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Hitachi Storage Navigator Modular 2 Command Line Interface (CLI) Unified Reference Guide

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Hitachi Data Systems

MK-97DF8089-38

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Export authorization is required for the AMS 2000 Data At Rest Encryption

- Import/Use regulations may restrict export of the AMS2000 SED to certain countries
- China – AMS2000 is eligible for import but the License Key and SED may not be sent to China
- 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

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A Appendix A A-1

Glossary

Index

Preface

This document describes and provides instructions for using the Hitachi Storage Navigator Modular 2 (SNM2) command line interface (CLI) 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 topics:

- Intended audience
- Product version
- Release notes and readme
- Document revision level
- Changes in this revision
- Document conventions
- Convention for storage capacity values
- Accessing product documentation
- Getting help

Intended audience

This document is intended for system administrators, Hitachi Data Systems representatives, and Authorized Service Providers who install, configure, and operate Hitachi Adaptable Modular System (AMS) 2000 family storage systems.

Product version

This document applies to AMS firmware version 08D3/A or later and to Navigator 2 CLI version 13.30 or later.

Release notes and readme

Read the release notes and readme file before installing and using this product. They may contain requirements or restrictions that are not fully described in this document or updates or corrections to this document.

Changes in this revision

- Under Referencing/setting system parameters (page 3-83), added Host I/O Restraint State Report Mode command to AMS2000 commands.

Chapter/Appendix Title	Description
Chapter 1, Introduction	Describes the general features, functions, and benefits of using Hitachi CLI.
Chapter 2, Installing the CLI	Describes the process of installing Navigator 2 so the CLI is active.
Chapter 3, Command List	Describes each command in the full Navigator 2 command set.
Appendix A, Appendix A — CLI-based storage feature tasks	Describes CLI-based storage feature tasks.

Document conventions

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.
	Caution	Cautions indicate that failure to take a specified action could result in damage to the software or hardware.

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**.
Italic	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: copy *source-file target-file* Angled brackets (< >) are also used to indicate variables.
screen/code	Indicates text that is displayed on screen or entered by the user. Example: `# pairdisplay -g oradb`
< > angled brackets	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: `# pairdisplay -g <group>` 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: [a | b]

Convention for storage capacity values

Physical storage capacity values (e.g., disk drive capacity) are calculated based on the following values:

Physical capaciy 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
1 EB	1,000 PB or $1,000^6$ bytes

Logical storage capacity values (e.g., logical device capacity) are calculated based on the following values:

Logical capaciy 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 AMS 2000 Family user documentation is available on the Hitachi Data Systems 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.

This documentation set consists of the following documents.

Release notes

- Adaptable Modular Storage System Release Notes
- Storage Navigator Modular 2 Release Notes



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

Installation and getting started

The following documents provide instructions for installing an AMS 2000 Family storage system. They include rack information, safety information, site-preparation instructions, getting-started guides for experienced users, and host connectivity information. The symbol ?identifies documents that contain initial configuration information about Hitachi AMS 2000 Family storage systems.

☞ **AMS2100/2300 Getting Started Guide**, MK-98DF8152

Provides quick-start instructions for getting an AMS 2100 or AMS 2300 storage system up and running as quickly as possible.

☞ **AMS2500 Getting Started Guide**, MK-97DF8032

Provides quick-start instructions for getting an AMS 2500 storage system up and running as quickly as possible.

AMS 2000 Family Site Preparation Guide, MK-98DF8149

Contains initial site planning and pre-installation information for AMS 2000 Family storage systems, expansion units, and high-density expansion units. This document also covers safety precautions, rack information, and product specifications.

AMS 2000 Family Fibre Channel Host Installation Guide, MK-08DF8189

Describes how to prepare Hitachi AMS 2000 Family Fibre Channel storage systems for use with host servers running supported operating systems.

AMS 2000 Family iSCSI Host Installation Guide, MK-08DF8188

Describes how to prepare Hitachi AMS 2000 Family iSCSI storage systems for use with host servers running supported operating systems.

Storage and replication features

The following documents describe how to use Storage Navigator Modular 2 (Navigator 2) to perform storage and replication activities.

Storage Navigator 2 Advanced Settings User's Guide, MK-97DF8039

Contains advanced information about launching and using Navigator 2 in various operating systems, IP addresses and port numbers, server certificates and private keys, boot and restore options, outputting configuration information to a file, and collecting diagnostic information.

Storage Navigator Modular 2 User's Guide, MK-99DF8208

Describes how to use Navigator 2 to configure and manage storage on an AMS 2000 Family storage system.

AMS 2000 Family Dynamic Provisioning Configuration Guide, MK-09DF8201

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

Storage Navigator 2 Storage Features Reference Guide for AMS, MK-97DF8148

Contains concepts, preparation, and specifications for Account Authentication, Audit Logging, Cache Partition Manager, Cache Residency Manager, Data Retention Utility, LUN Manager, Performance Monitor, SNMP Agent, and Modular Volume Migration.

AMS 2000 Family Copy-on-write SnapShot User Guide, MK-97DF8124

Describes how to create point-in-time copies of data volumes in AMS 2100, AMS 2300, and AMS 2500 storage systems, without impacting host service and performance levels. Snapshot copies are fully read/write compatible with other hosts and can be used for rapid data restores, application testing and development, data mining and warehousing, and nondisruptive backup and maintenance procedures.

