Password: new-root-password
Re-enter Password: new-root-password
The password has been changed.
%
```

Changing the log in valid term

This operation can be operated only with the account assigned to the role of an Account Administrator (View and Modify) or an Account Administrator (View Only). To change the log in valid term:

1. From the command prompt, connect to the disk array in which you will change the log in valid term.
2. Execute the `auaccountopt` command to change the log in valid term. The example is shown below.

```
% auaccountopt -unit disk array-name -set -timeout 20
The Account Authentication is enabled. Please login.
User ID: root
Password: root-password
Are you sure you want to set the account option?
(y/n [n]): y
The account option has been set successfully.
%
```

Setting the warning banner

The warning banner set here is registered in the disk array independently of the Storage Navigator Modular 2 GUI.

To set a warning banner:

1. From the command prompt, connect to the disk array in which you will set a warning banner.
2. Execute the `auaccountopt` command to set a warning banner. The example is shown below.

```
% auaccountopt -unit disk array-name -set -bannerfile c:\banner.txt
The Account Authentication is enabled. Please login.
User ID: root
Password: root-password
Are you sure you want to set the account option?
(y/n [n]): y
The account option has been set successfully.
%
```

```
% auaccountopt -unit disk array-name -refer
The Account Authentication is enabled. Please login.
User ID: root
Password: root-password
Banner : Valid
Warning Notice!
```

This is a {Company Name Here} computer system, which may be accessed and used only for authorized {Company Name Here} business by authorized personnel. Unauthorized access or use of this computer system may subject violators to criminal, civil, and/or administrative action.

```
All information on this computer system may be intercepted, recorded, read, copied, and disclosed by and to authorized personnel for official purposes, including criminal investigations. Such information includes sensitive data encrypted to comply with confidentiality and privacy requirements. Access or use of this computer system by any person, whether authorized or unauthorized, constitutes consent to these terms. There is no right of privacy in this system.
%
```

Changing the Advanced Security Mode

To change the Advanced Security Mode:

1. From the command prompt, connect to the disk array in which you will change the Advanced Security Mode.
2. Execute the `auaccountopt` command to change the Advanced Security Mode. The example is shown below.

```
% auaccountopt -unit disk array-name -set -advancedsecuritymode enable
The Account Authentication is enabled. Please login.
User ID: root
```

```

Password: root-password
Are you sure you want to set the account option? (y/n [n]): y
The account option has been set successfully.
%

```

Setting an external authentication server

The external authentication server is set. You can set the external authentication server that supports the RADIUS protocol to the external authentication server to be set here.

1. From the command prompt, connect to the disk array in which you will set an external authentication server.
2. Execute the `auexternalauth` command to set an external authentication server. The example is shown below.

For the port number of the external authentication server, 1821 is generally used.

```

% auexternalauth -unit disk array-name -set -user_auth RADIUS
                  -srv1_addr external authentication server IP address
                  -srv1_portnum external authentication server port number
                  -srv1_auth_protocol PAP
The Account Authentication is enabled. Please login.
User ID: root
Password: root-password
Are you sure you want to set the external authentication server?
(y/n [n]): y
Please input shared secret of server 1.
Shared Secret: shared-secret
Re-enter Shared Secret: shared-secret
The external authentication server has been set successfully.
%

```

Note the following two limitations for setting an external authentication server:

- When using the RADIUS server as the external authentication server, the user ID can be no more than 253 characters. The password can be no more than 128 characters. Since there is a case where the user ID length and the password length may differ depending on the external authentication server, check the specifications of the external authentication server to be used in advance.
- When using the external authentication server to authenticate users, if the communication with the external authentication server fails, you cannot log in to the server. Make sure the communication connection to the external authentication server is active before attempting to configure it.

Changing the external authentication server

To change the setting of the external authentication server:

1. From the command prompt, connect to the disk array in which you will change the setting of the external authentication server.
2. Execute the `auexternalauth` command to change the setting of the external authentication server. The example is shown below.

```

% auexternalauth -unit disk array-name -chg -user_auth RADIUS
                  -srv1_addr external authentication server IP address
                  -srv1_portnum external authentication server port number
                  -srv1_auth_protocol PAP
                  -srv1_sharedsecret
The Account Authentication is enabled. Please login.

```

```

User ID: root
Password: root-password
Are you sure you want to change the external authentication server?
(y/n [n]): y
Please input shared secret of server 1.
Shared Secret: shared-secret
Re-enter Shared Secret: shared-secret
The external authentication server has been changed successfully.
%

```

Deleting the external authentication server

To delete the setting of the external authentication server:

1. From the command prompt, connect to the disk array in which you will delete the setting of the external authentication server.
2. Execute the
3. `auexternalauth` command to delete the setting of the external authentication server. The example is shown below.

```

% auexternalauth -unit disk array-name -rm -srv1
The Account Authentication is enabled. Please login.
User ID: root
Password: root-password
Are you sure you want to delete the external authentication server?
(y/n [n]): y
The external authentication server has been deleted successfully.
%

```

Forcibly logging out

The forced logout forcibly logs out other users except the built-in account that logs in the disk array.

When a failure occurs in the controller of the disk array during a log in of an account, a session ID being logged in may remain in the disk array. Therefore, when a controller failure occurs, log out by force all the accounts with the remaining session IDs among the accounts to which the roles of the Account Administrator (View and Modify) are assigned. The account that has been forced into log out becomes invalid. The account concerned cannot be logged in again unless the account is validated using the account to which the Account Administrator (View and Modify) role is assigned. When using "!", "#", "\$", "&", "'", "*", "?", "\", "{", "|", or "~" for the `-uid` option, set the file by using the `-uidfile` option.

1. From the command prompt, connect to the disk array in which you will forcibly log out.
2. Execute the `auaccount` command to log out forcibly. The example is shown below.

```

% auaccount -unit disk array-name -forcelogout -uid User001
The Account Authentication is enabled. Please login.
User ID: root
Password: root-password
Are you sure you want to force logout of [User001]?
(y/n [n]): y
When the user is using the array, the user cannot continue the operation.
The account is disabled and cannot login from the next time.
Do you want to continue processing? (y/n [n]): y
The force logout of [User001] has been completed.
%

```

Logging in

When a log in cannot be performed following the procedure explained in this appendix although the account has been registered, contact a user who manages the account of the Account Administrator (View and Modify) role. (It is possible that the user ID or password is incorrect or the account has been invalidated through a forced log out.)

1. For example, you specify the `aurgref` command, disk array requires User ID and its password, enter User ID and its password. See following example.

```
% aurgref -unit disk array-name
The Account Authentication is enabled. Please login.
User ID: User001
Password: User001-password
RAID RAID Parity
Group Level Groups Type Total Capacity Free Capacity Reconstruction
Priority Status Progress
0 6( 9D+2P)1 SATA 8635318272 blocks 8614305792 block( 9
9.8%) RAID Group Expansion Normal N/A
%
```

Changing Advanced Security Mode

When you change the Advanced Security Mode, the following information will be deleted or initialized:

- All logged-in sessions. The logged-in account will log out.
- All public accounts registered to the storage system.
- The roles and password of the built-in account.

You can only change Advanced Security Mode using a built-in account.

To change Advanced Security Mode

1. From the command prompt, connect to the storage system to which you will change the Advanced Security Mode.
2. Execute the `auaccountopt` command to change the Advanced Security Mode.

```
% auaccountopt -unit disk array-name -set -timeout 20
The Account Authentication is enabled. Please login.
User ID: root
Password: root-password
Are you sure you want to set the account option? (y/n [n]): y
The account option has been set successfully.
%
```

Setting/deleting the account information corresponding to the Script

When using “!”, “#”, “\$”, “&”, “'”, “*”, “?”, “\”, “{”, “|”, or “~” for the `-uid` option, set the file by using the `-uidfile` option. When “!”, “#”, “\$”, “&”, “'”, “*”, “?”, “\”, “{”, “|”, or “~” is used for the `-uid` option, the command may terminate abnormally or the illegal user ID may be set.

1. From the command prompt, connect to the disk array in which the account information is to be set or delete.
2. Execute the `auaccountenv` command to set or delete the account information. The example is shown below.

```
% auaccountenv -set -uid User001
Are you sure you want to set the account information? (y/n [n]): y
Please input password.
Password: User001-password
The account information has been set successfully.
%
% auaccountenv -rm
Are you sure you want to delete the account information? (y/n [n]): y
The account information has been deleted successfully.
%
```

3. Set Storage Navigator Modular 2 environment variable. By setting the environment variable here, the script operation that uses the set account information becomes possible.

- When making it valid by the limitation in the script to be executed, it is defined at the head of the script.
- When Account Authentication is Enabled:

```
STONAVM_ACT=on
```

The input request for the user ID and password of Account Authentication is executed with the user ID and password set with the `auaccountenv` command by setting the `STONAVM_ACT` environment variable to “on”.

```
STONAVM_RSP_PASS=on
```

All the input requests for checking a command are responded with “y” by setting the `STONAVM_RSP_PASS` environment variable to “on”.

For Windows

```
% set STONAVM_ACT=on
% set STONAVM_RSP_PASS=on
```

For Windows

```
% set STONAVM_ACT=on
% set STONAVM_RSP_PASS=on
```

For Red Hat Linux and UNIX (C shell)

```
% setenv STONAVM_ACT=on
% setenv STONAVM_RSP_PASS=on
```

When Account Authentication is Disabled:

```
STONAVM_RSP_PASS=on
```

All the input requests for checking a command are responded with “y” by setting the STONAVM_RSP_PASS environment variable to “on”.

For Windows:

```
% set STONAVM_RSP_PASS=on
```

For Red Hat Linux and UNIX (C shell):

```
% setenv STONAVM_RSP_PASS=on
```

Confirming account information for other arrays

In addition, you can confirm whether account information which was set by using the `auaccountenv` command can be used for some arrays. A series of sample steps shows how you can perform this task.

The first step sets account information using the `auaccountenv` command.

```
% auaccountenv -set -uid User001 -authentication -unit Array1
Are you sure you want to set the account information? (y/n [n]): y
Please input password.
Password: User001-password
Unit Name                      Result
Array1                         Succeed
Are you sure you want to set the account information? (y/n [n]): y
The account information has been set successfully.
%
```

The second step specifies selected storage systems, “Array1” and “Array2”.

```
% auaccountenv -set -uid User001 -authentication -unit Array1 Array2
Are you sure you want to set the account information? (y/n [n]): y
Please input password.
Password: User001-password
Unit Name                      Result
Array1                         Succeed
Array2                         Succeed
Are you sure you want to set the account information? (y/n [n]): y
The account information has been set successfully.
%
```

The following step assumes you did not specify a storage system. Then confirm account information for all storage systems registered with Navigator 2.

```
% auaccountenv -set -uid User001 -authentication
Are you sure you want to set the account information? (y/n [n]): y
Please input password.
Password: User001-password
Unit Name                      Result
Array1                         Succeed
Array2                         Succeed
Array3                         Succeed
Are you sure you want to set the account information? (y/n [n]): y
The account information has been set successfully.
%
```

The following step assumes you configured account information for specified storage systems.

```
% auaccountenv -test -authentication -unit Array1
Are you sure you want to test for account information? (y/n [n]): y
Unit Name      Result
Array1         Succeed
%
```

The following step assumes you specified storage systems, “Array1” and “Array2”.

```
% auaccountenv -test -authentication -unit Array1 Array2
Are you sure you want to test for account information? (y/n [n]): y
Unit Name      Result
Array1         Succeed
Array2         Succeed
```

When you do not specify a storage system, you can confirm the lack of an entity for all storage systems registered with Navigator 2 as show in the following step.

```
% auaccountenv -test -authentication
Are you sure you want to test for account information? (y/n [n]): y
Unit Name      Result
Array1         Succeed
Array2         Succeed
Array3         Succeed
%
```

Audit Logging

This section describes operation procedures for Audit Logging using the CLI of Storage Navigator Modular 2. The following sections are included:

- [Installing](#)
- [Enabling/disabling](#)
- [Setting the Syslog server information](#)
- [Exporting the internal logged data](#)
- [Initializing the internal logged data](#)
- [Audit Log format and output code information](#)
- [Audit log setting example](#)

Installing

Audit Logging feature is usually not selected (locked); to make it available, you must install Audit Logging feature and make its functions selectable (unlocked). **To install this function, the key code or key file provided with the optional feature is required.**

Follow the instructions below to install Audit Logging feature. Audit Logging is installed and uninstalled using Storage Navigator Modular 2.



NOTE: Installing, uninstalling, enabling, and disabling of Audit Logging feature are set for each disk array. Before installing and uninstalling, make sure that the disk array is in normal operating condition. If a failure such as a controller blockade has occurred, installation and un-installation operations cannot be performed.

The following instructions describe how to install Audit Logging, using the CLI version of Storage Navigator Modular 2:

1. From the command prompt, register the disk array in which you will install Audit Logging feature. Connect to the disk array.
2. Install the optional feature by using the following:

```
% auopt -unit array-name -lock off -licensefile license_file_path\license_file_name
```

No. Option Name

1 Audit Logging

Please specify the number of the option to unlock.
When you unlock the two or more options, partition the numbers, which are given in the list, with the space(s). When you unlock all options, input 'all'. Input 'q', then break.
The number of the option to unlock. (number/all/q [all]): 1

Are you sure you want to unlock the option?

(y/n [n]): y

Option Name

Result

```

Audit Logging                                Unlock

The process was completed.

% auopt -unit disk array-name -refer
Option Name      Type      Term      Status
      Reconfigure Memory Status
AUDIT-LOGGING    Permanent --- Enable
N/A

```

Audit Logging is installed and the status is “Enable”. Installation of Audit Logging is now complete.

Uninstalling

Follow the instructions below to uninstall Audit Logging. When it is uninstalled, Audit Logging is not available (locked) until it is installed by the key code or key file.

To uninstall Audit Logging, the key code provided with the Audit Logging feature is required.

Follow the instructions below to uninstall Audit Logging.

1. From the command prompt, connect the disk array in which you will uninstall Audit Logging feature.
2. Uninstall the optional features by using the following:

```

% auopt -unit array-name -lock on -keycode 48 chracters key code

Are you sure you want to lock the option?

(y/n [n]): y

The option is locked.
%

% auopt -unit array-name -refer
DMEC002015: No information displayed.
%

```

Enabling / disabling

Audit Logging feature can be set to Disable or Enable depending on the conditions in which the feature has been installed.

The following paragraphs describe a CLI procedure for setting the feature to Disable or Enable while Audit Logging feature stays in an installed state.

1. From the command prompt, connect the disk array in which you will change the status of Audit Logging feature.
2. Execute the auopt command to change the status (enable or disable) of Audit Logging feature.

The following is an example of how to change the status from enable to disable. To change the status from disable to enable, enter enable after the `-st` option.

```

% auopt -unit array-name -option AUDIT-LOGGING -st disable
Are you sure you want to disable the option?
(y/n [n]): y
The option has been set successfully.
%

```

3. Execute the `auopt` command to verify that Audit Logging feature status has changed.

```
% auopt -unit disk array-name -refer
Option Name      Type      Term      Status
Reconfigure Memory Status
PASSWD-PROTECT Permanent --- Enable
N/A
SNMP-AGENT       Permanent --- Enable
N/A
LUN-MANAGER      Permanent --- Enable
N/A
PFM-MONITOR      Permanent --- Enable
N/A
AUDIT-LOGGING    Permanent --- Disable
N/A
ACCOUNT          Permanent --- Disable
N/A
```

Setting the Syslog server information

When Account Authentication is valid, you can only operate an account with an Audit Log Administrator (View and Modify) role is assigned. The CLI operation to set the Syslog server information with Storage Navigator Modular 2 is as follows.

1. From the command prompt, connect the disk array in which you want to set Syslog server information.
2. Execute the `audit log` command to specify the Syslog server information with an IP address of syslog server 1: 192.168.100.100

```
% auauditlog -unit array-name -set -syslogsrv enable -srvladdr
192.168.100.100 -srv2 disable
Are you sure you want to set the audit logging information?
(y/n [n]): y
The audit logging information has been set successfully.
%
```

3. Specify as follows when checking the information to be displayed.

```
% auauditlog -unit disk array-name -refer
Syslog Server Transfer : Enable
Server      IP Address
1 Enable    192.168.100.100
2 Disable    0.0.0.0
Internal Log : Enable
%
```

Exporting the internal logged data

When Account Authentication is valid, you can only operate an account with an Audit Log Administrator (View and Modify) role is assigned. The CLI operation to output the internal logged data with Storage Navigator Modular 2 is as follows.

```
% auauditlog -unit disk array-name -export
The internal log is exported to audit\syslog_91100100.txt.
Do you want to continue processing? (y/n [n]): y
The export of internal log may affect the host access. In some cases,
performance deterioration or time-out occurs.
Do you want to continue processing? (y/n [n]): y
The internal log has been exported successfully.
%
```

Initializing the internal logged data

When Account Authentication is valid, you can only operate with an account that has an Audit Log Administrator (View and Modify) role assigned to it. The CLI operation to initialize the internal logged data with Storage Navigator Modular 2 is as follows.