AMS 2000 Family ShadowImage In-system Replication User Guide, MK-97DF8129

Describes how to perform high-speed nondisruptive local mirroring to create a copy of mission-critical data in AMS 2100, AMS 2300, and AMS 2500 storage systems. ShadowImage keeps data RAID-protected and fully recoverable, without affecting service or performance levels. Replicated data volumes can be split from host applications and used for system backups, application testing, and data mining applications while business continues to operate at full capacity.

AMS 2000 Family TrueCopy Remote Replication User Guide, MK-97DF8052

Describes how to create and maintain multiple duplicate copies of user data across multiple AMS 2000 Family storage systems to enhance your disaster recovery strategy.

AMS 2000 Family TrueCopy Extended Distance User Guide, MK-97DF8054

Describes how to perform bi-directional remote data protection that copies data over any distance without interrupting applications, and provides failover and recovery capabilities.

AMS 2000 Data Retention Utility User's Guide, MK-97DF8019

Describes how to lock disk volumes as read-only for a certain period of time to ensure authorized-only access and facilitate immutable, tamper-proof record retention for storage-compliant environments. After data is written, it can be retrieved and read only by authorized applications or users, and cannot be changed or deleted during the specified retention period.

Storage Navigator Modular 2 online help

Provides topic and context-sensitive help information accessed through the Navigator 2 software.

Hardware maintenance and operation

The following documents describe how to operate, maintain, and administer an AMS 2000 Family storage system. They also provide a wide range of technical information and specifications for the AMS 2000 Family storage systems. The symbol ?identifies documents that contain initial configuration information about Hitachi AMS 2000 Family storage systems.

- **AMS 2100/2300 Storage System Hardware Guide**, MK-97DF8010

  Provides detailed information about installing, configuring, and maintaining AMS 2100 and 2300 storage systems.

- **AMS 2500 Storage System Hardware Guide**, MK-97DF8007

  Provides detailed information about installing, configuring, and maintaining an AMS 2500 storage system.

- **AMS 2000 Family Storage System Reference Guide**, MK-97DF8008

  Contains specifications and technical information about power cables, system parameters, interfaces, logical blocks, RAID levels and configurations, and regulatory information about AMS 2100, AMS 2300, and AMS 2500 storage systems. This document also contains remote adapter specifications and regulatory information.

AMS 2000 Family Storage System Service and Upgrade Guide, MK-97DF8009

Provides information about servicing and upgrading AMS 2100, AMS 2300, and AMS 2500 storage systems.

AMS 2000 Family Power Savings User Guide, MK-97DF8045

Describes how to spin down volumes in selected RAID groups when they are not being accessed by business applications to decrease energy consumption and significantly reduce the cost of storing and delivering information.

Command and Control (CCI)

The following documents describe how to install the Hitachi AMS 2000 Family Command Control Interface (CCI) and use it to perform TrueCopy and ShadowImage operations.

AMS 2000 Family Command Control Interface (CCI) Installation Guide, MK-97DF8122

Describes how to install CCI software on open-system hosts.

AMS 2000 Family Command Control Interface (CCI) Reference Guide, MK-97DF8121

Contains reference, troubleshooting, and maintenance information related to CCI operations on AMS 2100, AMS 2300, and AMS 2500 storage systems.

AMS 2000 Family Command Control Interface (CCI) User's Guide, MK-97DF8123

Describes how to use CCI to perform TrueCopy and ShadowImage operations on AMS 2100, AMS 2300, and AMS 2500 storage systems.

Command Line Interface (CLI)

The following documents describe how to use Hitachi Storage Navigator Modular 2 to perform management and replication activities from a command line.

Storage Navigator Modular 2 Command Line Interface (CLI) Unified Reference Guide, MK-97DF8089 — this document

Describes how to interact with all Navigator 2 bundled and optional software modules by typing commands at a command line.

Storage Navigator 2 Command Line Interface Replication Reference Guide for AMS, MK-97DF8153

Describes how to interact with Navigator 2 to perform replication activities by typing commands at a command line.

Dynamic Replicator documentation

The following documents describe how to install, configure, and use Hitachi Dynamic Replicator to provide AMS Family storage systems with continuous data protection, remote replication, and application failover in a single, easy-to-deploy and manage platform.

Dynamic Replicator - Scout Release Notes, RN-99DF8211

Dynamic Replicator - Scout Host Administration Guide, MK-98DF8212

Dynamic Replicator - Scout Installation and Configuration Guide, MK-98DF8213

Dynamic Replicator - Scout Quick Start Guide, MK-98DF8214

Dynamic Replicator - Scout Host Troubleshooting Guide, MK-98DF8215

Dynamic Replicator DR-Scout ICAT Utility Guide, MK-98DF8216

Dynamic Replicator - Scout RX Server Deployment Guide, MK-98DF8217

Dynamic Replicator VX Solution for Oracle (Solaris), MK-98DF8218

Dynamic Replicator - Scout Solution for SharePoint 2007, MK-98DF8219

Dynamic Replicator - Scout Solution for MySQL (Windows), MK-98DF8220

Protecting Citrix XenServer Using Hitachi Dynamic Replicator - Scout, MK-98DF8221

Dynamic Replicator Quick Install/Upgrade Guide, MK-98DF8222

Dynamic Replicator - Scout Protecting MS SQL Server, MK-98DF8223

Dynamic Replicator - Scout - Protecting Microsoft Exchange Server, MK-98DF8224

Dynamic Replicator - Scout File Server Solution, MK-98DF8225

Dynamic Replicator - Scout ESX - Protecting ESX Server (RCLI), MK-99DF8226

Getting help

If you need to contact the Hitachi Data Systems support center, please provide as much information about the problem as possible, including:

- The circumstances surrounding the error or failure.
- The exact content of any messages displayed on the host systems.
- The exact content of any messages displayed on Storage Navigator Modular 2.
- The Storage Navigator Modular 2 configuration information. This information is used by service personnel for troubleshooting purposes.

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 Hitachi Data Systems Portal for contact information: https://portal.hds.com

Comments

Please send us 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! (All comments become the property of Hitachi Data Systems.)

1

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
- Storage Navigator Modular 2 Features
- Storage Navigator Modular 2 Program Products

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. This operating mode is accessible only to users with administrator permissions.

Storage Navigator Modular 2 Features

The following table 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.
LUN Expansion	Unified logical units.
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:** *Modifying the differential management logical unit on the Simple Modular Storage system invalidates your Hitachi warranty and support.*
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. *Note that modifying the online verification information on the Simple Modular Storage system invalidates your Hitachi warranty and support.*
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.

Storage Navigator Modular 2 Program Products

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
LU definition	LU creation	Used to add a logical unit (LU). A new logical unit is added by specifying its capacity.	Yes	No
	LU deletion	Deletes the defined logical unit. User data is also deleted.	No	No
	LU formatting	Required to make a defined logical unit accessible by the host. Writes null data to the specified logical unit, and deletes user data.	No /Yes	No
	Parity correction	Restores the logical unit 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

2

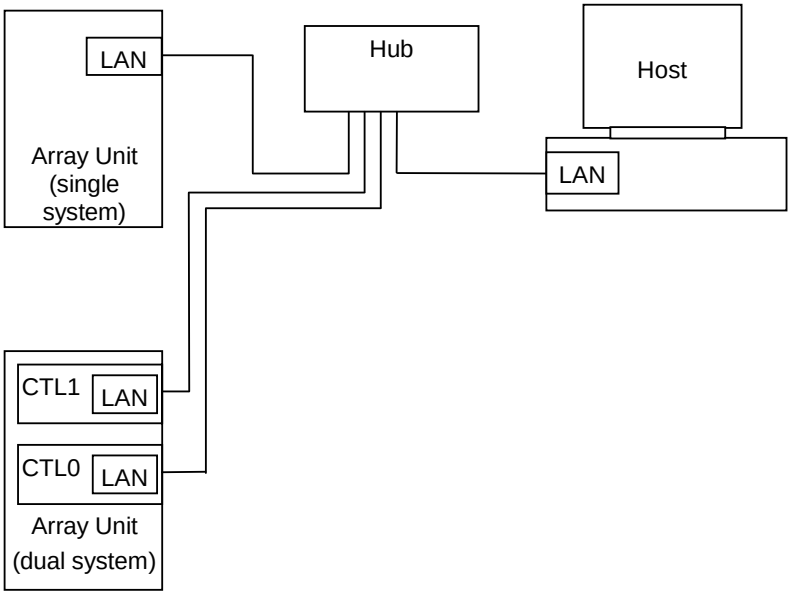
Installing the CLI

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

- Connecting Storage Navigator Modular 2 to the Host
- System Requirements
- IPv6 Supported Platforms
- Installing Storage Navigator Modular 2
- Updating Storage Navigator Modular 2

Connecting Storage Navigator Modular 2 to the Host

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



System Requirements

This section describes system requirements for your environment.

Windows

Windows® XP (with SP2 or SP3), Windows Server™ 2003 (with SP1 or SP2), Windows Server™ 2003 (R2) (with or without SP2), Windows Server™ 2003 R2 (x64) (with or without SP2), Windows® Vista (with SP1 or SP2), or Windows Server™ 2008 (x86, x64). The 64-bit Windows is not supported except Windows Server™ 2003 R2 (x64), Windows Server™ 2008 (x64), or Windows 7 (X86, X64) (with or without SP1). Intel® Itanium® is not supported; Windows Server 2008 R2 (x64) (without SP, SP1), Windows Server 2012 (x64) (without SP).

CPU: Pentium®

Memory: 256 MB minimum

Disk capacity: 50 MB minimum

Network adapter

Virtual environment:

Host Operating System	Guest Operating System
VMware ESX Server 3.x	Windows XP
VMWare 4.1	Windows Server 2008 SP2 (x64) Windows Server 2008 R2 (x64)

Host Operating System	Guest Operating System
VMware 5.0	Windows Server 2008 R2 (SP1) (x64)
Windows Server 2008 R2 (x64) (Hyper-V2)	Windows Server 2008 R2 (x64)

Operating environments of guest OS is same as normal operating environments.

The following specifications show the operating environments of Hitachi Storage Navigator Modular 2.