```
% auauditlog -unit disk array-name -init
Are you sure you want to initialize the internal log? (y/n [n]): y
If you initialize the internal log, all logs will be deleted. You cannot
recover
the deleted internal log. Please export internal log before this operation.
Are you sure you want to initialize the internal log? (y/n [n]): y
The internal log will be initialized.
Are you sure you want to execute? (y/n [n]): y
The internal log has been initialized successfully.
%
```

Miscellaneous Audit Logging Feature Information

When the log stored inside the disk array is initialized, all the logs stored are deleted. When the log is initialized, it cannot be restored. When the log stored inside the disk array is valide, it cannot be innitialized. Make the log stored inside the disk array invalid, and then initialize it.

The following sections provide additional details on the Audit Logging storage feature.

Audit Log format and ouput code information

The log format of Audit Logging conforms to the format used in the Hitachi storage security products.

Log data output:

<u>14 Nov 22 11:10:42 192.168.100.10 Storage: CELFSS,1,123456,,2005-11-22T11:10:40.0+09:00,Storage,</u>									
1	2	3	4	5	6	7	9	10	
<u>192.168.100.10,Authentication,Success,uid=Hitachi_storage_admin,DF800:850012345,,,,,</u>									
11	12	13	14		15				
<u>from=192.168.100.200,,to=192.168.100.10,2000,,,,3EB70100 Account User Login</u>									
21	23		24	28					

The following table provides information how the audit log output is organized:

Table A-1: Audit Log Output Items

No.	Item	Priority	Explanation
1	PRI	Priority	The priority is output by the following formula. Priority = 8 Facility + Severity Facility is 1 (fixed). 3: Error (indicating that the operation has ended abnormally) 4: Warning (indicating that the operation has partly ended abnormally) 6: Informational (indicating that the operation has ended normally) For example, 14 is output for priority when severity is informational.
2	Header	Date, time	The date and time is output in the format of "MMM DD hh:mm:ss" (MMM: month, DD: day, hh: hour, mm: minute and ss: second). Note: When output the date in the format of DD, the date is output after a blank if the date is 1 digit. Example: " 1" is output for the 1 st .
3		Detected location	The IP address is output.
4	MSG/ TAG	Program (process) name	The program (process) name that created log message is output as Storage.
5	MSG/ Contents	Common specification identification information of Hitachi storage security	The common specification identification character is output as CELFSS.
6	MSG/ Contents		The revision number of the common specification document is output as 1.
7	MSG/ Contents	Message identification information	The serial number of the syslog header information is output. Note: When the disk array is rebooted, the sequential numbers to be output and those that have been output before the reboot will be out of order. Be careful that orders of the sequential numbers and logs that are output do not match.
8	MSG/ Contents		Message ID (not output because it is not used)
9	MSG/ Contents	Date, time, time difference	The date, time and the time difference between UTC (Coordinated Universal Time) is output in the format of "YYYY-MM-DD-Thh:mm:ss.0 ± hh:mm" (YYYY: year, MM: month, DD: day, hh: hour, mm: minute, ss.0: second, hh: hours of the time difference and mm: minute of the time difference) "+00:00" is output when there is no time difference between UTC, such as "20011-12-26T:23:06:58.0+00:00". Note: The output format for second "ss.0" indicates that it is output to one decimal place.
10	MSG/ Contents	Detection entity	The detection entity identification character is output as Storage.
11	MSG/ Contents	Detected location	The IP address is output.

Table A-1: Audit Log Output Items (Continued)

No.	Item	Priority	Explanation
12	MSG/ Contents	Type of audit event	The category name of the event is output. The category name and the example of the event are described below. StartStop: Disk array power on or disk array power off Authentication: Success/failure of authentication of the accounting function AccessControl: An operation outside the authority of the role (The rejection is collected as a piece of log data) and exporting audit logged data ConfigurationAccess: Setting operations
13	MSG/ Contents	Result of the audit event	The result of the audit event is output as follows. Success: The event has ended successfully. Failed: The event has ended abnormally. Occurred: Occurrence of an audit event
14	MSG/ Contents	Subject identification information	The log is output with a prefix added corresponding to the audit event. The prefix is "uid=", "wwn=", "iSN=", or "system". uid=: Denotes user ID (by management I/F event). wwn=: Denotes World Wide Name (by Fibre event) iSN=: Denotes iSCSI Name (by iSCSI event) system: Denotes disk array (by disk array event) When Account Authentication is invalid or uninstalled, only a prefix is output.
15	MSG/ Contents	Hardware identification information	The ID (HUS) to identify the model name of the product and the serial number divided by a colon (:), is output.
16	MSG/ Contents	Generated location information	Not output because it is not used.
17	MSG/ Contents	Related information	The location identification name (not output because it is not used)
18	MSG/ Contents		FQDN (not output because it is not used)
19	MSG/ Contents		Redundant identification information (not output because it is not used)
20	MSG/ Contents	Agent information	Not output because it is not used.

Table A-1: Audit Log Output Items (Continued)

No.	Item	Priority	Explanation
21	MSG/ Contents	Detailed information	Host which sent the request
22	MSG/ Contents		Port which sent the request (not output because it is not used).
23	MSG/ Contents		Host which the request is sent to
24	MSG/ Contents		Port which the request is sent to
25	MSG/ Contents		Collective operation identification number (not output because it is not used)
26			Reserve #1 (not output because it is not used)
27			Reserve #2 (not output because it is not used)
28			A highly readable sentence is output, which shows details, an object and parameters of the management operation, and a reason why the event is audited. For more information, refer to the following section.

Audit Log entry information

This section provides details on the codes and other information used in the audit log entries.

A message that is output in the detailed information in #28 of the previous section table is shown below. Note the following:

- The shaded parts are items to be operated by the service personnel.
- There are some items (which are annotated in the explanations in) of which no parameter is output on the specific conditions. In this case, the symbol # is output. Conditions of this symbol are described as an explanation of the note at the end of the following table.
- For the parameters that a user does not specify, 0 (zero) may be the output value. Also, values that were specified before may be the output.

Table A-2: Audit Log Entry Details

Code	Message	Explanation
31000100	Create LU[*1] AssignedSize=*2Blocks Type=*3 AcceleratedWideStripingMode=*4 FullCapacityMode=*5 Promotion=*6 Tier=*7 <MonitoredIO: Read=*8 Write=*9> Disabling Tier=*10	Creating a logical unit *1 LU number *2 Assigned size [Optional character string Rest of] *3 Type [RG DP] *4 Accelerated wide striping mode (Note 13) [Enable Disable] *5 Full Capacity Mode (Note 13) [Enable Disable] *6 Promptly Promotion Mode (Note 21) [Enable Disable] *7 New Page Assignment Tier (Note 21)[Middle High Low] *8 Monitored I/O (Read) (Note 21) [Enable Disable] *9 Monitored I/O (Write) (Note 21) [Enable Disable] *10 DisablingTier Relocation (Note 21) [Enable Disable]
31000200	Delete LU[*1] Type=*2	Deleting a logical unit *1 LU number *2 Type [RG DP]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
31000300	Grow LU[*1] AssignMode=*2 NewAssignedSize=*3Blocks Type=*4	Growing a logical unit *1 LU number *2 Method to set [Manual Auto] *3 Capacity [Optional character string Rest of] *4 Type [RG DP]
31000400	Shrink LU[*1] NewAssignedSize=*2Blocks Type=*3 OptimizingDP=*4	Shrinking a logical unit *1 LU number *2 Capacity [Optional character string] *3 Type [RG DP] *4 Optimizing of the DP pool [Yes No]
31000500	Add DMLU Capacity[*1] NewAllocatedSize=*2BlocksRG=*3	Adding a DMLU capacity *1 LU number *2 Capacity [Optional character string] *3 RAID group number
32000100	Set Drive Maintenance: Function=*1 <Location Unit[*2] HDU[*3]>	Setting of maintenance function of drive *1 Maintenance function of drive [Detach DataReconstruction CopyBack DynamicSparing SystemCopy] *2 Unit number *3 HDU number

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
35000100	Set Auto Detach Condition: <WarningInfo OCCUR=*1 RECV=*2 STAT=*3 Mode=*4> <OnlineVerifyTest=*5 SkipVerify=*6 CacheVerify=*7> <DriveResponseDiagnosis=*8 SATA=*9 Response=*10times> <SATA WriteandCompare=*11 Mode=*12>	Setting of warning report mode to the host *1 Report occurrence of warning to the host [Enable Disable] *2 Report recovery of warning to the host [Enable Disable] *3 Report over of statistics threshold to the host [Enable Disable] *4 Warning Information Report Mode [Port LogicalUnit] Setting of verify *5 Online Verify Test [Enable Disable] *6 Skip Verify [ON OFF] *7 Online Cache Verify [Enable Disable] Setting of Drive Response Diagnosis *8 Drive Response Diagnosis (Note 1) [Disable Enable(Output Message only) Enable(Output Message and Dynamic Sparing)] *9 SATA Drive Diagnosis (Note 1) [ON OFF] *10 Diagnosis Criterion (Difference in response time of each drive) (Note 1) [1.5 2 4 8] *11 SATA Write & Compare [Enable Disable] *12 SATA Write & Compare Mode [Full Normal]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
36000100	Set Restore Options: Mode1=*1 Mode2=*2 Time=*3*10ms Size=*4*128blocks Sparing=*5 Operation=*6	Setting of drive restoration options *1 Drive Restoration Mode [Background Interleave(Normal) Interleave(Prior)] *2 Drive Restoration [Manual Auto] *3 Interval Time *4 Processing Unit Size *5 Dynamic Sparing [Execute(Read/Write & Online Verify) Execute(Read/Write) DoNotExecute] *6 Spare Drive Operation Mode [Variable Fixed]
3A000100	Create RAID Group[*1]	Definition a RAID group *1 RAID group number
3A000200	Delete RAID Group[*1]	Deleting the RAID group *1 RAID group number
3A000300	Delete All RAID Groups	Deleting the all RAID group
3B000100	Set Threshold/LAN: ThresholdErrors Mech[*1/*2] R/W[*3/*4] Drive I/F[*5/*6] CTL[*7/*8] SCSI_I/F[*9/*10]	Setting the threshold value for preventive maintenance *1 Recovered mechanical errors *2 Un-recovered mechanical errors *3 Recovered Read/Write errors *4 Un-recovered Read/Write errors *5 Recovered Drive I/F errors *6 Un-recovered Drive I/F errors *7 Recovered Controller hard errors *8 Un-recovered Controller hard errors *9 Recovered SCSI I/F errors *10 Un-recovered SCSI I/F errors
3C000100	Modify Cache Residency settings: <CTL0=*1 LU[*2]> <CTL1=*1 LU[*2]>	Setting a Cache Residency LU *1 Residency Mode [Enable Disable] *2 LU number (Note 2)

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E0301 00	Set Boot Options: Startup=*1 Delay=*2 Detach=*3 VendorID=*4 ProductID=*5 ROM=*6 RAM=*7	Setting the Boot Options *1 System Startup Attribute [SingleMode DualActive Mode] *2 Delay Planned Shutdown time *3 Drive Detach Mode [Enable Disable] *4 Vendor ID *5 Product ID *6 ROM Micro program Version *7 RAM Micro program Version
3E0601 00	Set SNMP Information	Setting the SNMP information
3E0C01 00	Login (Password Protection)	Logged in with Password Protection user ID
3E0C02 00	Logout (Password Protection)	Log out already logged in with Password Protection user ID
3E0C03 00	Reset UserID (Password Protection)	Clearing logged in status with Password Protection user ID
3E0C04 00	Register UserID (Password Protection)	Registering a Password Protection user ID
3E0C05 00	Delete UserID (Password Protection)	Deleting the Password Protection user ID
3E1101 00	Set Spare Drives: Unit[*1] HDU[*2]	Setting the spare drives *1 Unit number *2 HDU number
3E1102 00	Release Spare Drives: Unit[*1] HDU[*2]	Releasing the spare drives *1 Unit number *2 HDU number
3E1103 00	Release Spare Drives: The drives exist in the unmounted trays	Releasing the spare drives after removing trays
3E1301 00	Set RTC [20YY/MM/DD hh:mm:ss]	Setting a RTC information (YY: year, MM: month, DD: day, hh: hour, mm: minute, ss: second)

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E1B0100	Create Local Pair: CopyType=ShadowImage PairName=*1 P-VOL=*2 S-VOL=*3 GroupNumber=*4 CopyPace=*5 Mode=*6 SecondaryNoRead=*7 MU=*8	ShadowImage pair creating (Note 3) *1 Pair name *2 P-VOL number *3 S-VOL number *4 CTG number *5 Copy pace [Fast Medium Slow] *6 Copy mode [CopySkip InitialCopy] *7 S-VOL read mode [Read NoRead] *8 MU number
3E1B0200	Create Local Pair: CopyType=SnapShot PairName=*1 P-VOL=*2 S-VOL=*3 GroupNumber=*4 DPPool=Replication[*5]/Management[*6] CopyPace=*7 MU=*8	SnapShot pair creating (Note 3) *1 Pair name *2 P-VOL number *3 S-VOL number *4 CTG number *5 DP pool number for replication data [Optional character string AUTO] *6 DP pool number for management area [Optional character string AUTO] *7 Copy pace [Fast Medium Slow] MU=*8
3E1B0300	Create Remote Pair: CopyType=TrueCopy PairName=*1 P-VOL=*2 S-VOL=*3 RemoteArraySerialNumber=*4 GroupNumber=*5 CopyPace=*6 Mode=*7 FenceLevel=*8	TrueCopy pair creating (Note 3) *1 Pair name *2 P-VOL number *3 S-VOL number *4 Remote array serial number *5 CTG number *6 Copy pace [Fast Medium Slow] *7 Copy mode [CopySkip InitialCopy] *8 Fence level [Never Data]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E1B0400	Create Remote Pair: CopyType=TrueCopyExtendedDistance PairName=*1 P-VOL=*2 S-VOL=*3 RemoteArraySerialNumber=*4 GroupNumber=*5 LocalDPPool=Replication[*6]/Management[*7] RemoteDPPool=Replication[*8]/Management[*9] RemoteDataPool=*10 CopyPace=*11 Mode=*12	TrueCopy Extended Distance pair creating (Note 3) *1 Pair name *2 P-VOL number *3 S-VOL number *4 Remote array serial number *5 CTG number *6 Local DP pool number for replication data [Optional character string AUTO] *7 Local DP pool number for management area [Optional character string AUTO] *8 Remote DP pool number for oreplication data [Optional character string [AUTO]](Note 16) *9 Remote DP pool number for management area [Optional character string AUTO]](Note 16) *8 Copy pace [Fast Medium Slow] *9 Copy mode [CopySkip InitialCopy] *10 Remote data pool number (Note 17) *11 Copy pace [Fast Medium Slow] *12 Copy mode [CopySkip InitialCopy]
3E1B0500	*1: CopyType=ShadowImage P-VOL=*2 S-VOL=*3 GroupNumber=*4 CopyPace=*5 Mode=*6	ShadowImage resynchronize/restore a pair *1 Operation mode [Resync Local Pair Restore Local Pair] *2 P-VOL number *3 S-VOL number *4 CTG number *5 Copy pace [Fast Medium Slow] *6 Mode [Normal Quick]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E1B0600	*1: CopyType=SnapShot PairName=*2 P-VOL=*3 S-VOL=*4 GroupNumber=*5 CopyPace=*6	SnapShot resynchronize/restore a pair *1 Operation mode [Resync Local Pair Restore Local Pair] *2 Pair name *3 P-VOL number *4 S-VOL number *5 CTG number [Optional character string\Ungrouped] *6 Copy pace [Fast Medium Slow]
3E1B0700	*1: CopyType=TrueCopy P-VOL=*2 S-VOL=*3 RemoteArraySerialNumber=*4 GroupNumber=# CopyPace=*5 SyncCTGMode=*6	TrueCopy resynchronize/restore a pair *1 Operation mode [Resync Remote Pair Resync-SWAP Remote Pair] *2 P-VOL number *3 S-VOL number *4 Remote array serial number *5 Copy pace [Fast Medium Slow] *6 Sync CTG mode [NoSyncCTG SyncCTG]
3E1B0800	*1: CopyType=TrueCopyExtendedDistance P-VOL=*2 S-VOL=*3 RemoteArraySerialNumber=*4 GroupNumber=# CopyPace=*5 ResumeUnit=*6	TrueCopy Extended Distance resynchronize/restore a pair *1 Operation mode [Resync Remote Pair Resync-SWAP Remote Pair] *2 P-VOL number *3 S-VOL number *4 Remote array serial number *5 Copy pace [Fast Medium Slow] *6 Resume scope [Group Volume]
3E1C0100	Split Local Pair: CopyType=ShadowImage P-VOL=*1 S-VOL=*2 SuspendUnit=*3 Discription=*4 Mode=*5	Split a ShadowImage pair *1 P-VOL number *2 S-VOL number *3 Suspend scope [Group Volume] *4 Character string for split *5 Split status [Normal Forcing Quick]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E1C0200	Split Local Pair: CopyType=SnapShot PairName= *1 P-VOL= *2 S-VOL= *3 GroupNumber= *4 SuspendUnit= *5 Discription= *6	Split a SnapShot pair *1 Pair *2 P-VOL number *3 S-VOL number *4 CTG number [Optional character string ungrouped] *5 Suspend scope [Group Volume] *6 Character string for split
3E1C0300	Split Remote Pair: CopyType=TrueCopy P-VOL= *1 S-VOL= *2 RemoteArraySerialNumber= *3 SuspendUnit= *4 S-VOLAccessibility= *5 Mode= *6	Split a TrueCopy pair *1 P-VOL number *2 S-VOL number *3 Remote array serial number *4 Split scope [Group Volume] *5 S-VOL accessibility [ReadOnly Read/Write] *6 Split status [Normal Forcing]
3E1C0400	Split Remote Pair: CopyType=TrueCopyExtendedDistance P-VOL= *1 S-VOL= *2 RemoteArraySerialNumber= *3 SuspendUnit= *4 S-VOLAccessibility= *5 Mode= *6	Split a TrueCopy Extended Distance pair *1 P-VOL number *2 S-VOL number *3 Remote array serial number *4 Split scope [Group Volume] *5 S-VOL accessibility [ReadOnly Read/Write] *6 Split status [Normal Forcing]
3E1C0500	Split after Create Local Pair: CopyType=ShadowImage PairName= *1 P-VOL= *2 S-VOL= *3 CopyPace= *4 SecondaryNoRead= *5 Mode= *6 MU= *7	Split after ShadowImage pair crating *1 Pair name *2 P-VOL number *3 S-VOL number *4 Copy pace [Fast Medium Slow] *5 S-VOL accessibility [Read NoRead] *6 Mode [NormalQuick] *7 MU number

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E1C0600	Split after Create Local Pair: CopyType=SnapShot PairName= *1 P-VOL= *2 S-VOL= *3 CopyPace= *4 DPPool=Replication[*5]/Management[*6] MU= *7	Split after SnapShot pair crating *1 Pair name *2 P-VOL number *3 S-VOL number *4 Copy pace [Fast Medium Slow] *5 DP pool number for replication data [Optional character string AUTO] *6 DP pool number for management area [Optional character string AUTO] *7 MU number
3E1D0100	Delete Pair: CopyType= *1 P-VOL= *2 S-VOL= *3 PairName= *4 GroupNumber= *5	Deleting a pair (ShadowImage/SnapShot) *1 Copy class [ShadowImage SnapShot] *2 P-VOL number *3 S-VOL number *4 Pair name *5 CTG number [Optional character string Ungrouped]
3E1D0200	Delete Pair: CopyType=TrueCopy RequestDevices= *1 RequestTarget= *2 P-VOL= *3 S-VOL= *4 RemoteArraySerialNumber= *5	Deleting a TrueCopy pair *1 Request devices [M-VOL R-VOL] *2 Request target [LU Group] *3 P-VOL number *4 S-VOL number *5 Remote array serial number M-VOL means P-VOL and S-VOL R-VOL means S-VOL
3E1D0300	Delete Pair: CopyType=TrueCopyExtendedDistance RequestDevices= *1 RequestTarget= *2 P-VOL= *3 S-VOL= *4 RemoteArraySerialNumber= *5	Deleting a TrueCopy Extended Distance pair *1 Request devices [M-VOL R-VOL] *2 Request target [LU Group] *3 P-VOL number *4 S-VOL number *5 Remote array serial number M-VOL means P-VOL and S-VOL R-VOL means S-VOL

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E2001 00	Set Command Devices LU[*1]	Setting a Command Devices *1 LU number
3E2002 00	Release Command Devices LU[*1]	Releasing the Command Devices *1 LU number
3E2003 00	Set RAID Manager Protect for Command Devices LU[*1]	Setting the RAID Manager Protect function *1 LU number
3E2201 00	Unify MainLU[*1] and SubLU[*2]	Unifying LUs (Note 3) *1 MainLU number *2 SubLU number
3E2202 00	Separate SubLU from MainLU[*1]	Separating all unified LUs *1 MainLU number
3E2203 00	Separate SubLU[*1] from MainLU[*2] (Last LU Separation)	Separating the last LU from the unified LU (Note 4) *1 SubLU number *2 MainLU number
3E2401 00	Set Remote Path: SerialNumber=*1 Bandwidth=*2Mbps RemotePathName=*3 <Path0 LocalPort*4 RemotePort*5> <Path1 LocalPort*6 RemotePort*7>	Setting a remote path information of TrueCopy/TrueCopy Extended Distance (FC) *1 Remote array serial number *2 Bandwidth *3 Remote path name *4 Local port number of path 0 *5 Remote port number of path 0 *6 Local port number of path 1 *7 Remote port number of path 1
3E2402 00	Delete Remote Path: SerialNumber=*1	Deleting the remote path information *1 Remote array serial number
3E2403 00	Recover Remote Path: Path=*1 SerialNumber=*2	Recovery the remote path *1 Path number [0 1] *2 Remote array serial number
3E2405 00	Set Remote Path: SerialNumber=*1 Bandwidth=*2Mbps RemotePathName=*3	Changing the bandwidth and remote path name of the remote path *1 Remote array serial number *2 Bandwidth *3 Remote path name

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E240600	Set Remote Path: SerialNumber=*1 Bandwidth=*2Mbps Secret=*3 RemotePathName=*4 <Path0 LocalPort*5 RemoteIP=*6 RemoteLanPort*7> <Path1 LocalPort*8 RemoteIP=*9 RemoteLanPort*10>	Setting a remote path information of TrueCopy/TrueCopy Extended (iSCSI) *1 Remote array serial number *2 Bandwidth *3 Setting of secret [Enable Disable] *4 Remote path name *5 Local port number of path 0 *6 Remote IP address of path 0 *7 Remote port number of path 0 *8 Local port number of path 1 *9 Remote IP address of path 1 *10 Remote port number of path 1
3E240700	Set Distributed Mode: *1	Setting a Distributed mode of TrueCopy/TrueCopy Modular Distributed *1 Distributed mode [Hub Edge]
3E350100	Set Host Group	Setting a host group information

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E390100	Set System Parameter P/LAN P Port Number: WN=*1 URES=*2 AUREC=*3 WTHR=*4 SHAD_IO=*5 CACHEX=*6 DETACH=*7 DETACH_TH=*8 BAT_CH=*9 OP_FAIL=*10 Title=*11 C0_WV=*12 C1_WV=*13 C0_NonSP=*14 C1_NonSP=*15 C0_NonSPNum=*16 C1_NonSPNum=*17 C0_SPNum=*18 C1_SPNum=*19	Setting the system parameters online *1 Turbo LU Warning [ON OFF] *2 Write Unique Response Mode [ON OFF] *3 Auto Reconstruction Mode [ON OFF] *4 Forced Write Through Mode [ON OFF] *5 ShadowImage I/O Switch Mode [ON OFF] *6 Synchronize Cache Execution Mode [ON OFF] *7 Drive Detach Mode [ON OFF] *8 Lower Drive Detach Threshold Mode [ON OFF] *9 Battery Charging Write Command[Write Through Write Back] *10 Operation if the Processor failures Occurs [ResetTheFault ShutdownTheSystem] *11 Web Title *12 CTL0 Write & Verify Execution Mode (Note 5) [ON OFF] *13 CTL1 Write & Verify Execution Mode [ON OFF] Setting a LAN port number *14 CTL0 (LAN normal port open/close status) [Enable Disable] *15 CTL1 (LAN normal port open/close status) [Enable Disable] (Note 5) *16 CTL0 (LAN normal port number) *17 CTL1 (LAN normal port number) (Note 5) *18 CTL0 (LAN secure port number) *19 CTL0 (LAN secure port number) (Note 5)

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E3A0100	Set Tuning Parameter(System): Opportunity=*1% StopOpportunity=*2% Cache=*3 Trace=*4 LoadBalancing=*5 MonitoringPeriod=*6minutes DirtyDataFlushNumberLimit=*7 LoadReductionforChgCnf=*8 XCOPYLowSpeed=*9	Setting the system tuning parameters *1 Dirty Data Opportunity *2 Dirty Data Stop Opportunity *3 Cache Control Mode [FIFO LRU] *4 Detailed Trace Mode [ON OFF] *5 Load balancing [ON OFF] *6 Load balancing monitoring time *8 Load Reduction for Changing Configuration Model[Enable Disable] *9 Extended COPY Low-Speed Mode [Enable Disable]
3E3A0200	Default Tuning Parameter(System)	Default setting of the system tuning parameters
3E3D0100	Set Data Pool: Pool=*1 Threshold=*2% LU[*3]	Setting a Data Pool threshold (Note 3) *1 Pool number *2 Threshold value *3 LU number
3E3D0200	Delete All LUs from Data Pool: Pool=*1	Deleting the all LUs from Data Pool *1 Pool number
3E3E0100	Set SnapShot Logical Units LU[*1]: size[*2]	Creating SnapShot logical unit of P-VOL *1 LU number *2 Capacity (unit: blocks)
3E3E0200	Delete SnapShot Logical Units LU[*1]	Deleting SnapShot logical unit of P-VOL *1 LU number
3E3F0100	Set Data Retention: LU[*1] Attribute=*2 S-VOL=*3 Term=*4day(s)	Setting the access level of LU *1 LU number *2 Access level (attribute) [Read/Write ReadOnly Protect] *3 S-VOL [Enable Disable] *4 Retention term (infinite: -)

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E3F02 00	Set Data Retention: ExpirationLock=*1	Setting the Expiration Lock *1 Expiration lock [ON OFF]
3E4101 00	Set Performance Statistics: Port=*1 RG_DP_LU=*2 Cache=*3 Processor=*4 Drive=*5 Drive_OP=*6 Backend=*7 Manage=*8	Setting the collection of performance statistics *1 Port information [ON OFF] *2 RAID Group/DP Pool/ Logical Unit information [ON OFF] *3 Cache information [ON OFF] *4 Processor information [ON OFF] *5 Drive information [ON OFF] *6 Drive operating information [ON OFF] *7 Back-end information [ON OFF] *8 Hierarchical management information [ON OFF]
3E4601 00	Format LU[*1]	Formatting of a LU *1 LU number
3E4602 00	Set Format Mode: Priority=*1 FormatData=*2	Setting the format mode *1 Format priority mode (Note 8) [Normal Host Format] *2 Format data (Note 8) [Default]
3E4801 00	Change SATA Options: SMART=*1 Threshold=*2%	Setting the SATA drive options *1 SMART function [Enable Disable] *2 Threshold of reassign mount (Note 6)
3E4901 00	Set SATA Restore Options:CorrectionCopyMagnification=*time(s)	Setting the SATA drive restore options *1 Correction copy mount
3E4A01 00	Set Remote Path(System Upgrade): SerialNumber=*1	Setting a remote array serial number of TrueCopy or TCE *1 Remote array serial number
3E4B01 00	Start Parity Correction: LU[*1]	Specifying starting of parity correction *1 LU number
3E4B02 00	Skip Parity Correction: LU[*1]	Specifying skip of parity correction *1 LU number

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E4B03 00	Cancel Parity Correction: LU[*1]	Specifying stop of parity correction *1 LU number
3E5201 00	Change LU Mapping Guard	Changing of the mapping guard setting
3E5501 00	Install: *1 UserRegistrationWizard=*2	Installing the priced option *1 The priced option name (Note 19) *2 User Registration Wizard [Start NotStart]
3E5502 00	De-install: *1	Uninstalling the priced option *1 The priced option name (Note 19)
3E5503 00	Enable: *1 UserRegistrationWizard=*2	Validation of a priced option *1 The priced option name *2 User Registration Wizard [Start NotStart]
3E5504 00	Disable: *1	Invalidation of a priced option *1 The priced option name
3E5505 00	Reconfigure Memory	Specifying the memory reconfiguring
3E5506 00	Cancel Reconfigure	Canceling the memory reconfiguring
3E5701 00	Automatic Download Mode: ENCMicro=*1 DriveFirmware=*2 AirFiltertimer=*3 PowerInterlockMode=*4 DPCapacityMode=*5	Setting of the options *1 ENC Micro [Enable Disable] *2 Drive Firmware [Enable Disable] * Air Filter Timer [Enable Disable Reset] *4 Power Interlock Mode [Standard Remote UPS 1 UPS2 UPS3] *5 DP Capacity Mode [Regular Capacity Maximum Capacity]
3E6201 00	Set DM-LU: LU[*1]	Setting the DM-LU *1 LU number
3E6202 00	Release DM-LU: LU[*1]	Releasing the DM-LU *1 LU number
3E6301 00	Set Cache Partition	Registering the Cache Partition information

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E640100	Assign Cache Partition LU	Registering the LU to the Cache Partition assignment
3E6C0100	Default Tuning Parameter(Multi Stream/Prefetch)	Default setting of the multi stream tuning parameters
3E6C0200	Set Tuning Parameter(Multi Stream/Prefetch)	Setting the multi stream tuning parameters
3E710100	Set Maintenance LAN: CTL0 IPv4= *1 IPv6= *2	Setting the IP address of maintenance port *1 IPv4 address *2 IPv6 add