Browser: IE6.0 (SP1, SP2, SP3), IE7.0, IE8.0 or IE9.0

The 64-bit IE is not supported. However, the 64-bit IE6.0 (SP1, SP2, SP3) on Windows Server 2003 R2 (x64) and the 64-bit IE7.0 on Windows Server 2008 (x64) is supported.

IE8.0 (x86, x64) and IE9.0 (x86, x64) are supported on Windows 7 and Windows Server 2008 R2.

IE 8.0 is supported on Windows XP (SP3).

JRE: JRE 1.6.0_45, JRE 1.6.0_43, JRE 1.6.0_41, JRE 1.6.0_37, JRE 1.6.0_33, JRE 1.6.0_31, JRE 1.6.0_30, JRE 1.6.0_25, JRE 1.6.0_22, JRE 1.6.0_20, JRE 1.6.0_15, JRE 1.6.0_13, JRE 1.6.0_10

The JRE download from http://java.com/en/download/, and then install JRE.

For more installation about JRE, refer to java download page.

When you operate AMS2000 and SMS, installation of JRE is not necessary.

When you operate 9500V and AMS/WMS, install JRE.

CPU: (1 GHz or more is recommended)

Physical memory: 1 GB or more (2 GB or more is recommended)

When using Hitachi Storage Navigator Modular 2 and other software products together, the memory capacity totaling the value of each software product is required.

Available disk capacity: A free capacity of 100 MB or more is required.

Monitor: Resolution 800 ? 600, 1,024 ? 768 or more is recommended, 256 color or more.

Solaris™ (SPARC)

Hitachi Storage Navigator Modular 2 works only in global zone (normal global environment). Even if non-global zone is created, install Hitachi Storage Navigator Modular 2 in global zone. For Solaris 10, do not perform the zone setting of the system during the installation. If it is performed, the installation may fail.

Host

OS: Solaris 8 (SPARC),

Solaris 9 (SPARC)

Solaris 10 (SPARC), or

Solaris 10 (x64)

CPU: SPARC minimum 1 GHz (2 GHz or more is recommended)

Solaris 10 (x64): Minimum 1.8 GHz (2 GHz or more is recommended)



NOTE: Not supported x86 processor as like Opteron.

Solaris 10 (x64) is supported 64 bits kernel mode on Sun Fire x64 server family only. Do not change the kernel mode to other than 64 bits after installing Hitachi Storage Navigator Modular 2.

Physical memory: 1 GB or more (2 GB or more is recommended)

When using Hitachi Storage Navigator Modular 2 and other software products together, the memory capacity totaling the value of each software product is required.

Available disk capacity: A free capacity of 1.5 GB or more is required.

JDK: JDK1.5.0 is required for Solaris 10 (x64) environment.

Client

OS: Solaris 8 (SPARC),

Solaris 9 (SPARC),

Solaris 10 (SPARC),

Solaris 10 (x86), or

Solaris 10 (x64)

CPU: SPARC minimum 1 GHz (2 GHz or more is recommended)

Solaris 10 (x64): Minimum 1.8 GHz (2 GHz or more is recommended)

Note: Not supported x86 processor as like Opteron.

Solaris 10 (x64) is supported 64 bits kernel mode on Sun Fire x64 server family only. Do not change the kernel mode to other than 64 bits after installing Hitachi Storage Navigator Modular 2.

Browser: Mozilla 1.7, Firefox 2

JRE: JRE 1.6.0_45, JRE 1.6.0_43, JRE 1.6.0_41, JRE 1.6.0_37, JRE 1.6.0_33, JRE 1.6.0_31, JRE 1.6.0_30, JRE 1.6.0_25, JRE 1.6.0_22, JRE 1.6.0_20, JRE 1.6.0_15, JRE 1.6.0_13, JRE 1.6.0_10

The JRE download from http://java.com/en/download/, and then install JRE.

For more installation about JRE, refer to the Java download page.

When you operate AMS2000 and SMS, installation of JRE is not necessary.

When you operate 9500V and AMS/WMS, install JRE.

CPU: (1 GHz or more is recommended)

Physical memory: 1 GB or more (2 GB or more is recommended)

When using Hitachi Storage Navigator Modular 2 and other software products together, the memory capacity totaling the value of each software product is required.

Available disk capacity: A free capacity of 100 MB or more is required.

Monitor: Resolution 800 x600, 1,024 x768 or more is recommended, 256 color or more.

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: 100 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: 80 MB minimum

Network adapter

Premise program: IBM XL C/C++ Enterprise Edition V8.0 for AIX, Runtime Environment and Utilities. Moreover, libc version must be following or more.

AIX 5.1: bos.rte.libc 5.1.0.62 (APARIY58419)

AIX 5.2: bos.rte.libc 5.2.0.41 (APARIY58421)

AIX 5.3: box.rte.libc 5.3.03 (APARIY58143)

Linux

Host

OS: Red Hat Enterprise Linux AS 4.0 (x86) update1 or
Red Hat Enterprise Linux AS 4.0 (x86) update5
Red Hat Enterprise Linux 5.3 (x86) (excluding SELinux)
Red Hat Enterprise Linux 5.4 (x86) (excluding SELinux)
Red Hat Enterprise Linux 5.4 (x64) (excluding SELinux)
Red Hat Enterprise Linux 5.5 (x86) (excluding SELinux)
Red Hat Enterprise Linux 5.5 (x64) (excluding SELinux)
Red Hat Enterprise Linux 5.6 (x86) (excluding SELinux)
Red Hat Enterprise Linux 5.6 (x64) (excluding SELinux)
Note: Not supported update from Red Hat Enterprise Linux AS 4.0 to update.
When using Hitachi Storage Navigator Modular 2 and other software products together, the memory capacity totaling the value of each software product is required.