3E750100	Set LAN: <CTL0 ObtainAdd= *1 IPv4= *2 Subnet= *3 Gateway= *4 ObtainAdd= *5 IPv6= *6 Subnet= *7 Gateway= *8 Negotiation= *9> <CTL1 ObtainAdd= *1 IPv4= *2 Subnet= *3 Gateway= *4 ObtainAdd= *5 IPv6= *6 Subnet= *7 Gateway= *8 Negotiation= *9> AUTO_CHNG= *10	Setting the LAN information of user's management port (Note 7) *1 Setting method of IPv4 address [DHCP Manual] *2 IPv4 address *3 Subnet mask *4 IPv4 default gateway address *5 Setting method of IPv6 address [DHCP Manual] *6 IPv6 address *7 Subnet prefix *8 IPv6 default gateway address *9 Negotiation mode [Auto 10Mbps/Half 10Mbps/Full 100Mbps/Half 100Mbps/Full 1Gbps/Full] *10 Maintenance port IP address automatic change mode [Enable Disable]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E760100	Set LAN Information: <CTL0 ObtainAdd=*1 IPv4=*2 Subnet=*3 Gateway=*4 ObtainAdd=*5 IPv6=*6 Subnet=*7 Gateway=*8 Negotiation=*9> <CTL1 ObtainAdd=*1 IPv4=*2 Subnet=*3 Gateway=*4 ObtainAdd=*5 IPv6=*6 Subnet=*7 Gateway=*8 Negotiation=*9> AUTO_CHNG=*10	Setting the LAN information of user's management port by the constitution file (Note 7) *1 Setting method of IPv4 address [DHCP Manual] *2 IPv4 address *3 Subnet mask *4 IPv4 default gateway address *5 Setting method of IPv6 address [DHCP Manual] *6 IPv6 address *7 Subnet prefix *8 IPv6 default gateway address *9 Negotiation mode [Auto 10Mbps/Half 10Mbps/Full 100Mbps/Half 100Mbps/Full 1Gbps/Full] *10 Maintenance port IP address automatic change mode [Enable Disable]
3E830100	Change Host Group Security/WWN information	Setting the host group security mode enable or disable/setting the WWN information.

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E8D01 00	Set iSCSI Port:Set iSCSI Port: Port *1 <IPv4: IP=*2 Subnet=*3 Gateway=*4> <IPv6 *5: Link IP=*6 Global IP1=*7 IP2=*8 Gateway=*9> Port=*10 *11sec MTU=*12bytes VLAN=*13 H_Digest=*14 D_Digest=*15	Setting the LAN information of iSCSI ports *1 Port number [0A 0B 0E 0F 1A 1B 1E 1F] *2 IPv4 address *3 IPv4 subnet mask *4 IPv4 default gateway address *5 IPv6 flag [Enabled Disabled] *6 IPv6 link local address (Note 18) *7 IPv6 address 1 (Note 18) *8 IPv6 address 2 (Note 18) *9 IPv6 default gateway address (Note 18) *10 Port number of TCP/ IP *11 Keep Alive time *12 MTU (Maximum Transmission Unit) [1500 4500 9000] *13 VLAN ID (Note 1) *14 Header Digest [Enabled Disabled] *15 Data Digest [Enabled Disabled]
3E8E01 00	Change CHAP User Settings: Port*1	Setting the iSCSI CHAP User information *1 Port number [0A 0B 1A 1B]
3E9001 00	Set Target Information(iSCSI): Port*1	Setting the iSCSI target information *1 Port number [0A 0B 1A 1B]
3E9101 00	Set iSNS Server: <Port0A Server=*1 IP=*2 Port=*3> <Port0B Server=*1 IP=*2 Port=*3> <Port1A Server=*1 IP=*2 Port=*3> <Port1B Server=*1 IP=*2 Port=*3>	Setting the iSNS server information (Note 12) *1 Whether to use the iSNS server or not [ON OFF] *2 IP address (Note 9) *3 Port number of TCP/ IP (Note 9)
3E9201 00	Send Ping	Sending ping

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E9301 00	Set Initiator Information(iSCSI): Port*1	Setting the iSCSI initiator information *1 Port number [0A 0B 0E 0F 1A 1B 1E 1F]
3E9401 00	Modify Port Options	Setting the port options by the constitution file
3E9501 00	Set LU Mapping	Setting the mapping information of LUs or batch setting the mapping information of LUs per port (by the constitution file)
3E9701 00	Start Volume Migration: P-VOL[*1] S-VOL[*2] CopyPace= *3	Starting Volume Migration (Note 3) *1 P-VOL number *2 S-VOL number *3 Copy pace [Prior Normal Slow]
3E9702 00	Cancel Volume Migration: P-VOL[*1] S-VOL[*2]	Terminating Volume Migration *1 P-VOL number *2 S-VOL number
3E9703 00	Split the Pair(Volume Migration): P-VOL[*1] S-VOL[*2]	Releasing a pair of Volume Migration *1 P-VOL number *2 S-VOL number
3E9704 00	Change Copy Pace for Volume Migration: CopyPace= *1 P-VOL[*2] S-VOL[*3]	Changing a copy pace *1 Copy pace [Prior Normal Slow] *2 P-VOL number *3 S-VOL number
3E9801 00	*1 Reserve LU for Volume Migration: LU[*2]	Defining or releasing reserved LU for Volume Migration *1 [Add Delete] *2 Reserved LU number
3E9901 00	Execute LRC Check	Specifying starting of LRC check
3E9902 00	Cancel LRC Check	Specifying stopping of LRC check

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E9C0100	*1: DP Pool[*2] TierMode=*3 AutoProgressMode=*4 RelocationMode=*5 RelocationSpeed=*6	Setting the DP pool tier management *1 Operation Mode [Change Tier Mode Start Monitor Stop Monitor Reset Monitor Start Relocation Stop Relocation Speed] *2 DP pool number *3 Tier mode [Enable Disable] (Note 22) *4 Auto Progress Mode [Enable Disable](Note 22) *5 High Efficiency Relocation Mode [Enable Disable](Note 22) *6 Relocation speed [Middle High Low] (Note 22)
3EB00100	Set TimeZone=[*1] DaylightSaving=*2 NTP1=*3 NTP2=*4	Setting the time zone and NTP server *1 Time zone *2 Daylight saving [Enable Disable] *3 NTP server 1 [optional character string] *4 NTP server 2 [optional character string]
3EB20100	Set Audit Log Options: Transfer=*1 Server1_IP=*2 Server2_IP=*3 Internal=*4	Setting the Audit Logging options *1 Whether to transfer to the syslog server or not [ON OFF] *2 IP address of syslog server 1 (Note 9) *3 IP address of syslog server 2 (Note 9, 10) *4 Internal log [Enable Disable]
3EB30100	Export Internal Log (*1 file(s) completed)	Exporting the Audit logged files *1 Exported logged files number
3EB40100	Initialize Internal Log	Initializing the Audit logged data

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3EB50100	Set Account Authentication Parameters: SessionTimeout= *1	Setting the session time out (unit: minutes) *1 [20 25 30 35 40 45 50 55 60 70 80 90 100 110 120 1DAY OFF]
3EB60100	*1 User Account	Setting the Account Authentication information *1 [Add Delete Modify]
3EB70100	Login (Account Authentication)	Logged in as Account Authentication user ID
3EB70200	Logout (Account Authentication)	Log out already logged in as Account Authentication user ID
3EB70300	Force Logout of*1 (Account Authentication)	Forced log out already logged in as Account Authentication user ID *1 Forced log out user ID
3EB70400	Start HSNM2 Alert Monitoring	Starting error monitoring
3EB70400	Start HSNM2 Script	Starting script
3EB70400	Start HSNM2 Script	Finish script
3EBB0100	Spin Up RAID Group[*1]	Setting spin up *1 RAID group number
3EBB0200	Spin Down RAID Group[*1] Mode= *2 IOMonitoringTime= *3	Setting spin down (I/O Link Disabled) *1 RAID group number *2 Detailed setting of spin down [Spindown Only Traypoweroff] *3 IO monitoring time [Optional character string]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3EBB0300	Execute Power Saving: RAID Group [*1] Mode=*2 SpindownIOMonitoringTime=*3 PoweroffIOMonitoringTime=*4	Setting power saving (I/O Link Disabled) in Power Saving Plus (Note 23) *1 RAID group number *2 Detailed setting of Power Saving [Spindown/Poweroff Spindown and Poweroff] *3 Spindown I/O monitoring time [Optional character string] *4 Drive power OFF I/O monitoring time [Optional character string]
3EBC0100	Start to Install Tray	Starting adding a tray
3EBD0100	Set LU Ownership: LUN=*1 CTL=*2 Core=*3	Setting an LU ownership *1 LUN for to be change a ownership *2 Destination controller for to be change a ownership CTL[CTL0 CTL1] *3 Destination core for to be change a ownership [MP0 MP1]
3EBE0100	Enable Locate: Unit0-Unit7[*1] Unit8-Unit9[*2]	Specifying LED turning on (HUS110) *1 Information Unit 0 to Unit 7 *2 information Unit 8 to Unit 9 Displaying 0 or 1 corresponding bit per 8 trays 0: OFF 1: ON
3EBE0200	Enable Locate: Unit0-Unit7[*1] Unit8-Unit15[*2] Unit16-Unit19[*3]	Specifying LED turning on (HUS130) *1 Information Unit 0 to Unit 7 *2 Information Unit 8 to Unit 15 *3 information Unit 16 to Unit 19 Displaying 0 or 1 corresponding bit per 8 trays 0: OFF 1: ON

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3EBE0300	Enable Locate: CTU[*1] Unit0-Unit7[*2] Unit8-Unit15[*3] Unit16-Unit23[*4] Unit24-Unit31[*5] Unit32-Unit39[*6] Unit40-Unit47[*7] Unit48-Unit55[*8] Unit56-Unit63[*9] Unit64-Unit71[*10] Unit72-Unit79[*11]	Specifying LED turning on (HUS 100) *1 Information CTU *2 Information Unit 0 to Unit 7 *3 Information Unit 8 to Unit 15 *4 Information Unit 16 to Unit 23 *5 Information Unit 24 to Unit 31 *6 Information Unit 32 to Unit 39 *7 Information Unit 40 to Unit 47 *8 Information Unit 48 to Unit 55 *9 Information Unit 56 to Unit 63 *10 Information Unit 64 to Unit 71 *11 Information Unit 72 to Unit 79 Displaying 0 or 1 corresponding bit per 8 trays 0: OFF 1: ON

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3EBF0100	Set E-Mail Alerts: MailServerAddress= *1 DomainName= *2 FromAddress= *3 SendToAddress1= *4: *5 SendToAddress2= *6: *7 SendToAddress3= *8: *9 SendToAddress4= *10: *11 ReplyToAddress= *12 MailAdditionalInformation= *13	Setting E-Mail alerts *1 Mail server IP address *2 Mail server domain name *3 E-Mail sender address *4 E-Mail sender classification 1 [TO BCC] *5 E-Mail receiver address 1 *6 E-Mail sender classification 2 [TO BCC] *7 E-Mail receiver address 2 *8 E-Mail sender classification 3 [TO BCC] *9 E-Mail receiver address 3 *10 E-Mail sender classification 4 [TO BCC] *11 E-Mail receiver address 4 *12 E-Mail return address *13 E-Mail additional information
3EBF0200	Set E-Mail Alerts: *1	Setting E-Mail alerts *1 Setting E-Mail alerts function [Enable E-Mail Alerts Disable E-Mail Alerts Initialize Parameters]
3EBF0300	Send Test Mail From *1	Sending a test E-Mail alerts *1: Controller number [CTL0 CTL1]
3EC10100	Set TrueCopy Options: CycleTime= *1sec Message= *2 Queuing-InhibitingTime= *3msec	Setting of TrueCopy options *1 Cycle time *2 Cycle over message [Enable Disable] *3 Inhibiting time of queuing
3EC10200	Initialize TrueCopy Options	Initializing the setting options of TrueCopy

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3EC70100	Set CTG Information: CopyType=*1 CTGNo=*2 CTGName=*3	Setting CTG definition information *1 Copy type [LocalReplication RemoteReplication] *2 CTG number *3 CTG name
3EC90100	Set Pair Information: CopyType=*1 P-VOL=*2 S-VOL=*3 PairName=*4 CopyPace=*5 GroupNumber=*6 LUNassign=*7	Setting a pair definition information *1 Copy type [ShadowImage Snapshot TrueCopy TrueCopyExtended Distance] *2 P-VOL number *3 S-VOL number *4 Pair name *5 Copy pace [Fast Medium Slow] *6 CTG number [Optional character string Ungrouped] *7 LUN assignment [Enabled Disable]
3ECB0100	Replacement of Array: Mode=*1 CopyPace=*2	Auto migration *1 Process mode [FlagReset CreateCopy DataShredding CopyPace] *2 Copy pace [Fast Medium Slow]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3ECB0200	Replacement of Array: Mode=ChangeAccessPath Target= *1 <CTL0 ObtainAdd= *2 IPv4= *3 Subnet= *4 Gateway= *5 ObtainAdd= *6 IPv6= *7 Subnet= *8 Gateway= *9 Negotiation= *10> <CTL1 ObtainAdd= *2 IPv4= *3 Subnet= *4 Gateway= *5 ObtainAdd= *6 IPv6= *7 Subnet= *8 Gateway= *9 Negotiation= *10> AUTO_CHNG= *11	Auto migration (changing the access path): Outputs together with 3ECB0300. *1 Target array [Old] *2 Setting method of IPv4 address [DHCP Manual] *3 IPv4 address *4 Subnet mask *5 Default gateway address *6 Setting method of IPv6 address [DHCP Manual] *7 IPv6 address *8 Subnet prefix *9 Default gateway address *10 Negotiation mode [Auto 10Mbps/ Half 10Mbps/Full 100Mbps/ Half 100Mbps/Full 1Gbps/Full] *11 Maintenance port IP address automatic change mode [Enable Disable]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3ECB0300	Replacement of Array: Mode=ChangeAccessPath Target=*1 <CTL0 ObtainAdd=*2 IPv4=*3 Subnet=*4 Gateway=*5 ObtainAdd=*6 IPv6=*7 Subnet=*8 Gateway=*9 Negotiation=*10> <CTL1 ObtainAdd=*2 IPv4=*3 Subnet=*4 Gateway=*5 ObtainAdd=*6 IPv6=*7 Subnet=*8 Gateway=*9 Negotiation=*10> AUTO_CHNG=*11	Auto migration (changing the access path): Outputs together with 3ECB0200. *1 Target array [New] *2 Setting method of IPv4 address [DHCP Manual] *3 IPv4 address *4 Subnet mask *5 Default gateway address *6 Setting method of IPv6 address [DHCP Manual] *7 IPv6 address *8 Subnet prefix *9 Default gateway address *10 Negotiation mode [Auto 10Mbps/ Half 10Mbps/Full 100Mbps/ Half 100Mbps/Full 1Gbps/Full] *11 Maintenance port IP address automatic change mode [Enable Disable]
3ECD0100	Set Warning Banner=*1	Setting a banner *1 Warning banner [Enable Disable]
3ECE0100	Set Battery Valid Number=*1	Setting a valid battery number *1 Valid battery number [1 2 3 4 5 6]
3ED00100	*1 iSCSI Remote Path: SerialNumber=*2	Setting a remote path information of TrueCopy TrueCopy Extended Distance (iSCSI) *1 Operation [Set Delete] *2 Remote array serial number
3ED20100	Change User Certificate and PrivateKey	Updating the SSL user certificate
3ED30100	Expand RG: RG=*1, AddDrives=Unit[*2]HDU[*3]	Expansion of RAID group *1 RAID group number *2 Unit number *3 HDU number

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3ED30200	Change Priority of RG Expansion: Priority=*1	Changing of RAID group expansion priority *1 Priority [HostAccess RGExpansion]
3ED30300	Remove Instruction of RG Expansion: RG=*1 Mode=*2	Termination of RAID group expansion *1 RAID group number *2 Method to terminate [Normal Return To Original RG Forcibly Forced Termination]
3ED50100	Replacement of Array: Mode=ConnectNewArray SerialNumber=*1 <Path0A IP=*2 Port=*3> <Path0B IP=*4 Port=*5> <Path1A IP=*6 Port=*7> <Path1B IP=*8 Port=*9>	Auto migration (connection new array) *1 Remote array serial number *2 IP address *3 TCP port number *4 IP address *5 TCP port number *6 IP address *7 TCP port number *8 IP address *9 TCP port number
3ED50200	Replacement of Array: Mode=CopyPace CopyPace=*1	Auto migration (changing copy pace) *1 Copy pace [Fast Medium Slow]
3ED50300	Replacement of Array: Mode=ResetMigrationStatus	Auto migration (reset migration status)
		*16 Buffer Space for New Page Assignment (3rd tier)[Optional character string] *17 Buffer Space for Tier Relocation (1st tier)[Optional character string] *18 Buffer Space for Tier Relocation (1st tier)[Optional character string] *18 Buffer Space for Tier Relocation (2nd tier)[Optional character string] *19 Buffer Space for Tier Relocation (3rd tier)[Optional character string]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3ED60100	Create DP_Pool: DP_Pool[*1] DP_RG[*2] RAIDLevel=*3(*4) <ConsumedCapacityAlert: EarlyAlert=*3% Depletion=*4% Notification=*5> <OverProvisioningThreshold: Warning=*6% Limit=*7% Notification=*8> LimitEnforcement=*9<ReplicationThreshold Depletion=*10% DataRelease=*11%>	Creating of DP pool *1 DP pool number [Optional character string] *2 DP RAID group number [Optional character string AUTO] *3 Early alert of consumed capacity [Optional character string] *4 Depletion alert of consumed capacity [Optional character string] *5 Threshold over notification of consumed capacity alert [Enable Disable] *6 Warning of over provisioning [Optional character string] *7 Limit of over provisioning [Optional character string] *8 Limit alert notification of over provisioning [Enable Disable] *9 Over Provisioning Limit Enforcment [Enable Disable] *10 Replication Depletion Alert Threshold [Optional character string] *11 Replication Data Release Threshold [Optional character string]
3ED60200	Expand DP_Pool: DP_Pool[*1] DP_RG[*2] AddDrives=Unit[*3]HDU[*4] OptimizingDP=*5	Expansion of DP pool *1 DP pool number [Optional character string] *2 DP RAID group number [Optional character string] *3 Adding drives unit number *4 Adding drives HDU number *5 Optimizing of the DP pool [Yes No]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3ED603 00	Delete DP_Pool: DP_Pool[*1]	Deleting of DP pool *1 DP pool number [Optional character string]
3ED604 00	Change DP_Pool: DP_Pool[*1] <ConsumedCapacityAlert: EarlyAlert=*2% Depletion=*3%> Notification=*4><OverProvisioningThreshold: Warning=*5% Limit=*6%> OverProvisioningNotice=*7>LimitEnforcement=* 8> <Replication Threshold: Depletion=*9% DataRelease=*10%>	Changing of DP pool *1 DP pool number [Optional character string] *2 Early alert of consumed capacity [Optional character string] *3 Depletion alert of consumed capacity [Optional character string] *4 Threshold over notification of consumed capacity alert [Enable Disable] *5 Warning of over provisioning [Optional character string] *6 Limit of over provisioning [Optional character string] *7 Limit alert notification of over provisioning [Enable Disable] *8 Over Provisioning Limit Enforcement [Enable Disable] *9 Replication Depletion Alert Threshold [Optional character string] *10 Replication Data Released Threshold [Optional character string]
3ED605 00	Restore DP_Pool: DP_Pool[*1]	Restore DP pool *1 DP pool number [Optional character string]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3ED60600	Create DP_Pool: DP_Pool[*1] DP_RG[*2] TierMode=*3 AutoProgressMode=*4 RelocationMode=*5 <ConsumedCapacityAlert: EarlyAlert=*6% Depletion=*7% Notification=*8> <OverProvisioningThreshold: Warning=*9% Limit=*10% Notification=*11 LimitEnforcement=*12> <Replication Threshold: Depletion=*13% DataRelease=*14%> <NewPage: 1st=*15 2nd=*16 3rd=*17> <Relocation Buffer: 1st=*18 2nd=*19 3rd=*20>	Creating of DP pool *1 DP pool number [Optional character string] *2 DP RAID group number [Optional character string AUTO] *3 Tier mode [Enable Disable] *4 Auto Progress Mode [Enable Disable] *5 High Efficiency Relocation Mode [Enable Disable] *6 Early alert of consumed capacity [Optional character string] *7 Depletion alert of consumed capacity [Optional character string] *8 Threshold over notification of consumed capacity alert [Enable Disable] *9 Warning of over provisioning [Optional character string] *10 Limit of over provisioning [Optional character string] *11 Limit alert notification of over provisioning [Enable Disable] *12 Over Provisioning Limit Enforcement [Enable Disable] *13 Replication Depletion Aleat Threshold [Optional character string] *14 Replication Data Released Threshold [Optional character string] *15 Buffer Space for New Page Assignment (1st tier) [Optional character string] *16 Buffer Space for New Page Assignment (2nd tier) [Optional character string]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
		*17 Buffer Space for New Page Assignment (3rd tier)[Optional character string] *18 Buffer Space for Tier Relocation (1st tier)[Optional character string] *19 Buffer Space for Tier Relocation (2nd tier)[Optional character string] *20 Buffer Space for Tier Relocation (3rd tier)[Optional character string]
3ED60700	Expand DP_Pool: DP_Pool[*1] DP_RG[*2] OptimizingDP=*3	Expansion of DP pool *1 DP pool number [Optional character string] *2 DP RAID group number [Optional character string AUTO] *3 Optimizing of the DP pool[Yes No]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3ED60800	Change DP_Pool: DP_Pool[*1]<ConsumedCapacityAlert: EarlyAlert=*2% Depletion=*3% Notification=*4> <OverProvisioningThreshold: Warning=*5% Limit=*6% Notification=*7> <ReplicationThreshold: Depletion=8% DataRelease=*9%> <BewOageL 1st=*10 2nd=*11 3rd=*12> <RelocationBuffer: 1st=*13 2nd=*14 3rd=*15>	Changing of DP pool *1 DP pool number [Optional character string] *2 Early alert of consumed capacity [Optional character string] *3 Depletion alert of consumed capacity [Optional character string] *4 Threshold over notification of consumed capacity alert [Enable Disable] *5 Warning of over provisioning [Optional character string] *6 Limit of over provisioning [Optional character string] *7 Limit alert notification of over provisioning [Enable Disable] *8 Replication Depletion Alert Threshold [Optional character string] *9 Replication Data Released Threshold [Optional character string] *10 Buffer Space for New Page Assignment (1st tier) [Optional character string] *11 Buffer Space for New Page Assignment (2nd tier) [Optional character string] *12 Buffer Space for New Page Assignment (3rd tier) [Optional character string] *13 Buffer Space for Tier Relocation (1st tier) [Optional character string] *14 Buffer Space for Tier Relocation (2nd tier) [Optional character string] *15 Buffer Space for Tier Relocation (3rd tier) [Optional character string]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3ED60900	Shrink DP_Pool: DP_Pool[*1] DP_RG[*2]	Shrinking of the DP pool *1 DP pool number [Optional character string] *2 DP RAID group number [Optional character string]
3ED60A00	Cancel Shrink DP_Pool: DP_Pool[*1] DP_RG[*2]	Cancellation of the DP pool shrink *1 DP pool number [Optional character string] *2 DP RAID group number [Optional character string]
3EDA0100	Optimize DP_Pool: AllLUInTheDP_Pool=*1 OptimizingDP=*2 ReclaimingZeroPages=*3 LU[*4]	Optimizing of the DP pool *1 Batch specifying of the DP pool optimizing [Yes No] *2 Optimizing of the DP pool [Yes No] *3 Executing of 0 data deleting [Yes No] *4 LU number [Optional character string]
3EDA0200	Cancel the Optimization of DP_Pool: AllLUInTheDP_Pool=*1 LU[*2]	Cancellation of the DP pool optimizing *1 Batch specifying of cancellation of the DP pool optimizing [Yes No] *2 LU number [Optional character string]
3EDA0300	Change the Priority of DP Optimization: *1	Changing a priority of the DP pool optimizing *1 Priority [Optimization Host Access Normal]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3EDA0400	Change Provisioning Attribute: <<AcceleratedWideStripingMode=*1 OptimizingDP=*2> FullCapacityMode=*3 <AutoDPOptimize=*4 AllUsInTheDP_Pool=*6>> <Promotion=*7 Tier=*8 <MonitoredIO: Read=*9 Write *10> DisablingTier=*11 AllUsInTheDP_Pool=*12>	Changing an attribute of the DP pool LU (Note 14) *1 Accelerated wide striping mode [Enable Disable] *2 DP pool LU optimizing [Yes No] *3 Full Capacity Mode [Enable Disable] *4 Auto DP Optimize [Enable Disable] *5 Threshold for Auto DP Optimize *6 Batch specifying of Auto DP optimize [Yes No] (Note 24) *7 Promptly Promotion Mode (Note 21)[Enable Disable #] *8 New Page Assignment Tier (Note 21) [Middle High Low] *9 Monitored I/O (Read) (Note 21) [Enable Disable] *10 Monitored I/O (Write) (Note 21) [Enable Disable #] *11 DisablingTier Relocation (Note 21) [Enable Disable] *12 Batch specifying of Disabling Tier Relocation setting [Yes No] Auto DP optimize[Yes No]
3EDE0100	Release the SCSI Reservation: LU[*1]	Release the reservation LU forcibly *1 LU number [Optional character string]
3EE00100	Set Port Error Count: <ResetCounter=*1> <Threshold Port0A=*2 Port08=*2. Port0D=*2 Port0F=*2 Port0G=*2 Portrt0H=*2 Port 1A=*2 Port1B=*2 Port1C=*2 Port1D=*2 Port1E=*2 Port1F=*2 Port1G=*2 Port1H=*2>	Setting of capture port error count *1 The port number that is reset the report counter. *2 The report counter threshold value [Optional character string]
3EE10100	Back Up Master Authentication Key	Back up Master Authentication Key for the Self-Encrypting Drive

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3EE102 00	Restore Master Authentication Key	Restore Master Authentication Key for the Self-Encrypting Drive
3EE103 00	Refresh Authentication Keys	Refresh Master Authentication Key and Authentication Keys for the Self-Encrypting Drive
3EE301 00	*1 I/F Module/Board <Location CTL[*2] Slot/Board[*3]>	I/F module board detach/add/remove information (Note 20) *1 Operation [Detach Prepare adding Start adding Remove] *2 Controller number *3 Slot number
3EE501 00	Change SSD Options: Threshold = *1 %	Setting the SSD options *1 Threshold of Endurance
3EE601 00	Change Packet Filtering = *1	Setting the packet filtering *1 Packet Filtering [Enable Disable]
3EE602 00	Block Port 80 = *1	Setting the port 80 *1 80 port block [Enable Disable]
3F0101 00	Configuration failed: Inappropriate parameters	Configuration failed for inappropriate parameters
3F0201 00	Configuration failed: The Option[*1] is Disable or De-installed	Configuration failed for the priced option is disable or uninstalled (Note 11) *1 The priced option name
3F0301 00	Configuration failed: Temporary/Emergency Key[*1] expired	Configuration failed for the temporary or emergency key is expired (Note 11) *1 The priced option name
410401 00	Session Timeout: *1	Session timeout occurs of the already logged in with Account Authentication user ID *1 User ID
410901 00	Reference/Modification failed: Authentication authority is insufficient	Referencing or modification failed for Authentication authority is insufficient

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
510101 00	Start Online Microprogram Download	Starting the firmware downloading online
510102 00	Start Online Microprogram Update: CTL*1	Starting the firmware updating online *1 Controller number
510201 00	Start ENC Microprogram Download	Starting ENC firmware downloading online
510202 00	Start ENC Microprogram Update: ENC*1	Starting ENC firmware updating online *1 ENC number
510301 00	System Reboot	Rebooting after the system configuration
510302 00	Release Reboot Wait Condition: CTL*1	Releasing reboot wait condition *1 Controller number
520101 00	System Shutdown (Reboot Request)	Reboot request from Navigator 2
710101 00	Subsystem is Ready	Array is ready
710201 00	PS OFF	Array power off



Notes on the above table:

Note 1: If this is Disable, # is the output.

Note 2: When the *1 is Disable, # is the output.

Note 3: When the controller, which received the command, does not have the ownership of the LU, two or more logs of “Failed” may be collected in “Result of the audit event” of “COMMENT part in MSG” until the switching of the ownership is completed internally. Usually, it is retried in the upper application, and finally the log of “Success” is collected.

Note 4: When the MainLU value is invalid, # is the output for the SubLU.

Note 5: If there is only one CTL, # is the output.

Note 6: When the *6 is Disable, # is the output.

Note 7: If there is only one CTL, # is the output for all the parameters on the CTL1 side.

Note 8: If only one parameter is set, # is the output for the other one.

Note 9: When the *1 is OFF, # is the output.

Note 10: When the *1 is ON and the server 2 is not set, # is the output.

Note 11: Maximum three abbreviations of the priced options may be output. This shows that all or any of the priced options are the targets.

Note 12: The unmounted Fibre/iSCSI port, # is the output.

Note 13: When the *3 is RG, # is the output.

Note 14: When this is not changed, # is the output.

Note 16: When remote array is AMS/WMS series or AMS 2000 series, # is the output.

Note 17: When remote array is HUS100 series, # is the output.

Note 18: When the *5 is Disable, # is the output.

Note 19: When the result of the audit event is Failed, fourteen # is the output.

Note 20: When the *1 is **Remove**, # is output to *2. When the *1 is **Prepare adding** or **Start adding**, # is output on both *2 and *3.

Note 21: When Tier Mode is Disable, # is output.

Note 22: When it is not the change target of the operation mode, # is output.

Note 23: When *2 is **Poweroff**, # is output to *3, when *2 is **Spindown**, # is output to *4.

Note 24: When *8 is **Disable**, # is output to *9 and *10.

Audit log setting example

This section provides a procedure for setting Audit Logging where the external Syslog server receives the log sent from the disk array. This procedure is uses a setup under the syslogd of Linux (Fedora Core and so forth).



NOTE: For the procedure for installing syslogd, refer to a manual of each OS. Since the procedure for setting the Syslog server depends on a user environment, it may be different from the one described here.

1. Edit “/etc/syslog.conf” file, and specify file name to be outputting log.
(Example: output the log to “/var/log/Audit_logging.log”)

```
# Audit Logging
user.* /var/log/Audit_logging.log
```

2. Set syslogd to accept log transfer from the outside.

Edit “/etc/sysconfig/syslog” file. Add –r to “SYSLOGD_OPTIONS”.

```
# SYSLOGD_OPTIONS="-r -m 0"
```

3. Restart syslogd after setting.

```
# service syslog restart
```

Cache Partition Manager

This section includes the following topics:

- [Installing](#)
- [Enabling or disabling](#)
- [Adding a cache partition](#)
- [Assigning a cache partition](#)
- [Setting a pair cache partition](#)
- [Changing the cache partition owner controller](#)

When the pair status of TrueCopy or TCE is Paired or Synchronizing, the state is changed to Failure.

When you perform the setting, deleting, or changing of Cache Partition Manager in the case where the array is used on the remote side of TrueCopy or TCE, the following phenomena occur with the restart of the array.

Both paths of TrueCopy or TCE are blocked. When a path is blocked, a TRAP occurs, that is, a notification to the SNMP Agent Support Function. Inform the departments concerned of the above beforehand. The path of TrueCopy or TCE is recovered from the blockade automatically after the array is restarted.

When you restart the array necessarily, perform the setting, deleting, or changing of Cache Partition Manager after changing the pair status of TrueCopy or TCE to Split.

If a Cache Partition is added, deleted, or changed during a spin-down instruction before completing the spin-down when Power Saving is enabled, the spin down may fail. If a spin-down fails, execute the spin-down again. Check that the spin-down instruction has not been issued or has been completed (no RAID group in the Power Saving Status of Normal(Command Monitoring) exists) before adding, deleting, or changing the Cache Partition.



NOTE: When the power saving instruction of the non I/O link is executed with the priced option, Power Saving, or Power Saving Plus, if a Cache Partition is added, deleted, or changed while the Power Saving status is Normal (Command Monitoring), the status changes to “Normal (Spin Down Failure: PS OFF/ON)”. The array reboot occurring at the time of the setting change returns the status change. After the change occurs, the spin-down may fail.

When the spin-down fails, run the spin-down again. Before adding, deleting, or changing the Cache Partition, check that the spin-down instruction has not been issued by the Power Saving instruction of the non I/O link and no RAID group whose Power Saving status is Normal (Command Monitoring).

Installing



NOTE: To make the Cache Partition Manager functions available, you must install the Cache Partition Manager feature and make its functions selectable (unlocked). This requires a key code or key file.

To install the Cache Partition Manager feature:

1. From the command prompt, register the array in which you will install the Cache Partition Manager feature and connect to the array.
2. Install the optional feature by using the following:

```
% auopt -unit array-name -lock off -keycode manual-attached-keycode
Are you sure you want to install the option?
(y/n [n]): y
The option is unlocked.
%

% auopt -unit array-name -refer
Option Name      Type      Term      Status
Reconfigure Memory Status
CACHEPARTITIONPermanent ---      Enable
N/A
%
```

Uninstalling

The capacity of the master partition must be the default partition size. The following conditions must be satisfied in order to uninstall Cache Partition Manager: All the sub-partitions other than the master partition must be deleted.

To uninstall Cache Partition Manager:

1. From the command prompt, register the array in which you will uninstall Cache Partition Manager, and connect to the array.
2. Uninstall the optional features by using the following:

```
% auopt -unit array-name -lock on -keycode manual-attached-keycode
Are you sure you want to de-install the option?
(y/n [n]): y
The option is unlocked.
%

% auopt -unit array-name -refer
DMEC002015: No information displayed.
%
```

Enabling or disabling

Cache Partition Manager can be enabled or disabled without uninstalling this function.

The following conditions must be satisfied in order to disable Cache Partition Manager:

All the sub-partitions other than the master partition must be deleted.

The capacity of the master partition must be the default partition size.

To enable or disable Cache Partition Manager (without uninstalling this function):

1. From the command prompt, register the array in which you will change the status of the Cache Partition Manager feature and connect to the array.
2. Execute the auopt command to change the status (enable or disable) of the Cache Partition Manager feature.
3. The following is an example of how to change the status from enable to disable. To change the status from disable to enable, enter enable after the -st option.

```
% auopt -unit array-name -option CACHEPARTITION -st disable
Are you sure you want to disable the option?
(y/n [n]): y
The option has been set successfully.
%

% auopt -unit array-name -refer
Option Name      Type      Term      Status
Reconfigure Memory Status
CACHEPARTITION  Permanent ---      Disable
N/A
%
```

Adding a cache partition

You must reboot the array for the changes to be effective. To add a cache partition:

1. From the command prompt, register the array in which you want to set Cache Partition Manager and connect to the array.
2. Execute the aucachept command to investigate the cache memory.

```
% aucachept -unit array-name -refer
Current Information
  User Capacity[MB] ? 1000
  Free Size[MB]
    CTL0? 0
    CTL1? 0
  No.  CTL      Partition Size[10MB]      Segment Size[KB]
    0   0              50                  16
    1   1              50                  16

Reserved Information
  No.  CTL      Partition Size[10MB]      Segment Size[KB]
    0   0              50                  16
    1   1              50                  16
%
```

Area sizes of the master partitions (Nos. 1 and 2) are changed to 20 respectively, because no free area is left.

```
% aucachept -unit array-name -chg -pt 0 -ptsize 20
The size of cache partition 0 is changed into 200MB.
Do you want to continue processing? (y/n [n]): y
The pair cache partition may be changed into "Auto". Please confirm pair cache
p
```

```
artition after reboot.
Do you want to continue processing? (y/n [n]): y
In order to complete the changing, it is necessary to reboot the subsystem.
When not restarting, the changing will be registered, but it will not become
eff
```

```
ective on the subsystem.
Please execute this command again without restarting, if you want to continue
setting of the cache partition.
Do you restart the subsystem? (y/n [n]): n
Are you sure you want to change the cache partition? (y/n [n]): y
The cache partition has been changed successfully.
Please restart the subsystem to enable the setting.
```

```
% aucachept -unit array-name -chg -pt 1 -ptsize 20
The size of cache partition 1 is changed into 200MB.
Do you want to continue processing? (y/n [n]): y
The pair cache partition may be changed into "Auto". Please confirm pair cache
partition after reboot.
Do you want to continue processing? (y/n [n]): y
In order to complete the changing, it is necessary to reboot the subsystem.
When not restarting, the changing will be registered, but it will not become
effective on the subsystem.
Please execute this command again without restarting, if you want to continue
setting of the cache partition.
Do you restart the subsystem? (y/n [n]): y
Host will be unable to access the subsystem while restarting.
Host applications that use the subsystem will terminate abnormally. Please
stop host access before you restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting
begins.
When using Remote Replication, restarting the remote subsystem will cause
both Remote Replication paths to fail.
Remote Replication pair status will be changed to "Failure(PSUE)" when pair
status is "Paired(PAIR)" or "Synchronizing(COPY)". Please change Remote
Replication pair status to "Split(PSUS)" before restart.
When load balancing of tuning parameter is enabled, LU partition may move to
pair partition automatically according to state of CPU load. In order to
disable movement of pair partition, it is necessary to disable load balancing
of tuning parameter.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute?
(y/n [n]): y
```

```
Now restarting the subsystem. Start Time hh:mm:ss Time Required 7- 25min.
The subsystem restarted successfully.
%
```

A cache partition is added (partition size: 20, segment size: 8 kB, owner controller: 0).

```
% aucachept -unit array-name -add -ptsize 20 -segsz 8 -ctl0
The reserved cache partition 2 in size 200MB is set up to CTL0.
Do you want to continue processing? (y/n [n]): y
In order to complete the setting, it is necessary to reboot the subsystem.
When not restarting, the setting will be registered, but it will not become
effective on the subsystem.
Please execute this command again without restarting, if you want to continue
setting of the cache partition.
Do you restart the subsystem? (y/n [n]): y
Host will be unable to access the subsystem while restarting.
Host applications that use the subsystem will terminate abnormally. Please
stop
host access before you restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting
begins.
When using Remote Replication, restarting the remote subsystem will cause
both R
emote Replication paths to fail.
Remote Replication pair status will be changed to "Failure(PSUE)" when pair
stat
us is "Paired(PAIR)" or "Synchronizing(COPY)". Please change Remote
Replication
pair status to "Split(PSUS)" before restart.
When load balancing of tuning parameter is enabled, LU partition may move to
pai
r partition automatically according to state of CPU load. In order to disable
mo
vement of pair partition, it is necessary to disable load balancing of tuning
pa
rameter.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute?
(y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 7 - 25min.
The subsystem restarted successfully.
%
```

Deleting a cache partition

To delete the created cache partition, it is required to move the logical unit that has been assigned to the created cache partition to the other partition.

To delete a cache partition:

1. From the command prompt, register the array in which you want to set Cache Partition Manager and connect to the array.
2. Execute the aucachept command to delete the created cache partition. See following example.

```
% aucachept -unit array-name -rm -pt 2
The cache partition 2 is deleted.
Do you want to continue processing? (y/n [n]): y
The pair cache partition may be changed into "Auto". Please confirm pair cache
p
artition after reboot.
Do you want to continue processing? (y/n [n]): y
In order to complete the deleting, it is necessary to reboot the subsystem.
When not restarting, the deleting will be registered, but it will not become
eff
ective on the subsystem.
Please execute this command again without restarting, if you want to continue
se
tting of the cache partition.
Do you restart the subsystem? (y/n [n]): y
Host will be unable to access the subsystem while restarting.
Host applications that use the subsystem will terminate abnormally. Please
```

```

stop
host access before you restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting
begins.
When using Remote Replication, restarting the remote subsystem will cause
both Remote Replication paths to fail.
Remote Replication pair status will be changed to "Failure(PSUE)" when pair
status is "Paired(PAIR)" or "Synchronizing(COPY)". Please change Remote
Replication pair status to "Split(PSUS)" before restart.
When load balancing of tuning parameter is enabled, LU partition may move to
pair partition automatically according to state of CPU load. In order to disable
movement of pair partition, it is necessary to disable load balancing of tuning
parameter.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute?
(y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 7 - 25min.
The subsystem restarted successfully.
%

```

Assigning a cache partition

If you do not assign an LU to a specified cache partition, it will be assigned to the master partition.

To assign a cache partition:

1. From the command prompt, register the array in which you want to set Cache Partition Manager, and connect to the array.
2. Execute the aulucachept command to assign the cache memory. First, verifying the status.

```

% aulucachept -unit array-name -refer
      Cache      Pair Cache      Current Cache
      Partition Partition Partition
LUN
  0          0      Auto          0
  1          0      Auto          0
  :
  :
  :
  50         0      Auto          0
  :
  :
  :
%

```

Following shows logical unit 50 is assigned to cache partition 2.

```

% aulucachept -unit array-name -set -lu 50 -pt 2
Are you sure you want to assign the cache partition? (y/n [n]): y
The pair cache partition may be changed into "Auto". Please confirm pair cache
partition after reboot.
Do you want to continue processing? (y/n [n]): y
In order to complete the setting, it is necessary to reboot the subsystem.
When not restarting, the setting will be registered, but it will not become
effective on the subsystem.
Do you restart the subsystem? (y/n [n]): y
Host will be unable to access the subsystem while restarting.
Host applications that use the subsystem will terminate abnormally. Please
stop
host access before you restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting
begins.
When using Remote Replication, restarting the remote subsystem will cause
both Remote Replication paths to fail.
Remote Replication pair status will be changed to "Failure(PSUE)" when pair
status

```

```

us is "Paired(PAIR)" or "Synchronizing(COPY)". Please change Remote
Replication
pair status to "Split(PSUS)" before restart.
When load balancing of tuning parameter is enabled, LU partition may move to
pai
r partition automatically according to state of CPU load. In order to disable
mo
vement of pair partition, it is necessary to disable load balancing of tuning
pa
rameter.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute?
(y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 7 - 25min.
The subsystem restarted successfully.
%
```

Setting a pair cache partition

Use the pair cache partition in the “Auto” mode. We recommend you set the Load Balancing to Disable when using Cache Partition Manager. However, set the pair cache partition only when you use Cache Partition Manager when Load Balancing is set to Enable and want to specify the partition to be changed with Load Balancing. The owner controller must be different for the partition to which the logical unit belongs and the pair cache partition.

To set a pair cache partition, complete the following steps:

1. From the command prompt, register the array in which you want to set Cache Partition Manager and connect to the array.
2. Execute the `aulucachept` command to set the pair cache partition.

```
% aulucachept -unit array-name -set -lu 50 -pairpt auto
Are you sure you want to register the pair cache partition assignment?
(y/n [n]): y
The pair cache partition assignment has been changed successfully.
%
```

Changing the cache partition owner controller

To change the cache partition owner controller:

1. From the command prompt, register the array in which you want to set Cache Partition Manager and connect to the array.
2. Execute the `aucachept` command to change the cache partition owner controller. See following example.

```
% aucachept -unit array-name -chg -pt 2 -ctl1
The cache partition 2 is changed into CTL1.
Do you want to continue processing? (y/n [n]): y
The pair cache partition may be changed into "Auto". Please confirm pair cache p
artition after reboot.
Do you want to continue processing? (y/n [n]): y
In order to complete the changing, it is necessary to reboot the subsystem.
When not restarting, the changing will be registered, but it will not become eff
ective on the subsystem.
Please execute this command again without restarting, if you want to continue se
tting of the cache partition.
Do you restart the subsystem? (y/n [n]): y
Host will be unable to access the subsystem while restarting.
Host applications that use the subsystem will terminate abnormally. Please stop
host access before you restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting b
egins.
When using Remote Replication, restarting the remote subsystem will cause both R
emote Replication paths to fail.
Remote Replication pair status will be changed to "Failure(PSUE)" when pair stat
us is "Paired(PAIR)" or "Synchronizing(COPY)". Please change Remote Replication
pair status to "Split(PSUS)" before restart.
When load balancing of tuning parameter is enabled, LU partition may move to pai
r partition automatically according to state of CPU load. In order to disable mo
vement of pair partition, it is necessary to disable load balancing of tuning pa
rameter.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute?
(y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 7 - 25min.
The subsystem restarted successfully.
%
```

Cache Residency Manager

This section includes the following:

- [Installing](#)
- [Enabling or disabling](#)
- [Operations of cache residency manager](#)

Installing

The Cache Residency Manager feature is usually not selectable (locked). To make the Cache Residency Manager available, you must install the Cache Residency Manager feature and make its functions selectable (unlocked). **To install this function, the key code or key file provided with the optional feature is required.**

Cache Residency Manager is installed and uninstalled using Storage Navigator Modular 2. Before installing and uninstalling, make sure that the array is in normal operating condition. If a failure such as a controller blockade has occurred, installation and un-installation operations cannot be performed.

To install the Cache Residency Manager using the CLI version of Storage Navigator Modular 2:

1. From the command prompt, register the array in which you will install the Cache Residency Manager feature and connect to the array.
2. Install the optional features by using the following:

Cache Partition Manager is enabled

```
% auopt -unit array-name -lock off -keycode manual-attached-keycode
Are you sure you want to install the option?
(y/n [n]): y
Cache Partition Manager is enabled. If the option using data pool will be
unlocked or enabled, the default cache partition information will be
restored.
Do you want to continue processing? (y/n [n]): y
The option is unlocked.
In order to complete the setting, it is necessary to reboot the subsystem.
Host will be unable to access the subsystem while restarting. Host
applications
that use the subsystem will terminate abnormally. Please stop host access
before you restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting
begins.
When using Remote Replication, restarting the remote subsystem will cause
both Remote Replication paths to fail.
Remote Replication pair status will be changed to "Failure(PSUE)" when pair
status is "Paired(PAIR)" or "Synchronizing(COPY)". Please change Remote
Replication pair status to "Split(PSUS)" before restart.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute? (y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 7 - 25min.
The subsystem restarted successfully.
%

% auopt -unit array-name -refer
Option Name      Type      Term      Status
Reconfigure Memory Status
CACHERESIDENCYPermanent ---      Enable
N/A
%
```

Uninstalling

To uninstall Cache Residency Manager using the CLI version of Storage Navigator Modular 2:

1. From the command prompt, register the array in which you will uninstall Cache Residency Manager and connect to the array.
2. Lock the optional features by using the following:

```
% auopt -unit array-name -lock on -keycode manual-attached-keycode
Are you sure you want to de-install the option?
(y/n [n]): y
The option is de-installed successfully.
In order to complete the setting, it is necessary to reboot the subsystem.
Host will be unable to access the subsystem while restarting. Host
applications
that use the subsystem will terminate abnormally. Please stop host access
before
you restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting
begins.
When using Remote Replication, restarting the remote subsystem will cause
both R
emote Replication paths to fail.
Remote Replication pair status will be changed to "Failure(PSUE)" when pair
stat
us is "Paired(PAIR)" or "Synchronizing(COPY)". Please change Remote
Replication
pair status to "Split(PSUS)" before restart.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute? (y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 7 - 25min.
The subsystem restarted successfully.
%

% auopt -unit array-name -refer
DMEC002015: No information displayed.
%
```

Enabling or disabling

Cache Residency Manager can be enabled or disabled without uninstalling this function.

To enable or disable Cache Residency Manager (without uninstalling this function) using the CLI version of Storage Navigator Modular 2:

1. From the command prompt, register the array in which you will change the status of the Cache Residency Manager feature and connect to the array.
2. Execute the auopt command to change the status (enable or disable) of the Cache Residency Manager feature.

The following example shows how to change the status from enable to disable. To change the status from disable to enable, enter enable after the -st option.

```
% auopt -unit array-name -option CACHERESIDENCY -st disable
Are you sure you want to disable the option?
(y/n [n]): y
The option has been set successfully.
In order to complete the setting, it is necessary to reboot the subsystem.
Host will be unable to access the subsystem while restarting. Host
applications
that use the subsystem will terminate abnormally. Please stop host access
before
you restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting
b
```

```

egins.
When using Remote Replication, restarting the remote subsystem will cause
both Remote Replication paths to fail.
Remote Replication pair status will be changed to "Failure(PSUE)" when pair
status is "Paired(PAIR)" or "Synchronizing(COPY)". Please change Remote
Replication pair status to "Split(PSUS)" before restart.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute? (y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 7 - 25min.
The subsystem restarted successfully.
%

% auopt -unit array-name -refer
Option Name      Type      Term      Status
Reconfigure Memory Status
CACHESIDENCYPermanent ---      Disable
N/A
%

```

Operations of cache residency manager

You can set an LU using Storage Navigator Modular 2 by installing the Cache Residency Manager function. The LU that is set for the Cache Residency Manager function must be previously defined. If the LU is not defined, define the LU (choose an LU that already exists and that you would like to be a Cache Residency Manager LU). Confirm that the conditions required for Cache Residency Manager operations are present before performing the operation (refer to the Storage Navigator Modular 2 online Help.).

1. From the command prompt, register the array in which you want to set Cache Residency Manager and connect to the array.
2. Execute the `auturbolu` command to specify the array.

```

% auturbolu -unit array-name -set -ctl1 assign enable -ctl1_lu 0
Are you sure you want to set the Cache Residency information? (y/n [n]): y
In order to complete the setting, it is necessary to reboot the subsystem.
When not restarting, the setting will be registered, but it will not become
effective on the subsystem.
Do you restart the subsystem? (y/n [n]): y
Host will be unable to access the subsystem while restarting. Host
applications that use the subsystem will terminate abnormally. Please stop host access
before you restart the subsystem.
Also, if you are logging in, the login status will be canceled when restarting
begins.
When using Remote Replication, restarting the remote subsystem will cause
both Remote Replication paths to fail.
Remote Replication pair status will be changed to "Failure(PSUE)" when pair
status is "Paired(PAIR)" or "Synchronizing(COPY)". Please change Remote
Replication pair status to "Split(PSUS)" before restart.
Do you agree with restarting? (y/n [n]): y
Are you sure you want to execute? (y/n [n]): y
Now restarting the subsystem. Start Time hh:mm:ss Time Required 7 - 25min.
The subsystem restarted successfully.
%

```

Specify as shown in the following example. Check the information that has been set.

```

% auturbolu -unit array-name -refer
Controller 0
Current Configuration
Assignment : off
LUN       :

```

```

        Status      :
Reserved Configuration
Assignment : off
LUN       :

Controller 1
Current Configuration
Assignment : on
LUN       : 0
Status    : valid
Reserved Configuration
Assignment : on
LUN       : 0
%
```

Data Retention Utility

This section includes the following:

- [Installing](#)
- [Enabling or disabling](#)
- [Setting an attribute](#)
- [Setting an S-VOL](#)
- [Setting the expiration lock](#)

Installing

The Data Retention Utility option is usually not selectable (locked). To make this option available, you must install Data Retention Utility and make its functions selectable (unlocked). To install this function, use the key code or key file provided with the optional feature.

Data Retention Utility is installed and uninstalled through Storage Navigator Modular 2 (CLI).

To install this function, the key code or key file provided with this optional feature is required.



NOTE: Before installing/uninstalling Data Retention Utility, verify that the array unit to be operated is functioning normally. If a failure such as a controller blockage has occurred, installation/un-installation cannot be performed.

To install Data Retention Utility using the CLI version of Storage Navigator Modular 2:

1. From the command prompt, register the array in which the Data Retention Utility feature is to be installed. Connect to the array.
2. Install the optional features by executing the `auopt` command as follows:

Cache Partition Manager is enabled

```
% auopt -unit array-name -lock off -keycode Key code
Are you sure you want to install the option?
(y/n [n]): y
```

```

When Cache Partition Manager is enabled, if the option using data pool will
be unlocked or enabled the default cache partition information will be
restored.
Do you want to continue processing? (y/n [n]): y
The option is unlocked.
%

% auopt -unit array-name -refer
Option Name      Type      Term      Status
                Reconfigure Memory Status
DATA-RETENTIONPermanent ---      Enable
                N/A
%

```

Uninstalling

When the Data Retention Utility feature is uninstalled, the Data Retention Utility feature is not available (locked) until it is installed by the key code or key file.



NOTE: Before installing/uninstalling Data Retention Utility, verify that the array unit to be operated is functioning normally. If a failure such as a controller blockage has occurred, installation/un-installation cannot be performed.

To uninstall Data Retention Utility, use the key code provided with the optional feature.

Data Retention Utility is installed and uninstalled through Storage Navigator Modular 2.

To uninstall Data Retention Utility using the CLI version of Storage Navigator Modular 2:

1. From the command prompt, register the array in which Data Retention Utility is to be uninstalled, then connect to the array.
2. Uninstall the optional features by executing the `auopt` command as follows:

```

% auopt -unit array-name -lock on -keycode Key code
Are you sure you want to de-install the option?
(y/n [n]): y
The option is de-installed successfully.
%

% auopt -unit array-name -refer
DMEC002015:No information displayed.
%

```

Enabling or disabling

Data Retention Utility can be set to enable or disable after installation. This allows Data Retention Utility to be activated or deactivated without the necessity of using the key code or key file.



NOTE: When disabling or uninstalling this Data Retention Utility feature, LU attributes that have been set must be returned to the initial attribute (Read/Write).

To enable/disable Data Retention Utility using the CLI version of Storage Navigator Modular 2:

1. From the command prompt, register the array (array unit) in which the status of the Data Retention Utility is to be changed, then connect to the array.
2. Execute the `auopt` command to change the status (enable or disable) of the Data Retention Utility feature.

The following is an example of how to change the status from enable to disable. To change the status from disable to enable, enter `enable` after the `-st` option.