CPU: Pentium-II, III, IV (1 GHz or more is recommended)

Memory: 1 GB or more (2 GB or more is recommended)

Disk capacity: Available disk capacity: A free capacity of 800 MB or more is required.

Client

OS: Red Hat Enterprise Linux AS 4.0 (x86) update1 or
Red Hat Enterprise Linux AS 4.0 (x86) update5
Red Hat Enterprise Linux 5.3 (x86) (excluding SELinux)
Red Hat Enterprise Linux 5.4 (x86) (excluding SELinux)
Red Hat Enterprise Linux 5.4 (x64) (excluding SELinux)
Red Hat Enterprise Linux 5.5 (x86) (excluding SELinux)
Red Hat Enterprise Linux 5.5 (x64) (excluding SELinux)
Red Hat Enterprise Linux 5.6 (x86) (excluding SELinux)
Red Hat Enterprise Linux 5.6 (x64) (excluding SELinux)
Note: Not supported update from Red Hat Enterprise Linux AS 4.0 to update.
Browser: Mozilla 1.7
JRE: JRE 1.6.0_45, JRE 1.6.0_43, JRE 1.6.0_41, JRE 1.6.0_37, JRE 1.6.0_33, JRE 1.6.0_31, JRE 1.6.0_30, JRE 1.6.0_25, JRE 1.6.0_22, JRE 1.6.0_20, JRE 1.6.0_15, JRE 1.6.0_13, JRE 1.6.0_10
The JRE download from http://java.com/en/download/, and then install JRE. For more installation about JRE, refer to java download page. The 64-bit JRE is not supported.
When you operate AMS2000 and SMS, installation of JRE is not necessary.
When you operate 9500V and AMS/WMS, install JRE.
When using Hitachi Storage Navigator Modular 2 and other software products together, the memory capacity totaling the value of each software product is required.
Available disk capacity:

CPU: Pentium-II, III, IV (1 GHz or more is recommended)

Memory: Disk capacity: A free capacity of 100 MB or more is required.

Monitor: Resolution 800 x 600, 1,024 x768 or more is recommended, 256 color or more.

IRIX

IRIX 6.5

CPU: R10000 or higher

Memory: 256 MB minimum

Disk capacity: 130 MB maximum

Network adapter

IPv6 Supported Platforms

Table 2-1 shows the IPv6 supported platforms.

Table 2-1: 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 7 (x86)	Without SP, With SP1	Supported
	Windows 7 (x64)	Without SP, With SP1	Supported
	Windows Server 2012 (x64)	Without SP	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 (Excluding SELinux)	-	Supported
	Red Hat Enterprise Linux 5.4 (Excluding SE Linux)	-	Supported
	Red Hat Enterprise Linux 5.5 (Excluding SE Linux)	-	Supported
	Red Hat Enterprise Linux 5.6	-	Supported
	Red Hat Enterprise Linux 5.7 (x86)	-	Supported
	Red Hat Enterprise Linux 5.7 (x64)	-	Supported
	Red Hat Enterprise Linux 5.7 (x86)	-	Supported

Table 2-1: IPv6 Supported Platforms

	Red Hat Enterprise Linux 5.7 (x64)	-	Supported
	Red Hat Enterprise Linux 6.1 (x86)	-	Supported
	Red Hat Enterprise Linux 6.1 (x64)	-	Supported
	Red Hat Enterprise Linux 6.2 (x86)	-	Supported
	Red Hat Enterprise Linux 6.2 (x64)	-	Supported

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 snm_win directory of the CD 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)

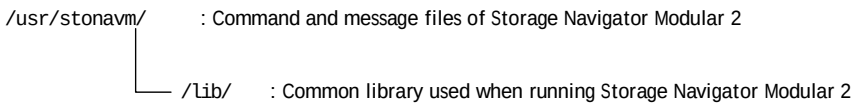
1. Start the SUN® server/workstation.
2. Create a new directory (e.g., /usr/stonavm).

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 directory in the CD, 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}
   ```

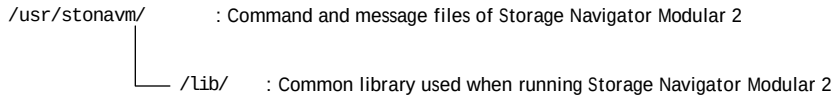
7. Define statements 5 and 6 in the initial setting file (for C shell: .login) of the login shell.
8. Log in again.

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 CD, 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.



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.

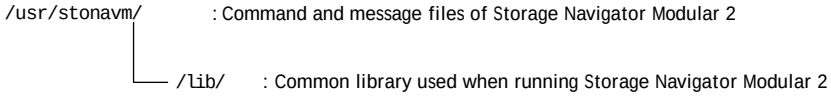
   Log in again.

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 CD, 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.



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}
```

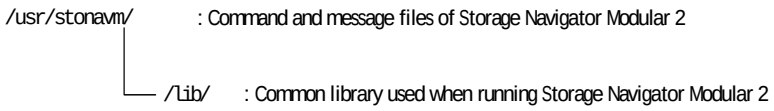
8. Define statements 5 and 6 in the initial setting file (for C shell: .login) of the login shell.
9. Log in again.