```
% auopt -unit array-name -option DATA-RETENTION -st disable
Are you sure you want to disable the option?
(y/n [n]): y
The option has been set successfully.
%

% auopt -unit array-name -refer
Option Name      Type      Term      Status
Reconfigure Memory Status
DATA-RETENTIONPermanent ---      Disable
N/A
%
```

Setting an attribute

To set an attribute:

1. From the command prompt, register the array to which you want to set the attribute of the Data Retention Utility feature, then **connect to the array**.

Execute the `auluguard` command to set the attribute of the Data Retention Utility feature.

An example, in which an attribute type of the LU 1 is changed from Read/Write (default attribute) to Read/Write Inhibition (Protected), is shown here. Specify it as the `-term` option on years (0 to 60) and days (0 to 21,900).

```
% auluguard -unit array-name -set -lu 1 -attr Protect -term 0 0
Are you sure you want to change the access level of logical unit?
(y/n [n]): y
When setting starts, the subsystem stops accepting access to the logical unit
from the host.
Before setting, stop access to the logical unit from the host.
Do you want to continue processing? (y/n [n]): y
The access level of logical unit has been successfully changed.
%
```

When setting the attribute as Read Only, specify `-attr Read-Only`; when setting the attribute as Read/Write, specify `-attr Read Write`.

2. Execute the `auluguard` command to confirm whether an attribute has been set.

```
% auluguard -unit array-name -refer
Expiration Lock = OFF
LUN  Attribute      Capacity  S-VOL      Retention Term  Mode
0    Can't Guard     1.0 GB    ---        ---            ---
1    Protect         2.0 MB    Disable    0 days         ---
2    Read/Write      2.0 MB    Enable     ---            ---
%
```

LUN: LU number is displayed.

Attribute: Attribute (Read/Write, Read Only, Protect, or Can't Guard) is displayed.

Capacity: Capacity of the LU is displayed.

S-VOL: Whether the LU can be set to S-VOL (Enable) or is inhibited from being set to S-VOL (Disable) is displayed.

Mode: Mode (Read Capacity 0 (Zero), hiding from Inquiry Command Mode (Zer/Inv), or un-specifying (---)) is displayed. (For reference only.)

Retention: The length of time for retention (Unlimited or ---) is displayed.



NOTE: When Read only or Protect is set as the attribute, S-VOL will be disabled.

Setting an S-VOL

The following steps describe the procedure to set an S-VOL:

1. From the command prompt, register the array to which you want to set the attribute of the Data Retention Utility feature, then **connect to the array**.
2. Execute the `auluguard` command to set the attribute of the Data Retention Utility feature.
3. An example in which the LU 2 is made unable to be assigned to an S-VOL is shown here.

```
% auluguard -unit array-name -set -lu 2 -svol disable
Are you sure you want to change the access level of logical unit?
(y/n [n]): y
When setting starts, the subsystem stops accepting access to the logical unit
from the host.
Before setting, stop access to the logical unit from the host.
Do you want to continue processing? (y/n [n]): y
The access level of logical unit has been successfully changed.
%
```

When setting up so that it can be specified as an S-VOL, it is specified `-svol enable`.

4. Execute the `auluguard` command to confirm whether an attribute has been set. An example is shown below.

```
% auluguard -unit array-name -refer
Expiration Lock = OFF
  LUN  Attribute  Capacity  S-VOL  Retention Term  Mode
    0  Can't Guard   1.0 GB   ---
    1  Read/Write   2.0 MB  Disable    0 days         ---
    2  Read/Write   2.0 MB  Disable    ---            ---
%
```

Setting S-VOL Disable

The following steps describe the procedure to set S-VOL Disable:

1. From the command prompt, register the array to which you want to set the attribute of the Data Retention Utility feature, then connect to the array.
2. Execute the `auluguard` command to set the attribute of the Data Retention Utility feature.

An example in which the a volume (LU) 2 is made unable to be assigned to an S-VOL is shown here.

```
% auluguard -unit array-name -set -lu 2 -svol disable
Are you sure you want to change the access level of logical unit? (y/n [n]): y
When setting starts, the subsystem stops accepting access to the logical unit from the host.
Before setting, stop access to the logical unit from the host.
Do you want to continue processing? (y/n [n]): y
The access level of logical unit has been successfully changed.
%
```

To set up the volume to be specified as an S-VOL, specify `-svol enable`.

3. Execute the `auluguard` command to confirm whether an attribute has been set. An example is shown below.

```
% auluguard -unit array-name -refer
Expiration Lock = OFF
LUN  Attribute      Capacity  S-VOL  Retention Term  Mode
  0  Can't Guard      1.0 GB   ---    ---            ---
  1  Read/Write        2.0 MB   Disable 0 days         ---
  2  Read/Write        2.0 MB   Disable ---            ---
%
```

Changing the retention term



NOTE: Data Retention Utility cannot shorten the Retention Term.

To change the retention term:

1. From the command prompt, register the array in which you will set the Data Retention Utility attribute. **Connect to the array.**
2. Execute the `auluguard` command to set the Data Retention Utility attribute.
3. The following is an example of changing the LU 1 retention term. Specify it as the `-term` option on years (0 to 60) and days (0 to 21,900).

```
% auluguard -unit array-name -set -lu 1 -term 0 1
Are you sure you want to change the retention term of logical unit?
(y/n [n]): y
The retention term of logical unit has been successfully changed.
%
```

4. Execute the `auluguard` command to confirm that an attribute has been set. An example is shown below.

```
% auluguard -unit array-name -refer
Expiration Lock = OFF
LUN  Attribute      Capacity  S-VOL  Retention Term  Mode
  0  Can't Guard      1.0 GB   ---    ---            ---
  1  Protect          2.0 MB   Disable 1 days         ---
  2  Read/Write        2.0 MB   Disable ---            ---
%
```

Setting the expiration lock

To set the expiration lock:

1. From the command prompt, register the array in which you will set the Data Retention Utility attribute. **Connect to the array.**
2. Execute the auluguard command to set the Data Retention Utility attribute.

```
% auluguard -unit array-name -set -exlock on
Are you sure you want to set the expiration lock to ON?
(y/n [n]): y
If the expiration lock is set to ON, you cannot change access level of the
logic
al unit to Read/Write after the retention term expires. Are you sure?
(y/n [n]): y
The expiration lock has been set successfully.
%
```

Execute the auluguard command to confirm that an attribute has been set.
An example is shown below.

```
% auluguard -unit array-name -refer
Expiration Lock = ON
  LUN  Attribute  Capacity  S-VOL  Retention Term  Mode
    0  Can't Guard   1.0 GB   ---      ---             ---
    1  Protect      2.0 MB  Disable  1 days          ---
    2  Read/Write    2.0 MB  Disable  ---             ---
%
```

LUN Manager (Fibre Channel)

When following the command-line examples in this appendix, be sure to replace the parameters shown with the correct parameters for your systems.

This section includes the following:

- [Installing](#)
- [Enabling or disabling](#)
- [Creating a host group](#)
- [Setting a host group option](#)
- [Setting logical units \(LU mapping\)](#)
- [Adding WWNs](#)
- [Changing a host group name](#)
- [Initializing the host group 0](#)
- [Changing a WWN nickname](#)
- [Deleting a detected WWN](#)

Installing

The **LUN Manager** option is usually not selected (locked). To make this option available, you must install LUN Manager and make its functions selectable (unlocked). To install this function, use the required key code or key file provided with the optional feature.

LUN Manager is installed and uninstalled through Storage Navigator Modular 2. Before installing and uninstalling, make sure that the array is in normal operating condition. If a failure such as a controller blockade has occurred, installation and un-installation operations cannot be performed.

To install the LUN Manager feature using the CLI version of Storage Navigator Modular 2:

1. From the command prompt, register the array in which you will install the LUN Manager feature. Connect to the array.
2. Install the optional features by executing the `auopt` command as follows:

```
% auopt -unit array-name -lock off -keycode manual-attached-keycode
Are you sure you want to install the option?
(y/n [n]): y
The option is unlocked successfully.
%

% auopt -unit array-name -refer
Option Name      Type      Term      Status
  Reconfigure Memory Status
LUN-MANAGERPermanent ---      Enable
      N/A
%
```

Uninstalling

To uninstall LUN Manager, use the key code provided. After uninstalling LUN Manager, the software is locked and not available until it is installed by a key code or key file. When disabling or uninstalling LUN Manager, you must first disable the host group security for all ports.

LUN Manager is installed and uninstalled through Storage Navigator Modular 2.

To uninstall LUN Manager using the CLI version of Storage Navigator Modular 2:

1. From the command prompt, register the array in which you will uninstall the LUN Manager feature and connect to the array.
2. Uninstall the optional features by executing the `auopt` command as follows:

```
% auopt -unit array-name -lock on -keycode manual-attached-keycode
Are you sure you want to de-install the option?
(y/n [n]): y
The option is unlocked successfully.
%

% auopt -unit array-name -refer
DMEC002015: No information displayed.
%
```

Enabling or disabling

LUN Manager can be set to enable or disable after installation. This allows LUN Manager to be activated or deactivated without using a key code or key file. When disabling or uninstalling this LUN Manager feature, you must disable the host group security for all ports.

To enable /disable LUN Manager using the CLI version of Storage Navigator Modular 2:

1. From the command prompt, register the array in which you will change the status of the LUN Manager feature and connect to the array.
2. Execute the `auopt` command to change the status (enable or disable) of the LUN Manager feature.

The following is an example of how to change the status from enable to disable. To change the status from disable to enable, enter enable after the `-st` option.

```
% auopt -unit array-name -option LUN-MANAGER -st disable
Are you sure you want to disable the option?
(y/n [n]): y
The option has been set successfully.
%

% auopt -unit array-name -refer
Option Name      Type      Term      Status
Reconfigure Memory Status

LUN-MANAGER      Permanent ---      Disable
N/A
%
```

Adding a host group

To create a host group for each port, you must:

1. Set the host group security to enable for each port
2. Create a host group

Setting the host group security

The host group default setting is **disable** for each port.

To set the host group Security to be valid or invalid:

1. From the command prompt, register the array in which you want to set the host group security information and connect to the array.
2. Execute the `auhgwwn` command to specify the array.
3. Use the following settings:
 - Array name: HUS
 - Controller: 0
 - Port: A

Use **off** with **-hgs** option, when disabled LUN Manager is changed.

```
% auhgwwn -unit hus100 -set -hgs 0 A on
Are you sure you want to enable the host group security on port0A?
(y/n [n]): y
When setting starts, the subsystem stops accepting access to the port from
the host.
Before setting, stop access to the port from the host.
Do you want to continue processing? (y/n [n]): y
The security information has been set successfully.
%
```

Specify as shown, when the checking information has been set:

```
% auhgwwn -unit hus100 -refer
Port 0A Host Group Security ON
Detected WWN
Name
Assigned WWN
Name
Assignable WWN
Name
Port 0B Host Group Security OFF
Port 1A Host Group Security OFF
Port 1B Host Group Security OFF
%
```

Port Name	Host Group
Port 0A	Host Group
Port 0B	Host Group
Port 1A	Host Group
Port 1B	Host Group

Creating a host group

To create host groups for each Port:

1. From the command prompt, register the array in which you want to set the host group information and connect to the array.
2. Execute the `auhgdef` command to specify the array.
3. Use the following settings:
 - Array name: ams2300
 - Controller: 0
 - Port: A

- Host group number: 1
- Host group name: win001

```
% auhgdef -unit ams2300 -add 0 A -gno 1 -gname win001
Host group information has been set successfully.
%
```

4. Specify as shown, when setting the following information:

```
% auhgdef -unit ams2300 -refer
Port 0A
Group Host Group Name
0 G000
1 win001
Port 0B
Group Host Group Name
0 G000
Port 1A
Group Host Group Name
0 G000
Port 1B
Group Host Group Name
0 G000
%
```

Setting a host group option

To set a host group option for each host group:

1. From the command prompt, register the array in which you want to set the host group option information and connect to the array.
2. Execute the auhgopt command to specify the array. Use the following settings:
 - Array name: HUS100
 - Controller: 0
 - Port: A
 - Host group number: 1
 - Host Connection Mode 1: Standard
 - Host Connection Mode 2: HP-UX Mode

```
% auhgopt -unit ams2300 -set 0 A -gno 1 -HostConnection standard -HP enable

Are you sure you want to set the host group option? (y/n [n]): y
When setting starts, the subsystem stops accepting access to the host group
from
the host.
Before setting, stop access to the host group from the host.
Do you want to continue processing? (y/n [n]): y
The host group option has been set successfully.
%
```

Setting logical units (LU mapping)

To set Logical Units to be recognized by each host to each host group:

1. From the command prompt, register the array in which you want to set the logical unit mapping information and connect to the array.
2. Execute the
3. auhgmap command to specify the array.
4. Use the following settings:

- Array name: HUS100
- Controller: 0
- Port: A
- Host group number: 1
- Logical unit to be recognized by the host: 0
- Array
- internal logical unit: 0

```
% auhgmap -unit hus100 -add 0 A 1 0 0
Are you sure you want to add the mapping information?
(y/n [n]): y
The mapping information has been set successfully.
%
```

5. Specify as shown, when setting the following information:

```
% auhgmap -unit hus100 -refer
Mapping mode = ON
Port Group H-LUN LUN
0A 001:win001 0 0
%
```

Adding WWNs

The WWNs of HBAs are set to each host group (see following section, *Adding a WWN*).

When a Port is connected to a host, WWNs of HBAs that are listed in **Detected WWN** can be selected and added to the host group (see [Selecting and adding an assignable WWN on page A-85](#)).

Adding a WWN

To add a WWN:

1. From the command prompt, register the array in which you want to set the WWN information and connect to the array.
2. Execute the
3. auhgwn command to specify the array.
4. Use the following settings:
 - Array name: HUS100
 - Controller: 0
 - Port: A
 - Host group number: 1
 - Host information (port name): 200000e069402a08
 - WWN nickname: win001

```
% auhgwn -unit ams2300 -set -permhg 0 A 200000e069402a08 -wname win001
-gno 1
The security information has been set successfully.
%
```

5. Specify the following information:

```
% auhgwwn -unit hus100 -refer
Port 0A Host Group Security ON
Detected WWN
Name
Assigned WWN
Name
win001
Assignables WWN
Name
Port 0B Host Group Security OFF
Port 1A Host Group Security OFF
Port 1B Host Group Security OFF
%
```

Port Name	Host Group
200000E069402A08	001:win001

Selecting and adding an assignable WWN

To display the Assignable WWN list and to assign the WWN on the Assignable WWN list:

1. From the command prompt, register the array in which you want to set the WWN information and connect to the array.
2. Execute the auhgwwn command to specify the array. Use the following settings:
 - Array name: HUS100
 - Controller: 0
 - Port: A
 - Host group number: 0

```
% auhgwwn -unit hus100 -refer -permhg 0 A -gno 0
Port 0A Host Group Security ON
Assigned WWN
Name
Assignables WWN
Name
Port Name
10000000C9290680

% auhgwwn -unit hus100 -assign -permhg 0 A 10000000C9290680 -gno 0
The security information has been set successfully.

% auhgwwn -unit hus100 -refer -permhg 0 A -gno 0
Port 0A Host Group Security ON
Assigned WWN
Name
Assignables WWN
Name
Port Name
10000000C9290680
Host Group
000:G000
Port Name
```

Changing a host group name

To change a Host Group name:

1. From the command prompt, register the array in which you want to change the host group name and connect to the array.
2. Execute the auhgdef command to specify the array.
3. Use the following settings:
 - Array name: HUS100
 - Controller: 0
 - Port: A
 - Host group number: 1
 - New host group name: win00

```
% auhgdef -unit hus100 -chg 0 A -gno 1 -newgname win002
Are you sure you want to change the name of host group? (y/n [n]): y
Host group information has been set successfully.
%
```

Deleting a host group

To delete a host group:

1. From the command prompt, register the array in which you want to delete the host group and connect to the array.
2. Execute the auhgdef command to specify the array. Use the following settings:

- Array name: HUS100
- Controller: 0
- Port: A
- Host group number: 1

```
% auhgdef -unit hus100 -rm 0 A -gno 1
Are you sure you want to delete specified host group(s)? (y/n [n]): y
After setting, access from hosts associated with the host group will be
denied.
Do you want to continue processing? (y/n [n]): y
When setting starts, the subsystem stops accepting access to the host group
from
the host. Do you want to continue processing? (y/n [n]): y
Host group information has been set successfully.
%
```

Initializing the host group 0

To initialize the Host Group 0:

1. From the command prompt, register the array in which you want to initialize the specified host group 0 and connect to the array.
2. Execute the auhgdef command to specify the array. Use the following settings:

- Array name: HUS100
- Controller: 0
- Port: A

```
% auhgdef -unit hus100 -init 0 A
Are you sure you want to initialize host group 0? (y/n [n]): y
After setting, access from hosts associated with the host group 0 will be
denied. Do you want to continue processing? (y/n [n]): y
When setting starts, the subsystem stops accepting access to the host group
from the host. Do you want to continue processing? (y/n [n]): y
Host group information has been set successfully.
%
```

Changing a WWN nickname

To change a WWN nickname:

1. From the command prompt, register the array in which you want to change the WWN information and connect to the array.

- Execute the `auhgwwn` command to specify the array. Use the following settings:

- Array name: HUS100
- Controller: 0
- Port: A
- Host
- group number: 1
- Host information (port name): 200000e069402a08
- WWN nick name: winNT01

```
%auhgwwn -unit hus100 -chg -rename 0 A 200000e069402a08 -gno 1 -newwwname
winNT01
The security information has been set successfully.
%
```

- Specify as shown when setting the following information:

```
% auhgwwn -unit hus100 -refer
Port 0A Host Group Security ON
Detected WWN
Name
Assigned WWN
Name
winNT01
Assignnable WWN
Name
Port 0B Host Group Security OFF
Port 1A Host Group Security OFF
Port 1B Host Group Security OFF
%
```

Port Name	Host Group
200000E069402A08	001:win001

Deleting a WWN

To delete the WWN on the assigned WWN list:

- From the command prompt, register the array in which you want to delete the WWN information and connect to the array.
- Execute the `auhgwwn` command to specify the array. Use the following settings:

- Array name: HUS100
- Controller: 0
- Port: A
- Host
- group number: 0
- Host information (port name): 200000e069402a08

```
% auhgwwn -unit hus100 -rm -permhg 0 A 200000e069402a08 -gno 0
The security information has been set successfully.
%
```

- Specify as shown when setting the following information:

```
% auhgwwn -unit hus100 -refer -permhg 0 A -gno 0
Port 0A Host Group Security ON
Assigned WWN
Name
Assignnable WWN
Port Name
Host Group
```

Name	Port Name
%	200000E069402A08

Deleting a detected WWN

To display and delete the detected WWN on the detected WWN list:

1. From the command prompt, register the array in which you want to delete the WWN information and connect to the array.
2. Execute the `auhgwwn` command to specify the array.
 - Use the following settings:
 - Array name: HUS100
 - Controller: 0
 - Port: A
 - Host information (port name): 200000e069402a08

```
% auhgwwn -unit hus100 -refer -login 0 A
Port 0A Host Group Security ON
Detected WWN
  Name      Port Name
  Linux     200000E069402A08
           10000000C9290680
%
% auhgwwn -unit hus100 -rm -perm 0 A 200000e069402a08
Are you sure you want to delete selected WWN? (y/n [n]): y
The security information has been set successfully.
%
```

LUN Manager (iSCSI)

This section includes the following:

- [Creating targets](#)
- [Setting the target security](#)
- [Adding a target](#)
- [Setting logical units](#)
- [Adding an initiator](#)
- [Changing target information](#)
- [Deleting a target](#)
- [Initializing target 000](#)
- [Changing initiator information](#)
- [Deleting an initiator](#)
- [Adding a CHAP user](#)
- [Changing CHAP user information](#)



NOTE: When following the command-line examples in this appendix, be sure to replace the parameters shown with the correct parameters for your systems.

Creating targets

To create a target for each port, you must create a target:

Using LUN Manager, you must connect a port of the array to a host using the switching-hub or connecting the host directly to the port, and then sets a data input/output path between the host and the logical unit. This setting specifies which host can access which logical unit.

To set a data input/output path, the hosts that are authorized to access the logical unit must be classified as a target. That target is then set to the port.

For example, when a Windows® Host (initiator iSCSI Name A) and a Linux Host (initiator iSCSI Name B) are connected to Port A, you must create targets of logical units to be accessed from the Windows® Host (initiator iSCSI Name A) and by the Linux Host (initiator iSCSI Name B).

Set a **Target** option (Host Connection Mode) to the newly created target to confirm the setting.

Setting the target security

The target security default is set to **disable** for each port.

To enable or disable the target security for each port:

1. From the command prompt, register the array in which you want to set the target security information and connect to the array.
2. Execute the autargetini command to specify the array. Use the following settings:
 - Array name: **HUS100**
 - Controller: **0**
 - Port: **A**
 - Use off with -tgs option, when disabled LUN Manager is changed.

```
% autargetini -unit hus100 -set 0 A -tgs on
Are you sure you want to enable the target security on port0A?
(y/n [n]): y
When setting starts, the subsystem stops accepting access to the port from the host.
Before setting, stop access to the port from the host.
Do you want to continue processing? (y/n [n]): y
The target security has been changed successfully.
%
```

3. Specify when the information has been set:

```
% autargetini -unit hus100 -refer
Port 0A Target Security ON Target Name iSCSI Name
Port 0B Target Security OFF
Port 1A Target Security OFF
Port 1B Target Security OFF
%
```

Adding a target

To create targets for each port:

1. From the command prompt, register the array in which you want to set the target information and connect to the array.
2. Execute the autargetdef command to specify the array.
3. Use the following settings:
 - Array name: **HUS100**
 - Controller: **0**
 - Port: **A**
 - Target number: **1**
 - Target 1 alias: **win001**
 - Target 1 iSCSI name: **iqn.hus100-1**
 - Authentication Method: **None**
4. Specify the -talias option for the tail end.