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 CD, 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 ModularStorage 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_irix directory in the CD, 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.

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

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 ModularStorage 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 ModularStorage Navigator Modular 2, close it and then restart it.

Windows

Run HSNM2-xxxx-W-CLI.exe in the snm_win directory of the CD that was provided.

Solaris (SPARC and x86 32 Bits OS)

1. Copy the HSNM2-xxxx-S-CLI.tar file from the snm_sol in the CD, 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 directory in the CD, 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 directory in the CD, 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 directory in the CD, 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 directory in the CD, 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 or Remove function in the Control Panel.
2. Delete the directory that was created in the hard disk when Storage Navigator ModularStorage Navigator Modular 2 was installed.

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.

Navigator 2 considerations

When using Navigator, consider the following:

- Some Navigator functions are not available while the array is online with a host.
- When a high I/O load exists, the functions that are available while online might cause a command time-out in the host or a recovering fault in Navigator 2. Hitachi recommends you execute these functions while offline.
- At least one logical unit must be configured in the array, to make all of Navigator 2 functions available. If a logical unit is not defined in the array, some functions cannot run.
- Navigator 2 can control up to 4,096 array units. You can only configure operations (setting of RAID groups, logical units, etc.) on one array unit at a time. Halt Error Alert monitoring to configure arrays.
- When the host enters the suspension state (low power mode) while Navigator 2 is running, Navigator might not operate correctly after the host is released from the suspension status.
- When you operate Navigator 2, disable power management through Windows so that the host will not enter the suspension state.

Conditions that cause Navigator 2 failures

Navigator may hang up in the following cases:

- The communication with the connected array fails due to controller blockage, array failure, disconnected LAN connection, or the array unit receives a Reset/LIP from the host.
- Other applications are working concurrently and memory utilization or CPU use rate is high.
- If Navigator 2 hangs up, manually terminate it and check the array status and the LAN connection status. Then, boot up Navigator 2 once again. Start Navigator 2 when you have finished other applications.
- When Navigator 2 connects to the array via a LAN, it uses the TCP/IP port number of 2000 by default.

Other Navigator 2 restrictions

The restrictions listed in the following table exist if Navigator 2 is used in combination with other programs, for one array:

Table 2-2: Restrictions for Multiple Programs used Concurrently for One Array

Program Name	Concurrent Use Supported	Concurrent Use Not Supported
Navigator 2	• SNMP Function • Disk Array built-in Web Server Function	• Hitachi Storage Navigator Modular 2 • Storage Navigator Modular for Web

Program Name	Concurrent Use Supported	Concurrent Use Not Supported
Navigator 2 for Web	• SNMP Function • Disk Array0built-in Web Server Function	• Navigator 2 • Navigator 2 for Web
SNMP Function	• Navigator 2 • Navigator 2 for Web • SNMP Function • Disk Array built-in Web Server Function	N/A
Disk Array-built-in Web Server Function	• Navigator 2 • Navigator 2 for Web • SNMP Function • Disk Array-built-in Web Server	N/A



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

- In addition, if you terminate one Navigator 2 instance while using two Navigator 2 products simultaneously, another Navigator 2 instance may terminate abnormally. If this occurs, launch the Navigator 2 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, start another program with that combination after terminating the running program.
- To operate other programs, refer to their respective user guides, which are provided with the program products.
- 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 behavior may occur, depending on the LAN environment. When Navigator 2 cannot connect to an 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 is not required. Operation of Navigator 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, execute it again after completing the firmware update or controller maintenance.

- If you detect an array failure, contact the Hitachi Customer Engineer.
- Do not use the reserved words prescribed for each OS and device names that indicate the input/output destinations as a file name when a file is output. Windows includes con, pm, aux, etc., and Unix includes /dev*, etc. For example, when con is specified as an output file name, an error message displays.
- When a command is executed through utilization of a network with telnet, etc., a window may be closed by pressing the Enter key, depending on the Alive Time value of the window. Set the Alive Time value to be more than 10 minutes.
- When operating the command for the array, which indicates that the Account Authentication function is valid, it terminates abnormally if it does not respond with the confirmation message within the session time-out (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 time-out, log in again and reissue the command.
- When connecting Navigator 2 using IPv6, if the temporary address of IPv6 is set to Enabled 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, make sure the Navigator 2 instance is installed on the same link as the one used for the local scope when you set up the array and the computer.
- If you halt a command execution by issuing a Ctrl - C key sequence and then execute the command again immediately, an error may occur. After halting the command by a Ctrl - C key sequence, wait a few minutes before executing the command again.
- While executing the setting/reference operation by Navigator 2, the performance of the storage system for the host I/O may deteriorate. Also, if you execute multiple settings/references by Navigator 2 at the same time, the storage system performance for the host I/O may deteriorate compared to the single execution. Hitachi recommends you perform the operations to the storage system at once during host I/O execution be less than five (less than two for 9500V).
- The setting/reference operations that one array can receive from Navigator 2 at once have the upper limits as shown in the following table.