```
% autargetdef -unit hus100-add 0 A -tno 1 -iname iqn.hus100-1 -authmethod
None -talias win001
-authmethod None -talias win001
Are you sure want to add the target?
(y/n [n]): y
The target has been added successfully.
%
```

5. Specify when the information has been set:

```
% autargetdef -unit hus100 -refer
Port 0A
    Target
    ation
    000:T000
    Authentication Method CHAP Algorithm Mutual
    CHAP, None MD5 Authentic
    User Name : ---
    iSCSI Name : iqn.1994-04.jp.co.hitachi:rsd.d9a.t.00007.0a000
    001: win001 None ---
    User Name : ---
    iSCSI Name : iqn.hus100-1
Port 0B
    Target
    ation
    :
    :
    %
```

Setting logical units

The following procedure describes how to set logical units to be recognized by each host to each target. This process is called logical unit mapping.

1. From the command prompt, register the array in which you want to set the logical unit mapping information and connect to the array.
2. Execute the autargetmap command to specify the array.
3. Use the following settings:
 - Array name: **HUS100**
 - Controller: **0**
 - Port: **A**
 - Target number: **1**
 - Logical unit to be recognized by the host: **0**
 - Array internal logical unit: **0**

```
% autargetmap -unit hus100 -add 0 A 1 0 0
Are you sure you want to add the mapping information?
(y/n [n]): y
The mapping information has been set successfully.
%
```

4. Specify when the information has been set:

```
% autargetmap -unit hus100 -refer
Mapping Mode = ON
Port Target H-LUN LUN
0A 001:win001 0 0
%
```

Adding an initiator

The iSCSI Name of each HBA is set to each target and is used to identify hosts.

When a port is connected to a host, an iSCSI name of an HBA listed in **Detected Initiator** can be selected and added to the target.

1. From the command prompt, register the array in which you want to set the initiator information and connect to the array.
2. Execute the autargetini command to specify the array. Use the following settings:
 - Array name: HUS100
 - Controller: 0
 - Port: A
 - Target number: 1
 - Initiator name: Linux
 - Initiator iSCSI Name: iqn.1991-05.com

```
%autargetini -unit hus100 -add 0 A -tno 1 -iname iqn.1991-05.com -ininame
Linux
Are you sure you want to add the initiator information?
(y/n [n]): y
The initiator information has been added successfully.
%
```

Changing target information

To change target information:

1. From the command prompt, register the array in which you want to change the target information and connect to the array.
2. Execute the autargetdef command to specify the array. Use the following settings:
 - Array name: **hus100**
 - Controller: **0**
 - Port: **A**
 - Target number: **1**
 - New target alias: **win002**

```
% autargetdef -unit hus100 -chg 0 A -tno 1 -newtalias win002
Are you sure you want to change the target information?
(y/n [n]): y
After setting except Alias, access from hosts associated with the target will
be
denied.
Do you want to continue processing? (y/n [n]): y
When setting starts, the subsystem stops accepting access from its related
hosts
to the target abnormally.
Before setting, be sure to stop access from the hosts to the target.
Do you want to continue processing? (y/n [n]): y
The target information has been changed successfully.
%
```

Deleting a target

To delete a target:

1. From the command prompt, register the array in which you want to delete the target and connect to the array.
2. Execute the autargetdef command to specify the array. Use the following settings:

- Array name: HUS100
- Controller: 0
- Port: A
- Target number: 1

```
% autargetdef -unit hus100 -rm 0 A -tno 1
Are you sure you want to delete the target(s)?
(y/n [n]): y
After setting, access from hosts associated with the target will be denied.
Do you want to continue processing? (y/n [n]): y
When setting starts, the subsystem stops accepting access from its related
hosts
to the target abnormally.
Do you want to continue processing? (y/n [n]): y
The target(s) have been deleted successfully.
%
```

Initializing target 000

To initialize Target 000:

1. From the command prompt, register the array in which you want to initialize the specified Target 0 and connect to the array.
2. Execute the autargetdef command to specify the array. Use the following settings:

- Array name: HUS100
- Controller: 0
- Port: A

```
% autargetdef -unit hus100 -init 0 A
Are you sure you want to initialize target 000?
(y/n [n]): y
After setting, access from hosts associated with the target 000 will be
denied.
Do you want to continue processing? (y/n [n]): y
When setting starts, the subsystem stops accepting access from its related
hosts
to the target abnormally.
Do you want to continue processing? (y/n [n]): y
The target 000 has been initialized successfully.
%
```

Changing initiator information

To change initiator information:

1. From the command prompt, register the array in which you want to change the initiator information and connect to the array.
2. Execute the autargetini command to specify the array. Use the following settings:

- Array name: **HUS100**

- Controller: **0**
- Port: **A**
- Current Initiator iSCSI Name: **Linux**
- New Initiator Initiator iSCSI Name: **Linux 001**

```
%autargetini -unit hus100 -chg 0 A -iname Linux -newininame Linux001
Are you sure you want to change the initiator information?
(y/n [n]): y
The initiator information has been changed successfully.
%
```

Deleting an initiator

To delete an initiator:

1. From the command prompt, register the array in which you want to delete the initiator and connect to the array.
2. Execute the autargetini command to specify the array. Use the following settings:
 - Array name: **HUS100**
 - Controller: **0**
 - Port: **A**
 - Target number: **1**
 - Initiator iSCSI name: **Linux**

```
%autargetini -unit hus100 -rm 0 A -tno 1 -iname Linux
Are you sure you want to delete the initiator information?
(y/n [n]): y
The initiator information has been deleted successfully.
%
```

Adding a CHAP user

To add a CHAP user:

1. From the command prompt, register the array in which you want to add the CHAP User and connect to the array.
2. Execute the auchapuser command to specify the array. Use the following settings:
 - Array name: **HUS100**
 - Controller: **0**
 - Port: **A**
 - Target number: **1**
 - CHAP user name: **mng001**

```
%auchapuser -unit hus100 -add 0 A -user mng001 -tno 0
Are you sure you want to add the CHAP user information?
(y/n [n]): y
Please input Secret.
Secret: authentication-password
Re-enter Secret: authentication-password
The CHAP user information has been added successfully.
%
```

Changing CHAP user information

To change CHAP User information:

1. From the command prompt, register the array in which you want to change the CHAP User information and connect to the array.
2. Execute the auchapuser command to specify the array. Use the following settings:

- Array name: **HUS100**
- Controller: **0**
- Port: **A**
- CHAP user name: **mng001**
- Current assigned target number: **0**
- New assigned target number: **1**

```
%auchapuser -unit hus100 -assign 0 A -user mng001 -tno 1
Are you sure you want to assign the target(s)?
(y/n [n]): y
The target(s) have been assigned successfully.
%
```

Deleting CHAP user

To delete a CHAP user:

1. From the command prompt, register the array in which you want to delete the CHAP User and connect to the array.
2. Execute the auchapuser command to specify the array. Use the following settings:

- Array name: **HUS100**
- Controller: **0**
- Port: **A**
- CHAP user name: **mng001**

```
%auchapuser -unit hus100 -rm 0 A -user mng001
Are you sure you want to delete the CHAP user information?
(y/n [n]): y
The CHAP user information has been deleted successfully.
%
```

Modular Volume Migration

This section provides details on using the CLI for the following volume migration tasks:

- [Installing](#)
- [Enabling or disabling](#)
- [Setting the DMLU](#)
- [Setting a reserved LU](#)
- [Executing Volume Migration](#)
- [Changing the copy pace](#)
- [Confirming Volume Migration pairs](#)
- [Splitting Volume Migration Pairs](#)

Installing

The Volume Migration feature is usually not selected (locked). To make it available, you must install the Volume Migration feature and make its functions selectable (unlocked). **To install this function, the key code or key file provided with the optional feature is required.**

Before installing and uninstalling, make sure that the array is in normal operating condition. If a failure such as a controller blockade has occurred, installation and un-installation operations cannot be performed.

The following procedure describes how to install Volume Migration using Storage Navigator Modular 2 CLI:

1. From the command prompt, register the array in which you will install the Volume Migration feature. Connect to the array.
2. Install the optional features by using the following:

The text in gray displays when the Cache Partition Manager is enabled.

```
% auopt -unit array-name -lock off -keycode manual-attached-keycode
Are you sure you want to install the option?
(y/n [n]): y
When Cache Partition Manager is enabled, if the option using data pool will
be unlocked the default cache partition information will be restored.
Do you want to continue processing? (y/n [n]): y
The option is unlocked successfully.
%

% auopt -unit array-name -refer
Option Name      Type      Term      Status
      Reconfigure Memory Status
VOL-MIGRATION   Permanent ---      Enable
      N/A
%
```

Uninstalling

To uninstall Volume Migration, the key code provided with the optional feature is required. Once uninstalled, Volume Migration cannot be used (locked) until it is again installed using the key code or key file.

The following conditions must be satisfied in order to uninstall Volume Migration. All the Volume Migration pairs must have been released (including the pair whose statuses are Completed or Error). There should be no LUs registered as reserved LUs.

The following procedure describes how to uninstall Volume Migration, using Storage Navigator Modular 2 CLI:

1. From the command prompt, register the array in which you will uninstall the Volume Migration feature. Connect to the array.
2. Uninstall the optional features by using the following:

```
% auopt -unit array-name -lock on -keycode manual-attached-keycode
Are you sure you want to de-install the option?
(y/n [n]): y
The option is de-installed successfully.
%

% auopt -unit array-name -refer
DMEC002015: No information displayed.
%
```

Enabling or disabling

Volume Migration can be enabled or disabled without uninstalling this function. The following procedure describes how to enable or disable Volume Migration without uninstalling this function using the CLI version of Storage Navigator Modular 2.

The following conditions must be satisfied in order to disable Volume Migration. All of the Volume Migration pairs must have been released (including the pair whose statuses are Completed or Error). There should be no LUs registered as reserved LUs.

1. From the command prompt, register the array in which you will change the status of the Volume Migration feature. Connect to the array.
2. Execute the auopt command to change the status (enable or disable) of the Volume Migration feature.

The following example shows how to change the status from enable to disable. To change the status from disable to enable, enter enable after the -st option.

```
% auopt -unit array-name -option VOL-MIGRATION -st disable
Are you sure you want to disable the option?
(y/n [n]): y
The option has been set successfully.
%
```

3. Execute the auopt command to verify that the Volume Migration feature status has changed.

```
% auopt -unit array-name -refer
Option Name      Type      Term      Status
Reconfigure Memory Status
VOL-MIGRATIONPermanent ---      Disable
N/A
%
```

Setting the DMLU

The DMLU (Differential Management Logical Unit) is an exclusive logical unit for storing the differential data during migration and is treated in the same way as the other logical units. The DMLU must be created if it has not been set. However, a logical unit that is set as the DMLU is not recognized by a host (it is hidden).

Set a logical unit with a size of 10 GB minimum as the DMLU. It is recommended that two DMLUs are set with the second one used for mirroring.

To designate DMLUs:

1. From the command prompt, register the array on which you want to create the DMLU and connect to that array.
2. Execute the `audmlu` command to create a DMLU.

This command first displays LUs that can be assigned as DMLUs and later creates a DMLU.

```
% audmlu -unit array-name -availablelist
Available Logical Units
  LUN Capacity   RAID Group  DP Pool RAID Level  Type  Status
    0    10.0 GB           0    N/A    5( 4D+1P)  SAS   Normal
%
% audmlu -unit array-name -set -lu 0
Are you sure you want to set the DM-LU? (y/n [n]): y
The DM-LU has been set successfully.
%
```

3. To release an already set DMLU, specify the `-rm` and `-lu` options in the `audmlu` command.

```
% audmlu -unit array-name -rm -lu 0
Are you sure you want to release the DM-LU?
(y/n [n]): y
The DM-LU has been released successfully.
%
```

The following restrictions apply when Volume Migration, ShadowImage, or SnapShot, TrueCopy, or TCE pairs exist, or SnapShot data pool is defined, or the remote path of TrueCopy or TCE is defined.

- When two DMLUs are set, only one differential management LU can be released.
- When only one DMLU is set, the DMLU cannot be released.

Setting a reserved LU



NOTE: When the mapping mode is disabled, the host cannot access the LU if it has been allocated to the reserved LU. Also when the mapping mode is enabled, the host cannot access the LU if the mapped LU has been allocated to the reserved LU.



WARNING! Systems or applications that use the specified LU may terminate abnormally. Ensure that you stop host access to the LU before performing this operation.

To set a reserved LU for Migration:

1. From the command prompt, register the array to which you want to set a reserve LU, and then connect to the array.
2. Execute the `aumvolmigration` command to set a reserve LU.

```
% aumvolmigration -unit array-name -availablelist -reservelu
Available Logical Units
  LUN Capacity   RAID GroupDP Pool RAID Level Type Status
    0    1.0 GB           0  N/A5( 4D+1P)  SAS  Normal
    1    1.0 GB           0  N/A5( 4D+1P)  SAS  Normal
    2    1.0 GB           0  N/A5( 4D+1P)  SAS  Normal
    3    1.0 GB           0  N/A5( 4D+1P)  SAS  Normal
   10    1.0 GB           1  N/A5( 4D+1P)  SAS  Normal
   11    1.0 GB           1  N/A5( 4D+1P)  SAS  Normal
   12    1.0 GB           1  N/A5( 4D+1P)  SAS  Normal
   13    1.0 GB           1  N/a5( 4D+1P)  SAS  Normal
%
% aumvolmigration -unit array-name -add -lu 10
Are you sure you want to add the reserve LU?
(y/n [n]): y
If the mapping mode is disabled, host will be unable to access. Or if the
mapped
logical unit will be added to the reserve LU when the mapping mode is
enabled, host will be unable to access.
Systems or applications that use the specified logical unit will terminate
abnormally. Please make sure to stop host access to this logical unit before
performing this operation.
Do you want to continue processing? (y/n [n]): y
The reserve LU has been added successfully.
%
```

Deleting the reserved LU

Be careful when the host recognizes the LU that has been used by Volume Migration. After releasing the Volume Migration pair or canceling Volume Migration, delete the reserve LU or change the LU mapping.

To delete the reserved LU:

1. From the command prompt, register the array to which you want to delete the reserve LU, and then connect to the array.
2. Execute the `aumvolmigration` command to delete the reserve LU.

```
% aumvolmigration -unit array-name -rm -lu 10
Are you sure you want to delete the reserve LU?
(y/n [n]): y
The reserve LU has been deleted successfully.
%
```

Executing Volume Migration

To execute Volume Migration:

1. From the command prompt, register the array to which you want to execute the migration, and then connect to the array.
2. Execute the `aumvolmigration` command to execute the migration.
3. Specify an S-VOL to be set as the reserve LU.

```
% aumvolmigration -unit array-name -availablelist -pvol
Available Logical Units
LUN Capacity RAID Group DP PoolRAID Level Type Status
0 1.0 GB 0 N/A5( 4D+1P) SAS Normal
1 1.0 GB 0 N/A5( 4D+1P) SAS Normal
2 1.0 GB 0 N/A5( 4D+1P) SAS Normal
3 1.0 GB 0 N/A5( 4D+1P) SAS Normal
11 1.0 GB 1 N/A5( 4D+1P) SAS Normal
12 1.0 GB 1 N/A5( 4D+1P) SAS Normal
13 1.0 GB 1 N/A5( 4D+1P) SAS Normal
%
% aumvolmigration -unit array-name -create -pvol 0 -svol 10
Are you sure you want to create the pair and start the copy?
(y/n [n]): y
The copy has been started.
%
```



NOTE: Normal is selected for the Copy Pace in standard. If the copying is made in Normal mode when the host I/O load is heavy, the host I/O performance may deteriorate remarkably. Select Slow to prevent the deterioration of the performance. Select Prior only when you want to shorten the time to the completion of the copying in priority to the host I/O performance in the time period when the P-VOL is rarely accessed.

4. Execute the `aumvolmigration` command to display the pair status.

```
% aumvolmigration -unit array-name -refer -pair
Pair
P-VOL S-VOL Capacity Copy Pace Owner Pair Status
0 10 1.0 GB Normal AMS/WMS Completed
%
```

Changing the copy pace

For the copy pace to be changed, a pair must be in the Copy or Waiting status. Normal is selected for the Copy Pace in standard. If the copying is made in Normal mode when the host I/O load is heavy, the host I/O performance may deteriorate remarkably. Select Slow to prevent the deterioration of the performance. Select Prior only when you want to shorten the time to the completion of the copying in priority to the host I/O performance in the time period when the P-VOL is rarely accessed.

To change the copy pace:

1. From the command prompt, register the array to which you want to change the copy pace, and then connect to the array.
2. Execute the `aumvolmigration` command to change the copy pace.

```
% aumvolmigration -unit array-name -chg -pvol 0 -svol 10 -pace slow
Are you sure you want to change the copy pace?
(y/n [n]): y
The copy pace has been changed.
%
```

Confirming Volume Migration pairs

To confirm the Volume Migration pairs:

1. From the command prompt, register the array to which you want to confirm the volume migration pairs, and then connect to the array.
2. Execute the `aumvolmigration` command to confirm the volume migration pairs.

```
% aumvolmigration -unit array-name -refer
Reserve LU
Status LUN Capacity RAID Group DP PoolRAID Level Type
Reserve 10 1.0 GB 1 N/A 5( 4D+1P) SAS

Pair
P-VOL S-VOL Capacity Copy Pace Owner Pair Status
0 10 1.0 GB Slow AMS/WMS Completed
%
```

Splitting Volume Migration Pairs

A pair can be released if it is in the **Completed** or **Error** status. To release the Volume Migration pair:

1. From the command prompt, register the array to which you want to release the volume migration pairs, and then connect to the array.
2. Execute the `aumvolmigration` command to release the volume migration pairs.

```
% aumvolmigration -unit array-name -split -pvol 0 -svol 10
Are you sure you want to split the pair?
(y/n [n]): y
The pair has been split.
%
```

Canceling Volume Migration pairs

A pair can be cancelled if it is in the Copy or Waiting status. The migration cannot be temporarily stopped or resumed once it has been executed. When the migration is canceled and then executed again, Volume Migration copies of all the data again.

To cancel the Volume Migration pairs:

1. From the command prompt, register the array to which you want to cancel the volume migration pairs, and then connect to the array.
2. Execute the `aumvolmigration` command to cancel the volume migration pairs.

```
% aumvolmigration -unit array-name -cancel -pvol 0 -svol 10
Are you sure you want to cancel the copy?
(y/n [n]): y
The copy has been canceled.
%
```

Limitations of Dirty Data Flush Number

The Dirty Data Flush Number is a setting that determines whether to limit the number of process executions for initializing, or *flushing*, the used or, *dirty*, data in the cache to the drive at the same time. This setting is effective when Volume Migration is enabled. If the setting is enabled in an instance when all the LUs in the array are created in the RAID group where the SAS drives in the DP pool are configured with RAID 1 or RAID 1+0, the Dirty Data Flush Number is limited. Also, the Write I/O time increases.

To address these conditions, disable the Dirty Data Flush Number Limit when using Volume Migration. When the Dirty Data Flush Number Limit is enabled in ShadowImage, disable the setting once, and then execute Volume Migration. After completing this task, set the Dirty Data Flush Number Limit to Enabled again.

SNMP Agent Support Function

This section describes the basic operation procedures for SNMP Agent Support Function. The following sections are included:

- [Installing](#)
- [Enabling or disabling](#)
- [Registering or referencing SNMP environment information](#)

Installing

The SNMP Agent Support Function is usually non-selectable (locked); to make it available, you must install the SNMP Agent Support Function and make its functions selectable (unlocked). To install this function, an option key code or key file provided with the optional feature is required.

The SNMP Agent Support Function is installed and uninstalled using Storage Navigator Modular 2.



NOTE: Before installing and uninstalling, make sure that the array is in normal operating condition. If a failure such as a controller blockade has occurred, installation and un-installation operations cannot be performed.

1. From the command prompt, register the array in which you will install the SNMP Agent Support Function feature. Connect to the array.
2. Install the optional features by using the following examples:

```
% auopt -unit array-name -lock off -keycode manual-attached-keycode
Are you sure you want to install the option?
(y/n [n]): y
The option is unlocked.
%

% auopt -unit array-name -refer
Option Name      Type      Term      Status
Reconfigure Memory Status
SNMP-AGENTPermanent ---      Enable
N/A
%
```

Uninstalling

The following steps describe SNMP Agent Support Function un-installation using the CLI version of Storage Navigator Modular 2:

1. From the command prompt, register the array in which you will uninstall the SNMP Agent Support Function feature. Connect to the array.
2. Uninstall the optional features by using the either of the following examples:

```
% auopt -unit array-name -lock on -keycode manual-attached-keycode
Are you sure you want to de-install the option?
(y/n [n]): y
The option is de-installed successfully.
%

% auopt -unit array-name -refer
DMEC002015: No information displayed.
%
```

Enabling or disabling

The SNMP Agent Support Function can be enabled or disabled without un-installation. The following instructions describe how to enable or disable it without un-installation using the CLI version of Storage Navigator Modular 2.

1. From the command prompt, register the array in which you will change the SNMP Agent Support Function status. Connect to the array.
2. Execute the auopt command to change the status (enable or disable).
3. To change the status from
4. **disable** to **enable**, enter “enable” after the –st option, and see the following examples:

```
% auopt -unit array-name -option SNMP-AGENT -st disable
Are you sure you want to disable the option?
(y/n [n]): y
The option has been set successfully.
%

% auopt -unit array-name -refer
Option Name      Type      Term      Status
Reconfigure Memory Status
SNMP-AGENTPermanent ---      Disable
N/A
%
```

Registering or referencing SNMP environment information

To register an array in which you want to enable SNMP Agent Support feature:

1. From the command prompt, register the array in which you want to set the SNMP Agent Support Function. Connect to the array.
2. Execute the ausnmp command to specify the array.

```
% ausnmp -unit array-name -set -config config.txt -name name.txt
The SNMP environment information has been set successfully.
%
```

To reference an array:

1. From the command prompt, register the array in which you want to set the SNMP Agent Support Function. Connect to the array.
2. Execute the ausnmp command to specify the array.

```
% ausnmp -unit array-name -get -config config.txt -name name.txt
Are you sure you want to save the SNMP environment information to the file? (y/n [n]): y
The SNMP environment information has been saved to the file successfully.
%
```

Fibre Channel Option

This section describes the basic operation procedures for the Fibre Channel Option. For a full description of the Fibre Channel option, see the Hitachi Unified Storage User's Guide. The following sections are included:

- [Installing](#)
- [Uninstalling](#)
- [Enabling or Disabling](#)
- [Confirming after Installation](#)

Installing

Fibre Channel Option feature is usually un-selectable (locked); to make it available, you must install Fibre Channel Option feature and make its functions selectable (unlocked). To install this function, the key code or key file provided with the optional feature is required.

Follow the instructions below to install Fibre Channel Option feature. Fibre Channel Option is installed and uninstalled using the CLI version of Navigator 2.



NOTE: The following are notes to consider for installing the Fibre Channel option:

- Installing, uninstalling, enabling, and disabling of Fibre Channel Option feature are set for each disk array.
 - Before installing and uninstalling, make sure that the disk array is in normal operating condition. If a failure such as a controller blockade has occurred, installation and un-installation operations cannot be performed.
-

The following instructions describe how to install Fibre Channel Option, using the CLI version of Navigator 2:

1. From the command prompt, register the disk array in which you will install Fibre Channel Option feature. Connect to the disk array.
2. Install the optional feature by using the following:

```
% auopt -unit array-name -lock off -keycode manual-attached-keycode
Are you sure you want to unlock the option? (y/n [n]): y
The option is unlocked.
%

% auopt -unit array-name -refer
Option NameType      Term      Status
Reconfigure Memory Status
FC-OPTIONPermanent ---      Enable
N/A
%
```

The Fibre Channel Option is installed and the status is "Enable". Installation of Fibre Channel Option is now complete.

Uninstalling

Follow the instructions below to uninstall Fibre Channel Option. When it is uninstalled, Fibre Channel Option is not available (locked) until it is installed by the key code.

To uninstall Fibre Channel Option, the key code provided with the Fibre Channel Option feature is required. Follow the instructions below to uninstall Fibre Channel Option.

1. From the command prompt, connect the disk array in which you will uninstall Fibre Channel Option feature.
2. Uninstall the optional features by using the following:

```
% auopt -unit array-name -lock on -keycode manual-attached-keycode
Are you sure you want to lock the option? (y/n [n]): y
When the option to lock is Fibre Channel Option, it becomes unusable from PortA to PortD.
Please make sure that Fibre Channel Cable is not connected to these ports.
Do you want to continue processing? (y/n [n]): y
The option is locked.
%

% auopt -unit array-name -refer
DMEC002015: No information displayed.
%
```

Enabling or Disabling

Fibre Channel Option feature can be set to Disable or Enable depending on the conditions in which the feature has been installed. The following paragraphs describe a CLI procedure for setting the feature to Disable or Enable while Fibre Channel Option feature stays in an installed state.

1. From the command prompt, connect the `disk` array in which you will change the status of Fibre Channel Option feature.
2. Execute the `auopt` command to change the status (enable or disable) of Fibre Channel Option feature.

The following is an example of how to change the status from enable to disable. To change the status from disable to enable, enter `enable` after the `-st` option.

```
% auopt -unit array-name -option FC-OPTION -st disable
Are you sure you want to disable the option? (y/n [n]): y
After you disable Fibre Channel Option, it becomes unusable from PortA to PortD.
Please make sure that Fibre Channel Cable is not connected to these ports.
Do you want to continue processing? (y/n [n]): y
The option has been set successfully.
%
```

3. Execute the `auopt` command to verify that Fibre Channel Option feature status has changed.

```
% auopt -unit array-name -refer
Option NameType   Term   Status
Reconfigure Memory Status
FC-OPTIONPermanent ---   Disable
N/A
%
```

Confirming after Installation

To confirm the Host Connectors status:

1. From the command prompt, connect the disk array in which you will display the status of Host Connectors.
2. Execute the `auparts` command to display Host Connectors information. The example is shown below.