Revisions of the array and firmware		The maximum number of operations that can be received
AMS 2000	08C5/A	50 operations
	Less than 08C5/A	5 operations

Revisions of the array and firmware		The maximum number of operations that can be received
SMS	All revisions	5 operations
AMS/WMS	All revisions	5 operations
9500V	All revisions	2 operations

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

Message Code	Error Code	The maximum number of operations that can be received
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.
DMEA00000B	0x00001002	Failed to transfer data. Confirm the subsystem status and the LAN environment, and then try again.

In environments where the process monitoring and the virus monitoring service (daemon process) are running, the 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 phenomena might be resolved by canceling the process monitoring and the virus monitoring service or excluding the Hitachi Storage Navigator Modular 2 installation directory from the monitoring target.

3

Command List

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

- Overview
- Notes at the Time of Functional Operation
- Command format and command types
- Commands for registering an array
- Setting a password in administration mode
- Displaying array status
- RAID/logical unit 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 ○ under the Password column, and are optional. The commands that can be used online have an ○ 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 ○ 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	Password	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	auuiddel	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
Array status	Displaying a Firmware Revision	aurev	O	x	x
	Displaying Drive Configuration Information	audrive	O	x	x
	Displaying the Cache Configuration Information (See *Note 2*.)	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	aucrlan	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	Password	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	auquickfmtopt	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	Password	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 *Note 1*.)	aulan	x	O	O
	Referencing/Setting the Port Option	auportop	O	O	O
	Referencing/Setting the Boot Option (See *Note 1*.)	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	Password	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	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
	Refercing/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	Password	Login
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 Informtion 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
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

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

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

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

Table 3-2: Storage Navigator Modular 2 Commands per Equipment Type

Command	9500V	AMS/ WMS	SMS	AMS 2000	Command	9500V	AMS/ WMS	SMS	AMS 2000
auunitref					aurtc				
auunitaddauto					aulan			x	x
auunitadd					auportop				
auunitchg					aubootopt	x			
auunitdel					autimezone	x			
aupasswd					aumaintelan	x			
aurev		x	x	x	auonlan	x			
audrive					aufibre1				
aucache		x	x	x	auspare			x	
ausupply		x	x	x	auopt				
auparts					audrecopt				
aupartsopt	x	x	x		auonlineverify				
aucrlan		x	x	x	aucmddev				
auinfomsg					aureboot				
auunitid		x	x	x	aulupre		x	x	x
auunitinfo	x				auhicopy		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
auformat					ausnmp				
auformatst					auemailalert	x	x		
auquickfmtopt					aulocatled	x	x	x	
auluexp		x	x	x	auadditionalunit	x	x	x	

Table 3-2: Storage Navigator Modular 2 Commands per Equipment Type

Command	9500V	AMS/ WMS	SMS	AMS 2000	Command	9500V	AMS/ WMS	SMS	AMS 2000
auludel					aulanport	x	x		
auluchg			x	x	ausslopt	x	x		
aumluref					ausyspout		x	x	x
aulumrg					auconfigout		x	x	x
auludiv					ausyspset		x	x	x
auluinvalidate		x	x	x	auconfigset		x	x	x
aulureallocate		x	x	x	auconstitute	x			
aulurestoration		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	auonsysprm		x	x	x
auhgset		x	x	x	ausysparam		x	x	x
autargetdef	x				autargetini	x			
auextprog					autargetopt	x			
auerroralert					autargetmap	x			
auerralertopt					aumicro				
ausystuning					aunnclan	x		x	x
aulutuning			x	x	aunassyslu	x		x	x
autuningprefetch	x		x	x	aunasuserlu	x		x	x
autuningmultistream	x				aunnc	x		x	x
autuningluown	x	x		x	austatistics			x	x
auaccountenv	x				auperform				
auaccountscript	x				aupfmstatiscfg				
auman					audptrend				
auencrypt	x	x	x	x					

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 xpanded 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 descreased or the current exeucted 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 formattign is not executed and the **Status** that dsiplays the uluref command exucuting 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 wanto 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 x.xx
Copyright (C) 2005, 2011, Hitachi, Ltd.

Usage:

 9500V, AMS, WMS, SMS, AMS2000

   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

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
   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 3-18
- Automatic registering on page 3-19
- Registering on page 3-21
- Changing registration information on page 3-23
- Deleting the registration information on page 3-25

Displaying the registration information

Command name

auunitref

Format

9500V, AMS, WMS, SMS, AMS2000
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

-unit unit_name

Specify the name of an array 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.

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
  When searching the disk array units of IPv4.
    auunitaddauto  -ip from_address to_address
                   [ -communicationtype nonsecure | secure | securepriority ]

SMS, AMS2000
  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

-ip from_address to_address

Specify an IPv4 address of the disk array unit to be searched.

from_address: Start IPv4 address
to_address : 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 nonsecure | secure | securepriority
Specify the communication type.

nonsecure : Searches disk array units using non-secure port.
secure : Searches disk array units using secure port.
securepriority: 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, AMS, WMS, SMS, AMS2000

```
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 ]
```

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

-unit unit_name
Specify the name of an array unit whose registration information to set up. 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. Cannot specify spaces only. If omitted this option, the name to be registered is given as "an array unit model name_serial number". (For example, AMS2300_85010123)

-group group_name
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 device | address
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)

-ctl1 device | address
Specify the device or address used to connect to Controller 1.
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, AMS, WMS, SMS, AMS2000
  auunitchg  -unit unit_name
             [ -newunit unit_name ] [ -group group_name ]
             [ -RS232C | -LAN ]
             [ -ctl0 device | address ] [ -ctl1 device | 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

-unit unit_name
Specify the name of a registered array unit.
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.