```
% auparts -unit disk array-name
Controller
  CTL    Status
   0     Normal
   1     Normal

Cache
  CTL    Slot    Capacity(MB)    Status
   0         0         4096     Normal
   1         0         4096     Normal

Interface Board
  CTL    Interface Board    Type    Status
   0         1 Fibre Channel    Normal
   1         1 Fibre Channel    Normal

Battery
  Battery    Status
   0         Normal
   1         Normal

Host Connector
  Port    Status
   0A     Normal
   0B     Normal
   0C     Normal
   0D     Normal
   1A     Normal
   1B     Normal
   1C     Normal
   1D     Normal

Fan
:
:
%
```

Power Saving

This section describes the basic operation procedures for Power Saving feature. The following sections are included:

Installing

The Power Saving feature is usually unselectable (locked). To make it available, install the Power Saving feature and make its functions selectable (unlocked). To install this function, the key code or key file provided with the optional feature is required.

Follow the instructions below to install the Power Saving feature. You install the feature using Navigator 2.



NOTE: The following are notes to consider for installing the Fibre Channel option:

- Installing, uninstalling, enabling, and disabling of the Power Saving option feature are set for each disk array.
 - Before installing and uninstalling, make sure that the disk array is in normal operating condition. If a failure such as a controller blockade has occurred, installation and un-installation operations cannot be performed.
-

The following instructions describe how to install Power Saving, using the CLI version of Navigator 2.

1. From the command prompt, register the disk array in which you will install the Power Saving feature. Connect to the disk array.
2. Install the optional feature by using the following:

```
% auopt -unit array-name -lock off -keycode manual-attached-keycode
Are you sure you want to unlock the option? (y/n [n]): y
The option is unlocked.
%

% auopt -unit array-name -refer
Option NameType    Term    Status
Reconfigure Memory Status
POWER-SAVING Permanent ---    Enable
N/A
%
```

Power Saving is installed and the status is Enable. Installation of Power Saving is now complete.

Uninstalling

Follow the instructions below to uninstall Power Saving. When it is uninstalled, Power Saving is not available (locked) until it is installed by the key code or key file.

To uninstall Power Saving, the key code or key file provided with the feature is required.

Follow the instructions below to uninstall Power Saving.



NOTE: Ensure that no RAID Group is in a spin-down state before uninstalling Power Saving.

1. From the command prompt, connect the disk array in which you will uninstall the Power Saving feature.
2. Uninstall the optional features by using the following:

```
% auopt -unit array-name -lock on -keycode manual-attached-keycode
Are you sure you want to lock the option? (y/n [n]): y
When the option to lock is Fibre Channel Option, it becomes unusable from PortA to PortD.
Please make sure that Fibre Channel Cable is not connected to these ports.
Do you want to continue processing? (y/n [n]): y
The option is locked.
%

% auopt -unit array-name -refer
DMEC002015: No information displayed.
%
```

Enabling or Disabling

The Power Saving feature can be set to Disable or Enable, depending on the condition in which the feature has been installed.

The following paragraphs describe a CLI procedure for setting the feature to Disable or Enable while the Power Saving feature stays in an installed state.



NOTE: Ensure that no RAID Group is in a spin-down state before uninstalling Power Saving.

1. From the command prompt, connect the disk array in which you will change the status of the Power Saving feature.
2. Execute the auopt command to change the status (enable or disable) of the Power Saving feature.
3. The following is an example of how to change the status from Enable to Disable. To change the status from Disable to enable, enter enable after the -st option.

```
% auopt -unit array-name -option POWER-SAVING -st disable
Are you sure you want to disable the option? (y/n [n]): y
The option has been set successfully.
%
```

4. Execute the auopt command to verify that the Power Saving feature status has changed.

```
% auopt -unit array-name -refer
Option NameType    Term    Status
Reconfigure Memory Status
POWER-SAVING Permanent ---    Disable
N/A
%
```

Displaying Power Saving information

To display Power Saving information:

From the command prompt, connect the disk array in which you will display the status of Power Saving.

Execute the `aupowersave` command to display Power Saving information. The following example details typical information displayed.

```
% aupowersave -unit disk array-name -refer -lu -fmttext
Power Saving Information of RAID Group
Remaining I/O

RAID Group Power Saving StatusMonitorTime[min.]
1 Normal(Spin Up)N/A
2 Power saving(Spin Down) N/A
3 Power saving(Spin Down Excuting) N/A
4 Normal(Command Monitoring) 120
Power Saving Information of Logical Unit
LUN RAID Group Power Saving Status
0 0 Normal
1 0 Normal
2 1 Power saving

%
```

Specifying Spin Down

To spin down the RAID Group:

1. From the command prompt, connect the disk array that the Power Saving feature will spin down.
2. Execute the `aupowersave` command to spin down the specified RAID Group. The following example details typical information displayed.

```
% aupowersave -unit array-name -spindown -rg 4
Are you sure you want specified RAID group(s) to spin down?
(y/n [n]): y
If you spin down the RAID group(s), logical units will stop accepting access from the host.
Please confirm host is not using logical units.
Are you sure you want to spin down the RAID group(s)? (y/n [n]): y
The RAID group(s) will be spun down.
Are you sure you want to execute? (y/n [n]): y
The spin down of RAID group 4 has been required.
The spin down of RAID group(s) have been required successfully.
%
```

3. You can specify the `-powersaving` option instead of the `-spindown` option. In addition, you can specify the `-monitortime` option.

```
% aupowersave -unit array-name -powersaving -rg 4 -monitortime 1
Are you sure you want specified RAID group(s) to be Power Saving state?
(y/n [n]): y
If you change to Power Saving state the RAID group(s), logical units will stop accepting access from the host.
Please confirm host is not using logical units.
Are you sure you want the RAID group(s) to be Power Saving state? (y/n [n]): y
The RAID group(s) will be Power Saving state.
Are you sure you want to execute? (y/n [n]): y
The changing RAID group 4 to Power Saving state has been required.
The changing to Power Saving state has been required successfully.
```

4. When you run a spin-down operation on one RAID Group, check the Power Saving status after the specified minutes or more passed. When you run the spin-down for two or more RAID Groups, check the status after several minutes passed. Take appropriate actions if a phrase other than Normal (Spin Down Failure: Host Command), Normal (Spin Down Failure: Non-Host Command), Normal (Spin Down Failure: Error), or Normal (Spin Down Failure: PS OFF/ON) is displayed.

Specifying Spin Up

To spin up the RAID Group:

1. From the command prompt, connect the disk array that the Power Saving feature will spin down.
2. Execute the `aupowersave` command to spin up the specified RAID Group. The following example display typical information returned from this operation.

```
% aupowersave -unit array-name -spinup -rg 2
Are you sure you want specified RAID group(s) to to spin up?
(y/n [n]): y
The spin up of RAID group 4 has been required.
The spin up of RAID group(s) have been required successfully.
%
```

You can specify the `-normal` option instead of the `-spinup` option.

```
% aupowersave -unit array-name -spinup -rg 4
Are you sure you want to spin up RAID Group to be Normal state?
(y/n [n]): y
The changing RAID group 4 to Normal state has been required.
The changing to Normal state has been required successfully.
%
```

When you refer to the Power Saving Status and see that Normal (Spin Up) displays after a while, the spin-up is complete.

3. Run the `aupowersave` command even if the spin-up operation is not complete. Direct a host to mount the volume included in the RAID Group if the host uses the volume.

Power Saving Plus

This section describes the basic operation procedures for Power Saving Plus feature. The following sections are included:

- [Installing](#)
- [Uninstalling](#)
- [Disabling or Enabling](#)
- [Displaying Power Saving Information](#)
- [Requesting Non I/O-linked Spin Down](#)
- [Requesting I/O-linked Spin Down](#)
- [Requesting I/O-linked Drive Power OFF](#)
- [Requesting I/O-linked Spin Down with Drive Power OFF](#)
- [Requesting Remove Power Saving \(Spin Up\)](#)

Installing

Power Saving Plus is usually un-selectable (locked); to make it available, you must install Power Saving Plus and make its functions selectable (unlocked). To install this function, the key file or key code provided with the optional feature is required.

Before installing and uninstalling, make sure that the disk array is in normal operating condition. If a failure such as a controller blockade has occurred, installation and un-installation operations cannot be performed.

1. From the command prompt, register the disk array in which you will install Power Saving Plus. Connect to the disk array.
2. Execute the `auopt` command to unlock the option. An example of input and results are provided below.

Example of the path to the key file

```
E:\licensekey\PowerSaving Plus\XS\Windows\keyfile
```

E represents the drive letter where CD-ROM or DVD-ROM is used that comes with Power Saving Plus.

```
% auopt -unit array-name -lock off -keycode manual-attached-keycode
Are you sure you want to unlock the option? (y/n [n]): y
The option is unlocked.
%
```

3. Execute the `auopt` command to check if the option is unlocked. An example of input and results are provided below. (The following shows how items are output.)

```
% auopt -unit array-name -refer
Option NameType    Term    Status    Reconfigure Memory Status
PWR-SAVING-PLSPermanent ---    Enable    N/A
%
```

Uninstalling

To uninstall Power Saving Plus, the key code or key file provided with the Power Saving Plus is required. When it is uninstalled, Power Saving Plus is not available (locked) until it is installed by the key code or key file.

You can not uninstall Power Saving Plus if a RAID group exists that is in the following conditions.

- **< Non host I/O link mode >**

Normal (Command Monitoring), Power Saving (Spin Down Executing), Power Saving (Spin Down), Power Saving (Spin Up Executing), Power Saving (Recovering), Power Saving (Health Checking)

- **<Host I/O link mode >**

Normal (Command Monitoring), Power Saving (Spin Down Executing), Power Saving (Spin Down), Power Saving (Power OFF), Power Saving (Spin Up Executing), Power Saving (Recovering), Power Saving (Health Checking)

Follow the instructions below to uninstall Power Saving Plus.

1. From the command prompt, connect the disk array in which you will uninstall Power Saving Plus.
2. Execute the `auopt` command to unlock the option. An example of input and results are provided below.

Example of the path to the key file

```
E:\licensekey\PowerSaving Plus\XSI\Windows\keyfile
```

E represents the drive letter where CD-ROM or DVD-ROM is used that comes with Power Saving Plus.

```
% auopt -unit array-name -lock on -keycode manual-attached-keycode
Are you sure you want to lock the option? (y/n [n]): y
The option is locked.
%
```

3. Execute the `auopt` command to check if the option is unlocked. An example of input and results are provided below. (The following shows how items are output.)

```
% auopt -unit array-name -refer
DMEC002015: No information displayed.
%
```

Disabling or Enabling

Power Saving Plus can be set to Disable or Enable depending on the conditions in which the feature has been installed.

You can not disable Power Saving Plus if a RAID group exists that is in the following conditions.

- **< Non host I/O link mode >**

Normal (Command Monitoring), Power Saving (Spin Down Executing), Power Saving (Spin Down), Power Saving (Spin Up Executing), Power Saving (Recovering), Power Saving (Health Checking)

- **<Host I/O link mode >**

Normal (Command Monitoring), Power Saving (Spin Down Executing), Power Saving (Spin Down), Power Saving (Power OFF), Power Saving (Spin Up Executing), Power Saving (Recovering), Power Saving (Health Checking)

The following paragraphs describe a CLI procedure for setting the feature to Disable or Enable while Power Saving Plus stays in an installed state.

1. From the command prompt, connect the disk array in which you will change the status of Power Saving Plus.
2. Execute the `auopt` command to change the status (enable or disable) of Power Saving Plus.

The following is an example of how to change the status from enable to disable. To change the status from disable to enable, enter `enable` after the `-st` option.

```
% auopt -unit array-name -option PWR-SAVING-PLS -st disable
Are you sure you want to disable the option? (y/n [n]): y
The option has been set successfully.
%
```

3. Execute the `auopt` command to verify that Power Saving Plus status has changed. An example of input and results are provided below. (The following shows how items are output.)

```
% auopt -unit array-name -refer
Option NameType      Term      Status      Reconfigure Memory Status
PWR-SAVING-PLSPermanent ---      Disable      N/A
%
```

Displaying Power Saving Information

To display the specified power saving information in RAID group:

The following instructions describe how to display the power saving information.

1. From the command prompt, connect the disk array in which you will display the power saving information.
2. Execute the `aupowersave` command to display the power saving information. The example is shown below. (The following shows how items are output.)

```
% aupowersave -unit disk array-name -refer -lu -fmttext
Power Saving Information of RAID Group
Remaining I/O

RAID Group Power Saving StatusMonitorTime[min.]
  1 Normal(Spin Up)N/A
  2 Power saving(Command Monitoring)55
  3 Power saving(Spin Down)N/A
  4 Normal(Power OFF)N/A
Power Saving Information of Logical Unit
LUN RAID Group Power Saving Status
  0      0 Normal
  1      1 Normal
  2      2 Power saving

  3      3 Power saving

%
```

3. You can display more detailed information.

```
% aupowersave -unit disk array-name -refer -fmttextio
Power Saving Information of RAID Group
Spin DownPower OFF
RemainingRemainingRemaining
RAID Power Saving      I/OI/OI/OI/OI/OPower
```

Group Status	LinkMonitoring	Monitoring	Monitoring	Monitoring	Saving
	Time [min.]	Time [min.]	Count		
0 Normal(Spin Up)	Disable	N/A	N/A	N/A	A7
1 Normal	Enable	55	60	N/A	A7
(Command Monitoring)					
2 Power saving (Spin Down)	Enable	N/A	10	N/A	A6
3 Normal(Power OFF)	Enable	N/A	10	N/A	A116

%

Requesting Non I/O-linked Spin Down

The following instructions describe how to request non I/O-linked spin down.

1. From the command prompt, connect the disk array in which power saving is to request non I/O-linked spin down.
2. Execute the `aupowersave` command to spin down the specified RAID group. The example is shown below.

The following table shows the option to change the power saving state in the `aupowersave` command.

The command option `-spindown`, `-powersaving`, or `-powersaving_spindown` are specified at instructing the spin down.

Table A-3: `aupowersave` command options

Option	Contents
<code>-spindown</code>	Changes the RAID group to spin down state. Same as <code>-powersaving</code> , <code>-powersaving_spindown</code> option.
<code>-powersaving</code>	Changes the RAID group to spin down state. Same as <code>-spindown</code> , <code>-powersaving_spindown</code> option.
<code>-powersaving_spindown</code>	Changes the RAID group to spin down state. Same as <code>-spindown</code> , <code>-powersaving_spindown</code> option.
<code>-monitortime</code>	Specify the I/O monitoring time by a minute. The time can be specified between 0 to 720 in minutes. (If the time is not specified, it is set to 1 minute, which is the default value of non I/O-linked spin down request.)

```
% aupowersave -unit array-name -spindown -rg 4
Are you sure you want specified RAID group(s) to spin down?
(y/n [n]): y
If you spin down the RAID group(s), logical units will stop accepting access from the host.
Please confirm host is not using logical units.
Are you sure you want to spin down the RAID group(s)? (y/n [n]): y
The RAID group(s) will be spun down.
Are you sure you want to execute? (y/n [n]): y
The spin down of RAID group 4 has been required.
The spin down of RAID group(s) have been required successfully.
%

% aupowersave -unit array-name -powersaving -rg 4 -monitortime 1
Are you sure you want specified RAID group(s) to be Power Saving state?
(y/n [n]): y
If you change to Power Saving state the RAID group(s), logical units will stop accepting access from the
```

```

host.
Please confirm host is not using logical units.
Are you sure you want the RAID group(s) to be Power Saving state? (y/n [n]): y
The RAID group(s) will be Power Saving state.
Are you sure you want to execute? (y/n [n]): y
The changing RAID group 4 to Power Saving state has been required.
The changing to Power Saving state has been required successfully.
%

```

If you specify several RAID groups concurrently, specify those RAID group numbers after the -rg option.

3. If you have request spin down to only one RAID group, check the Power Saving state after the command monitoring time has passed. If you request spin down to several RAID groups, check the Power Saving state after a few minutes.

If the `aupowersave` command (see section Displaying Power Saving Information) displays **Normal (Spin Down Failure: Host Command)**, **Normal (Spin Down Failure: Non-Host Command)**, **Normal (Spin Down Failure: Error)**, or **Normal (Spin Down Failure: PS OFF/ON)** as the Power Saving state, address this according to 4.2.

Requesting I/O-linked Spin Down

The following instructions describe how to request I/O-linked spin down.

1. From the command prompt, connect the disk array in which power saving is to request I/O-linked spin down.
2. Execute the `aupowersave` command to spin down the specified RAID group. The example is shown below.

The following table shows the option to change the power saving state in the `aupowersave` command.

Table A-4: Power Saving state change options

Option	Contents
-iolink	Specify this option when specifying I/O link.
-spindown	Changes the RAID group to spin down state.
-monitortime	Specify the I/O monitoring time by a minute. The time can be specified between 0 to 720 in minutes. (If the time is not specified, it is set to 30 minutes, which is the default value of non I/O-linked spin down request.)

```

% aupowersave -unit array-name -iolink -rg 2 -spindown -monitortime 30
Are you sure you want to execute power saving the RAID group(s)? (y/n [n]): y
When the power saving starts, the access from its related hosts to the volumes may take 1 to 5 minutes.
Are you sure you really want to execute power saving the RAID group(s)? (y/n [n]): y
The RAID group(s) will be power saving state.
Are you sure you want to execute? (y/n [n]): (y/n [n]): y
The power saving execution of RAID group 2 has been required.
The power saving execution has been required successfully.
%

```

If you specify several RAID groups concurrently, specify those RAID group numbers after the -rg option.

Requesting I/O-linked Drive Power OFF

The following instructions describe how to request I/O-linked drive power OFF.

1. From the command prompt, connect the disk array in which Power Saving is to request I/O-linked drive power OFF.
2. Execute the `aupowersave` command to request I/O-linked drive power OFF to the specified RAID group. The example is shown below.

The following table shows the option to change the power saving state in the `aupowersave` command.

Table A-5: Power Saving state change options

Option	Contents
-iolink	Specify this option when specifying I/O link.
-poweroff	Changes the RAID group to power OFF state.
-poweroff_monitortime	Specify the I/O monitoring time of power off by a minute. The time can be specified between 0 to 720 in minutes. (If the time is not specified, it is set to 60 minutes, which is the default value of non I/O-linked spin down request.)

```
% aupowersave -unit array-name -iolink -rg 2 -poweroff -poweroff_monitortime 60
Are you sure you want to execute power saving the RAID group(s)? (y/n [n]): y
When the power saving starts, the access from its related hosts to the volumes may take 1 to 5 minutes.
Are you sure you really want to execute power saving the RAID group(s)? (y/n [n]): y
The RAID group(s) will be power saving state.
Are you sure you want to execute? (y/n [n]): (y/n [n]): y
The power saving execution of RAID group 2 has been required.
The power saving execution has been required successfully.
%
```

If you specify several RAID groups concurrently, specify those RAID group numbers after the `-rg` option.

Requesting I/O-linked Spin Down with Drive Power OFF

The following instructions describe how to request I/O-linked spin down with drive power OFF.

1. From the command prompt, connect the disk array in which Power Saving is to request I/O-linked spin down with drive power OFF.
2. Execute the `aupowersave` command to spin up the specified RAID group. The example is shown below.

The following table shows the option to change the power saving state in the `aupowersave` command.

Table A-6: Power Saving state command options

Option	Contents
-iolink	Specify this option when specifying I/O link.
-spindown	Changes the RAID group to spin down state.

Table A-6: Power Saving state command options

Option	Contents
-poweroff	Changes the RAID group to power OFF state.
-monitortime	Specify the I/O monitoring time by a minute. The time can be specified between 0 to 720 in minutes. (If the time is not specified, it is set to 30 minutes, which is the default value of non I/O-linked spin down request.)
-poweroff_monitortime	Specify the I/O monitoring time of power off by a minute. The time can be specified between 0 to 720 in minutes. (If the time is not specified, it is set to 60 minutes, which is the default value of non I/O-linked spin down request.)

If you request spin down with drive power OFF, the following restriction applies to the I/O monitoring time.

Spin down < Drive power OFF

```
% aupowersave -unit array-name -iolink -rg 2 -spindown -monitortime 30 -poweroff -poweroff_monitortime 60
Are you sure you want to execute power saving the RAID group(s)? (y/n [n]): y
When the power saving starts, the access from its related hosts to the volumes may take 1 to 5 minutes.
Are you sure you really want to execute power saving the RAID group(s)? (y/n [n]): y
The RAID group(s) will be power saving state.
Are you sure you want to execute? (y/n [n]): (y/n [n]): y
The power saving execution of RAID group 2 has been required.
The power saving execution has been required successfully.
%
```

If you specify several RAID groups concurrently, specify those RAID group numbers after the -rg option.

Requesting Remove Power Saving (Spin Up)

The following instructions describe how to request the remove power saving (spin up).

1. From the command prompt, connect the disk array in which you will request the remove power saving (spin up).
2. Execute the aupowersave command to request the remove power saving (spin up). The example is shown below.

The following table shows the option to change the remove power saving (spin up) state in the aupowersave command.

Option	Contents
-spinup	Changes the RAID group to spin up state. Same as -normal option.
-normal	Changes the RAID group to spin up state. Same as -spinup option.

```
% aupowersave -unit array-name -spinup -rg 2
Are you sure you want to spin up RAID Group selected?
(y/n [n]): y
Instructed RAID Group 2 to spin up.
The spin up of RAID group(s) have been required successfully.
%
```

If you see **Normal (Spin Up)** in the Power Saving state after a while, spin up is completed.

If you specify several RAID groups concurrently, specify those RAID group numbers after the `-rg` option.

3. Execute `-fmttext` or `-fmttextio` option in the `aupowersave` command to check if the spin up is completed. (See section Displaying Power Saving Information)



Glossary

This glossary provides definitions of general storage networking terms as well as specific terms related to the technology that supports Hitachi Data Systems products. Click the letter of the glossary section to display that page.

1000BASE-T

A specification for Gigabit Ethernet over copper wire. The standard defines 1 Gbps data transfer over distances of up to 100 meters using four pairs of Category 5 balanced copper cabling and a 5-level coding scheme.

A

Array

A set of hard disks grouped logically together to function as one contiguous storage space.

ATA

Advanced Technology Attachment, a disk drive implementation that integrates the controller on the disk drive.

B

BIOS

Basic Input Output System, built-in software code that determines the functions that a computing device can perform without accessing programs from a disk.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------

Bps

Bits per second, the standard measure of data transmission speeds.

BSD syslog protocol

This protocol has been used for the transmission of event notification messages across networks for many years. While this protocol was originally developed on the University of California Berkeley Software Distribution (BSD) TCP/IP system implementations, its value to operations and management has led it to be ported to many other operating systems as well as being embedded into many other networked devices.

C

Cache

A temporary, high-speed storage mechanism. It is a reserved section of main memory or an independent high-speed storage device. Two types of caching are found in computers: memory caching and disk caching. Memory caches are built into the architecture of microprocessors and often computers have external cache memory. Disk caching works like memory caching; however, it uses slower, conventional main memory that on some devices is called a memory buffer.

Capacity

The amount of information (usually expressed in megabytes) that can be stored on a disk drive. It is the measure of the potential contents of a device; the volume it can contain or hold. In communications, capacity refers to the maximum possible data transfer rate of a communications channel under ideal conditions.

Challenge Handshake Authentication Protocol

A security protocol that requires users to enter a secret for access.

CHAP

See Challenge Handshake Authentication Protocol.

command control interface (CCI)

Hitachi's Command Control Interface software provides command line control of Hitachi array and software operations through the use of commands issued from a system host. Hitachi's CCI also provides a scripting function for defining multiple operations.

command line interface (CLI)

A method of interacting with an operating system or software using a command line interpreter. With Hitachi's Storage Navigator Modular

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Glossary–2

Command Line Interface, CLI is used to interact with and manage Hitachi storage and replication systems.

D

DHCP

Dynamic Host Configuration Protocol, allows a computer to join an IP-based network without having a pre-configured IP address. DHCP is a protocol that assigns unique IP addresses to devices, then releases and renews these addresses as devices leave and re-join the network.

Differential Management Logical Unit (DMLU)

The volumes used to manage differential data in a storage system. In a TrueCopy Extended Distance system, there may be up to two DM logical units configured per storage system. For Copy-on-Write and ShadowImage, the DMLU is an exclusive volume used for storing data when the array system is powered down.

Duplex

The transmission of data in either one or two directions. Duplex modes are full-duplex and half-duplex. Full-duplex is the simultaneous transmission of data in two direction. For example, a telephone is a full-duplex device, because both parties can talk at once. In contrast, a walkie-talkie is a half-duplex device because only one party can transmit at a time.

E

Ethernet

A local area network technology based on packetized transmissions between physical ports over a variety of electrical and optical media.

F

Fabric

The hardware that connects workstations and servers to storage devices in a SAN. The SAN fabric enables any-server-to-any-storage device connectivity through the use of fibre channel switching technology.

FC

Fibre channel.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Firmware

Software embedded into a storage device. It may also be referred to as Microcode.

Full-duplex

The concurrent transmission and the reception of data on a single link.

G

Gbps

Gigabit per second.

GUI

Graphical user interface.

H

HBA

Host bus adapter, a circuit board and/or integrated circuit adapter installed in a workstation or server that provides input/output processing and physical connectivity between a server and a storage device. An iSCSI HBA implements the iSCSI and TCP/IP protocols in a combination of a software storage driver and hardware.

HDD

Hard disk drive.

I

Initiator

A system component that originates an I/O command over an I/O bus or network, such as an I/O adapters or network interface cards.

I/O

Input/output.

IP

Internet Protocol, specifies the format of packets and addressing scheme. Most networks combine IP with a higher-level protocol called Transmission Control Protocol (TCP), which establishes a virtual connection between a destination and a source.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

IP address

An identifier for a computer or device on a TCP/IP network. Networks using the TCP/IP protocol route messages based on the IP address of the destination. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be zero to 255 (for example, 192.168.0.200).

IP-SAN

Block-level Storage Area Networks over TCP/IP using the iSCSI protocol.

iSCSI

Internet SCSI, an IP-based standard for connecting data storage devices over a network and transferring data using SCSI commands over IP networks. iSCSI enables a Storage Area Network to be deployed in a Local Area Network.

iSNS

Internet Storage Name Service, a protocol that allows automated discovery, management and configuration of iSCSI devices on a TCP/IP network.

L

LAN

Local Area Network, a computer network that spans a relatively small area, such as a single building or group of buildings.

LU

Logical unit.

LUN

Logical unit number.

M

Middleware

Software that connects two otherwise separate applications. For example, a middleware product can be used to link a database system to a Web server. Using forms, users request data from the database;

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

then, based on the user's requests and profile, the Web server returns dynamic Web pages to the user.

MIB

Message Information Block.

N

NIC

Network Interface Card, an expansion board in a computer that allows the computer to connect to a network.

NTP

Network Time Protocol, a protocol for synchronizing the clocks of computer systems over packet-switched, variable-latency data networks. NTP uses UDP port 123 as its transport layer. It is designed particularly to resist the effects of variable latency (jitter).

P

Pool volume

A pool volume is used to store backup versions of files, archive copies of files, and files migrated from other storage.

primary volume (P-VOL)

The storage volume in a volume pair. It is used as the source of a copy operation. In copy operations a copy source volume is called the P-VOL while the copy destination volume is called S-VOL (secondary volume).

R

RAID

Redundant Array of Independent Disks, a disk array in which part of the physical storage capacity is used to store redundant information about user data stored on the remainder of the storage capacity. The redundant information enables regeneration of user data in the event that one of the array's member disks or the access path to it fails. SNIA.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

RAID 6

An extension of the RAID 5 array, that allows for two simultaneous drive failures without downtime or data loss. recovery point objective (RPO).

After a recovery operation, the recovery point objective (RPO) is the maximum desired time period, prior to a disaster, in which changes to data may be lost. This measure determines up to what point in time data should be recovered. Data changes preceding the disaster are preserved by recovery.

S

SAN

Storage Area Network, a network of shared storage devices that contain disks for storing data.

SAS

Serial Attached SCSI, an evolution of parallel SCSI into a point-to-point serial peripheral interface in which controllers are linked directly to disk drives. SAS delivers improved performance over traditional SCSI because SAS enables up to 128 devices of different sizes and types to be connected simultaneously.

SCSI

Small Computer System Interface, a parallel interface standard that provides faster data transmission rates than standard serial and parallel ports.

Session

A series of communications or exchanges of data between two end points that occurs during the span of a single connection. The session begins when the connection is established at both ends, and terminates when the connection is ended. For some applications each session is related to a particular port. In this document a session is the exchange of data between groups of primary and secondary volumes.

secondary volume (S-VOL)

A replica of the primary volume (P-VOL) at the time of a backup and is kept on a standby storage system. Recurring differential data updates are performed to keep the data in the S-VOL consistent with data in the P-VOL.

SMTP

Simple Mail Transfer Protocol, a protocol used to receive and store email data directly from email servers.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Software initiator

A software application initiator communicates with a target device. A software initiator does not require specialized hardware because all processing is done in software, using standard network adapters.

Storage Navigator Modular 2

A multi-featured scalable storage management application that is used to configure and manage the storage functions of Hitachi arrays. Also referred to as Navigator 2.

Subnet

In computer networks, a subnet or subnetwork is a range of logical addresses within the address space that is assigned to an organization. Subnetting is a hierarchical partitioning of the network address space of an organization (and of the network nodes of an autonomous system) into several subnets. Routers constitute borders between subnets. Communication to and from a subnet is mediated by one specific port of one specific router, at least momentarily. SNIA.

Switch

A network infrastructure component to which multiple nodes attach. Unlike hubs, switches typically have internal bandwidth that is a multiple of link bandwidth, and the ability to rapidly switch node connections from one to another. A typical switch can accommodate several simultaneous full link bandwidth transmissions between different pairs of nodes. SNIA.

T

Target

Devices that receive iSCSI requests that originate from an iSCSI initiator.

TCP Offload Engine (TOE)

A dedicated chip or adapter that handles much of the TCP/IP processing directly in hardware. TCP/IP transmission is inherently a CPU-intensive operation. Therefore, using dedicated hardware that can operate in parallel with the main processor allows for superior system performance. Although all iSCSI HBAs have a TOE, a generic TOE only implements TCP/IP, while an iSCSI HBA implements the iSCSI protocol in addition to TCP/IP.

U

User Datagram Protocol (UDP)

UDP is one of the core protocols of the Internet protocol suite. Using UDP, programs on networked computers can send short messages

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

sometimes known as datagrams (using Datagram Sockets) to one another.

UDP does not guarantee reliability or ordering in the way that TCP does. Datagrams may arrive out of order, appear duplicated, or go missing without notice. Avoiding the overhead of checking whether every packet actually arrived makes UDP faster and more efficient, at least for applications that do not need guaranteed delivery. Time-sensitive applications often use UDP because dropped packets are preferable to delayed packets. UDP's stateless nature is also useful for servers that answer small queries from huge numbers of clients. Unlike TCP, UDP is compatible with packet broadcast (sending to all on local network) and multicasting (send to all subscribers).

W

World Wide Name (WWN)

A unique identifier for an open systems host. It consists of a 64-bit physical address (the IEEE 48-bit format with a 12-bit extension and a 4-bit prefix). The WWN is essential for defining the SANtinel™ parameters because it determines whether the open systems host is to be allowed or denied access to a specified logical unit or a group of logical units.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Index

A

- Account Authentication
 - disabling (CLI) [A-4](#)
 - enabling (CLI) [A-4](#)
 - uninstalling (CLI) [A-4](#)
- Account Information
 - adding (CLI) [A-6](#)
- account information file [3-267](#)
- adding
 - a Host Group (CLI) [A-74](#)
 - a target (CLI) [A-82](#)
 - CHAP user (CLI) [A-86](#)
- Administration Mode [1-2](#)
- Administrative Mode
 - setting a password [3-270](#)
- array status
 - displaying [3-31](#)
- assignable WWN
 - selecting and adding (CLI) [A-77](#)
- aucache [3-35](#)
- aucrlan command [3-46](#)
- Audit Log
 - disabling (CLI) [A-17](#)
 - enabling (CLI) [A-17](#)
 - installing (CLI) [A-16](#)
 - uninstalling (CLI) [A-17](#)
- audrive command [3-33](#)
- auformat command [3-66](#)
- auformatst command [3-68](#)
- auinfomsg [3-47](#)
- auluadd command [3-62](#)
- auluref command [3-60](#)
- auparts command [3-38](#)
- aupartsopt command [3-44](#)
- aureplicationremote -create [3-340](#)
- aurev command [3-32](#)
- aurgadd command [3-54](#)
- aurgdel command [3-58](#)
- aurgexp command [3-56](#)

- aurgref command [3-52](#)
- automatic registering [3-19](#), [3-24](#)
- autruecopyopt -refer [3-355](#)
- autruecopyopt -set [3-355](#)
- auunitadd command [3-25](#)
- auunitaddauto command [3-24](#)
- auunitchg command [3-28](#)
- auunitdel command [3-29](#)
- auunitid command [3-48](#)
- auunitinfo [3-49](#)
- auunitref command [3-23](#)

B

- boot option [3-107](#)

C

- cache
 - configuration [3-35](#)
- cache configuration
 - displaying [3-35](#)
- Cache Residency Manager
 - enabling/disabling
 - CLI [A-64](#)
 - installing
 - CLI [A-63](#)
 - uninstalling
 - CLI [A-64](#)
- changing
 - CHAP user (CLI) [A-87](#)
 - host group name (CLI) [A-77](#)
 - initiator (CLI) [A-85](#)
 - target information (CLI) [A-84](#)
 - WWN nick name (CLI) [A-79](#)
- changing registration information [3-28](#)
- CHAP user [3-142](#)
 - adding (CLI) [A-86](#)
 - changing (CLI) [A-87](#)
 - deleting (CLI) [A-87](#)
- CLI [A-3](#)
 - adding

- Account Information [A-6](#)
- adding DP pool capacity [6-13](#)
- canceling DP optimization [6-19](#)
- changing DP pool thresholds [6-10](#)
- changing DP-VOL capacity [6-15](#)
- checking the progress of DP optimization [6-19](#)
- creating a DP-VOL [6-14](#)
- Creating a new DP pool [6-9](#)
- deleting a DP pool [6-11](#)
- deleting a DP-VOL from a DP pool [6-14](#)
- disabling [A-4](#), [A-17](#), [A-98](#)
- enabling [A-4](#), [A-17](#)
- enabling or disabling Dynamic Provisioning [6-7](#)
- installing [A-16](#), [A-88](#), [A-97](#)
- installing Dynamic Provisioning [6-2](#)
- managing DP pool information [6-16](#)
- managing DP pools [6-9](#)
- managing DP-VOLS [6-14](#)
- optimizing DP [6-18](#)
- optimizing the DP pool [6-18](#)
- recovering a DP pool [6-12](#)
- saving DP pool trend information to a file [6-17](#)
- uninstalling [A-4](#), [A-17](#), [A-98](#)
- viewing DP pool trend information [6-16](#)
- CLI commands vs CCI's for local repl [3-323](#), [4-27](#)
- CLI commands vs CCI's for remote repl [3-356](#), [5-31](#)
- CLI operations [6-1](#)
- Commands
 - aupool [3-305](#), [4-8](#)
 - aureplicationlocal -availablelist [3-302](#), [4-4](#)
 - aureplicationlocal -chg [3-315](#), [4-21](#)
 - aureplicationlocal -create [3-306](#), [4-9](#)
 - aureplicationlocal -refer [3-299](#), [4-2](#)
 - aureplicationlocal -restore [3-312](#), [4-17](#)
 - aureplicationlocal -resync [3-311](#), [4-15](#)
 - aureplicationlocal -simplex [3-314](#), [4-19](#)
 - aureplicationlocal -split [3-309](#), [4-12](#)
 - aureplicationmon -evwait [3-317](#), [4-23](#)
 - aureplicationmon -syncwait [3-352](#), [5-29](#)
 - aureplicationremote -availablelist [3-327](#), [5-5](#)
 - aureplicationremote -chg [3-350](#), [5-27](#)
 - aureplicationremote -create [3-341](#), [5-16](#)
 - aureplicationremote -refer [3-324](#), [5-2](#)
 - aureplicationremote -resync [3-345](#), [5-21](#)
 - aureplicationremote -simplex [3-348](#), [5-25](#)
 - aureplicationremote -split [3-343](#), [5-19](#)
 - aureplicationremote -swap [3-347](#), [5-23](#)
 - aureplicationvvol [3-303](#), [4-6](#)
 - aurmtpath -delete [3-336](#), [5-13](#)
 - aurmtpath -reconst [3-335](#), [5-12](#)
 - aurmtpath -refer [3-328](#), [5-6](#)
 - aurmtpath -set [3-331](#), [5-8](#)
 - aurmtpath -target [3-334](#), [5-10](#)
 - autruecopyopt -refer [3-338](#), [5-14](#)
- commands
 - administration [3-19](#)
 - device [3-131](#)
 - displaying syntax [3-19](#)
 - format [3-18](#)
 - help [3-20](#)
 - list [3-3](#)
 - list by device type [3-10](#)
 - overview [3-2](#)
 - registering an array [3-22](#)
 - specifications [3-16](#)
 - standard [3-18](#)
- commands to display array status
 - aucache [3-35](#)
 - aucrlan [3-46](#)
 - audrive [3-33](#)
 - auparts [3-38](#)
 - aurev [3-32](#)
 - ausupply [3-36](#)
 - auunitid [3-48](#)
 - auunitinfo [3-49](#)
- common parameters [3-160](#)
- component parts
 - displaying status [3-38](#)
- component status
 - battery [3-36](#)
 - displaying [3-36](#)
 - ENC [3-36](#)
 - fan [3-36](#)
 - loop [3-36](#)
 - power supply [3-36](#)
- conditions
 - for disabling Volume Migration [A-89](#)
 - for uninstalling Volume Migration [A-89](#)
- configuration file output and setting by file, commands
 - auconstitute [3-178](#), [3-182](#)
 - ausyspout [3-158](#)
- configuration file setting by file, commands
 - auconfigset [3-176](#)
 - ausyspset [3-174](#)
- configuration setup, commands
 - auadditionalunit [3-152](#)
 - auchapuser [3-142](#)
 - aucmddev [3-131](#)
 - audmlu [3-138](#)
 - auemailalert [3-148](#)
 - aufibre1 [3-120](#)
 - auhicopy [3-136](#)
 - auhostresp [3-156](#)
 - auiscsi [3-139](#)
 - auisns [3-141](#)
 - aulanport [3-152](#)
 - aulocateled [3-150](#)
 - aulupre [3-135](#)
 - auonlineverify [3-129](#)
 - auopt [3-124](#)
 - aureboot [3-133](#)

- ausnmp [3-147](#)
- auspare [3-122](#)
- ausslopt [3-155](#)
- auups [3-155](#)
- configuration, commands
 - auping [3-145](#)
- controller
 - parameters [3-163](#)
- controller ID
 - referencing [3-48](#)
- current IP address
 - displaying [3-46](#)
- Cycle Over Report [3-338, 5-14](#)
- cycle time [3-338, 5-14](#)

D

- deleting
 - CHAP user (CLI) [A-87](#)
 - detected WWN (CLI) [A-80](#)
 - host group (CLI) [A-78](#)
 - initiator (CLI) [A-86](#)
 - target (CLI) [A-85](#)
 - WWN (CLI) [A-79](#)
- deleting registration information [3-29](#)
- Deleting the RAID group [3-58](#)
- detected WWN
 - deleting (CLI) [A-80](#)
- disabling (CLI) [A-4, A-17, A-98](#)
- displaying
 - array status [3-31](#)
 - command syntax [3-19](#)
 - registration information [3-23](#)
- displaying cache configuration [3-35](#)
- displaying command syntax [3-19](#)
- displaying current IP address [3-46](#)
- displaying drive configuration [3-32, 3-33](#)
- displaying equipment information [3-49](#)
- displaying firmware revision [3-32](#)
- displaying logical unit formatting progress [3-68](#)
- displaying status of components [3-36](#)
- displaying the information messages [3-47](#)
- displaying the status of component parts [3-38](#)
- DM-LU [3-138](#)
- drive
 - configuration [3-33](#)
- drive configuration
 - displaying [3-33](#)

E

- enabling (CLI) [A-4, A-17, A-98](#)
- enabling/disabling LUN Manager (CLI) [A-73](#)
- equipment ID
 - referencing [3-48](#)
- equipment information [3-49](#)
 - displaying [3-49](#)
- errors, monitoring [3-249, 3-254](#)
- expanding a RAID group [3-56](#)

F

- fee-based option [3-124](#)
- fibre channel [3-120](#)
- Fibre Channel Option
 - disabling (CLI) [A-98](#)
 - installing (CLI) [A-97](#)
 - uninstalling (CLI) [A-98](#)
- Fibre Channel Option r
 - enabling (CLI) [A-98](#)
- firmware
 - revision [3-32](#)
 - updating [3-295](#)
- firmware revision
 - displaying [3-32](#)
- formatting a logical unit [3-66](#)

G

- GUI
 - enabling [A-98](#)
 - setting
 - Syslog Server Information [A-18](#)

H

- HDU, spare [3-122](#)
- help
 - commands [3-20](#)
 - option, command [3-19](#)
- Hi-Copy information [3-136](#)
- Host Group
 - adding (CLI) [A-74](#)
- host group
 - deleting (CLI) [A-78](#)
- host group 0
 - initializing (CLI) [A-78](#)
- host group name
 - changing (CLI) [A-77](#)
- Host Group Option
 - setting (CLI) [A-75](#)
- Host Group security
 - setting (CLI) [A-74](#)
- host storage domain, commands
 - auhgdef [3-208](#)
 - auhgmap [3-206](#)
 - auhgopt [3-191](#)
 - auhgout [3-210](#)
 - auhgset [3-212](#)
 - auhgwnn [3-186](#)

I

- information messages [3-47](#)
 - displaying [3-47](#)
- initializing
 - host group 0 (CLI) [A-78](#)
 - target 000 (CLI) [A-85](#)
- initiator
 - changing (CLI) [A-85](#)
 - deleting (CLI) [A-86](#)

- initiator information [3-218](#)
- installing [2-7](#)
 - LUN Manager (CLI) [A-72](#)
 - Navigator 2 [2-7](#)
- installing (CLI) [A-16](#), [A-88](#), [A-97](#)
- installing Cache Residency Manager
 - CLI [A-63](#)
- IP address [3-46](#)
- IPv6
 - supported platforms [2-6](#)
- iSCSI
 - port [3-139](#)
 - target information [3-215](#)
 - target mapping [3-233](#)
 - target options [3-221](#)
- iSNS
 - information [3-141](#)

L

- LAN
 - referencing and setting [3-102](#)
 - setting information online [3-114](#)
- logical unit
 - definition [1-2](#)
 - formatting [3-66](#)
 - formatting progress [3-68](#)
 - referencing [3-60](#)
 - setting [3-62](#)
- LU [A-89](#)
 - cache partition [3-84](#)
 - change size [3-86](#)
 - default controller [3-74](#)
 - deleting [3-71](#)
 - expanding [3-71](#)
 - formatting [3-66](#)
 - invalidating [3-78](#)
 - pre-fetch information [3-135](#)
 - progress of formatting [3-68](#)
 - reassigning [3-79](#)
 - referencing [3-60](#)
 - referencing unified LU [3-75](#)
 - restoring [3-80](#)
 - separating LUs [3-76](#)
 - setting up [3-62](#)
 - unifying LUs [3-76](#)
- LUN
 - definition [1-2](#)
- LUN Expansion
 - definition [1-2](#)
- LUN Manager
 - enabling/disabling (CLI) [A-73](#)
 - installing (CLI) [A-72](#)
 - uninstalling (CLI) [A-73](#)

M

- maintenance port [3-110](#)
- managing DP pools from the command line [6-9](#)
- managing DP-VOLs from the command line [6-14](#)
- mapping

- guard [3-82](#)
- messages, information [3-47](#)
- modes
 - Administration Mode [1-2](#)
 - Management Mode [1-2](#)
- Modular Volume Migration
 - installing (CLI) [A-88](#)
- monitoring errors, commands
 - auerralertopt [3-254](#)
 - auerroralert [3-249](#)
 - auextprog [3-248](#)

N

- NAS
 - system LU [3-239](#)
 - user LU [3-242](#)
- Navigator 2
 - about [1-2](#)
 - features [1-2](#), [1-4](#)
 - functions [1-5](#)
 - modes [1-2](#)
 - program products [1-4](#)
 - software applications [1-4](#)
- NNC
 - LAN [3-237](#)
 - parameters [3-236](#)
 - status [3-244](#)
- NNC parameters, commands
 - aunassyslu [3-239](#)
 - aunasuserlu [3-242](#)
 - aunnc [3-244](#)
 - aunncan [3-237](#)

O

- obtaining performance information, commands
 - auperform [3-272](#)
 - aupfmstatiscfg [3-293](#)

P

- parameters
 - lu ownership tuning [3-266](#)
 - LU tuning [3-261](#)
 - multi-stream tuning [3-264](#)
 - NNC [3-236](#)
 - prefetch tuning [3-262](#)
 - system [3-89](#)
 - tuning [3-258](#)
- parity correction online [3-81](#)
- parts options
 - referencing [3-44](#)
- password
 - setting in Administration Mode [3-270](#)
- performance file [3-272](#)
- performance statistics [3-293](#)
- ping, sending [3-145](#)
- port
 - option [3-104](#)
 - setting TCP/IP [3-21](#)

Index-4

provisioning attributes [6-20](#)

Q

quick format option [3-69](#)

R

RAID Group

- definition [1-2](#)
- referencing [3-52](#)
- setting up [3-54](#)

RAID group

- deleting [3-58](#)
- expanding [3-56](#)
- referencing [3-52](#)

RAID/LU

- setting information [3-176](#)

RAID/LU, commands

- amapguard [3-82](#)
- auformat [3-66](#)
- auformatst [3-68](#)
- auluadd [3-62](#)
- aulucachept [3-84](#)
- auluchg [3-74](#)
- auluchgsize [3-86](#)
- aulucorrect [3-81](#)
- auludel [3-71](#)
- auluexp [3-71](#)
- auluinvalidate [3-78](#)
- aulumrg [3-76](#)
- aulureallocate [3-79](#)
- auluref [3-60](#)
- aulurestoration [3-80](#)
- aumludiv [3-76](#)
- aumluref [3-75](#)
- auquickfmopt [3-69](#)
- aurgref [3-52](#)

rebooting arrays [3-133](#)

referencing controller ID [3-48](#)

referencing equipment ID [3-48](#)

referencing logical unit [3-60](#)

referencing parts options [3-44](#)

referencing RAID Group [3-52](#)

registering an array [3-22](#)

registration

- automatic [3-24](#)
- changing [3-28](#)
- deleting [3-29](#)
- displaying [3-23](#)
- manual [3-25](#)

registration information

- changing [3-28](#)
- deleting [3-29](#)

RTC [3-100](#)

S

selecting and adding assignable WWN (CLI) [A-77](#)

setting

Host Group Option (CLI) [A-75](#)

Host Group security (CLI) [A-74](#)

logical unit (CLI) [A-83](#)

setting up a logical unit [3-62](#)

setting up RAID Group [3-54](#)

snmp environment [3-147](#)

statistical information [3-271](#)

syntax, command [3-19](#)

Syslog Server Information

setting (CLI) [A-18](#)

system

- parameters [3-95](#), [3-174](#)
- parameters online [3-92](#)

system parameter, commands

- aubootopt [3-107](#)
- aulan [3-102](#)
- aumaintelan [3-110](#)
- auonlan [3-114](#)
- auonsysprm [3-92](#)
- auportop [3-104](#)
- aurtc [3-100](#)
- ausysparam [3-95](#)
- ausystemparam [3-89](#)
- autimezone [3-109](#)

system requirements [2-2](#)

AIX [2-4](#)

HP-UX [2-4](#)

IRIX [2-5](#)

Linux [2-5](#)

Solaris [2-4](#)

Solaris (x86, 32 bits OS) [2-4](#)

Windows [2-2](#)

T

target

- adding (CLI) [A-82](#)
- deleting (CLI) [A-85](#)
- iSCSI [3-215](#)

target 000

- initializing (CLI) [A-85](#)

target information

- changing (CLI) [A-84](#)

target information, commands

- autargetdef [3-215](#)
- autargetini [3-218](#)
- autargetmap [3-233](#)
- autargetopt [3-221](#)

TCP/IP port number [3-21](#)

setting [3-20](#)

time zone [3-109](#)

tuning parameters, commands

- aulutuning [3-261](#)
- ausystuning [3-258](#)
- autuningluown [3-266](#)
- autuningmultistream [3-264](#)
- autuningprefetch [3-262](#)

U

uninstalling [2-13](#)

- LUN Manager (CLI) [A-73](#)
- uninstalling (CLI) [A-4](#), [A-17](#), [A-98](#)
- uninstalling Cache Residency Manager
CLI [A-64](#)
- uninstalling optional features [A-64](#)
- updating [2-11](#)
 - Navigator 2 [2-11](#)

V

Volume Migration See Modular Volume Migration

W

WWN

- deleting (CLI) [A-79](#)

WWN nick name

- changing (CLI) [A-79](#)

Hitachi Data Systems

Corporate Headquarters

2845 Lafayette Street
Santa Clara, California 95050-2639
U.S.A.
www.hds.com

Regional Contact Information

Americas

+1 408 970 1000
info@hds.com

Europe, Middle East, and Africa

+44 (0)1753 618000
info.emea@hds.com

Asia Pacific

+852 3189 7900



MK-91DF8276-22