-newunit unit_name
Specify the array unit name to change.
Specify a new array unit 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. Cannot specify spaces only.

-group group_name
Specify the group name to change.
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) 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
Specify the communication type.

nonsecure : Non-secure port.
secure : Secure port.

-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                                      hsp

  SMS100  Dual        TCP/IP(LAN)     Enable          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 Ad

dress/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

-unit unit_name ...
Specify the name of the registered array unit whose registration information is to be deleted. 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 emoved. Cannot specify spaces only. 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 ams2000

-f
Omits the confirmation message when the command is executed.

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 3-27
- Displaying drive configuration information on page 3-28
- Displaying the cache configuration information on page 3-30
- Displaying the status of power supply/fan/battery/loop/ENC on page 3-31
- Displaying the status of component parts on page 3-33
- Referencing the parts options on page 3-39
- Displaying the current IP address on page 3-40
- Displaying the information messages on page 3-41
- Referencing/Setting the Equipment ID or Controller ID on page 3-42
- Displaying the Equipment Information on page 3-43

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

-unit unit_name
Specify the name of an array unit for which to display its firmware revision. 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.

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

```
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

```
-unit unit_name
        Specify the name of an array unit which its drive
configuration information is
       to be displayed. 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.

-status | -vendor
        The drive information is displayed.

          -status: The drive condition 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 unit_no
-hno hdu_no
        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   C6Cxxxxx   SATA
   1      1     HITACHI  HDS722525VLSA80 xxxx     250GB   C6Cxxxxx   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  250GB    SATA       HITACHI   HDS722525VLSA80  A60A    Cxxxxxxxx
 1     1  250GB    SATA       HITACHI   HDS722525VLSA80  A60A    Cxxxxxxxx
            :
            :
%
```

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
        :
        :
%
```

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

-unit unit_name
: Specify the name of an array unit for which to display cache configuration 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.

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.

Options

-unit unit_name
: Specify the name of an array unit for which to display the 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.

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

-unit unit_name
: Specify the name of an array unit for which to display 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.

Examples

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  Fibre Channel  Normal
   1                   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
     :
     :
%
```

Referencing the parts options

Command name

```
aupartsopt
```

Format

```
AMS2000
  aupartsopt  -unit unit_name -refer
```

Description

This command references the parts options.

Options

-unit unit_name
: Specify the name of an array unit for which to reference the parts options. 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 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

aucrlan

Format

```
9500V
  aucrlan  -unit unit_name
```

Description

This command displays the enabled LAN information of the array.

Options

-unit unit_name
Specify the name of an array unit for which to display the LAN 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.

Example

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
  auinfomsg  -unit unit_name
```

Description

This command displays the Information Messages of the specified array.

Options

-unit unit_name
: Specify the name of the array unit in which the Information Messages are to be displayed.
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.

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

```
-unit unit_name
        Specify the name of an array unit for which to reference and set the
equipment
        ID or the controller ID.
       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 equipment ID or the controller ID.
-set
        Sets the equipment ID or the controller ID.

-EquipmentID string
        Sets the equipment ID.

            string: The equipment ID (up to four numerals)

-ControllerIDFlag ctl_no enable | disable
        Specify whether to set the controller ID flag effective or ineffective.

            ctl_no : Controller number (0, 1)
            enable : Enables the controller ID.
            disable: Disables the controller ID.

-ControllerID ctl_no string
        Specify the controller ID.

            ctl_no: Controller number (0, 1)
           string: 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
  auunitinfo  -unit unit_name
```

Description

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

Options

```
-unit unit_name
        Specify the name of an array unit for which to display the equipment
        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.
```

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/logical unit commands

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

- Referencing a RAID Group on page 3-46
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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
  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

```
-unit unit_name
Specify the name of the array unit which references the definition of the RAID
group.
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.

-m | -g | -t | -auto
       Expresses the residual 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.

-detail rg_no
        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 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
%
```

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
        -type FC | SATA

 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 | SATA | 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 | SATA | SSD | SAS7K | SAS_SED | SAS_SFF
        [ -drvcapa 100 | 146 | 200 | 300 | 400 | 450 | 500 | 600 | 750 | 1000 | 2000 | 3000 ]
```

Description

This command sets up a RAID in a specified array.

Options

-unit unit_name
Specify the name of an array unit in which to set up a RAID group.
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.

-rg rg_no
Specify the RAID group number.

-RAID0 | -RAID1 | -RAID5 | -RAID10 | -RAID6
Specify the RAID level.

-hnum hdu_num
Specify the number of HDUs in the parity group of the RAID group.

-pnum pty_num
Specify the number of parity groups of the RAID group.

-uno unit_no
Specify the Unit number of the top drive in a RAID group.

-hno hdu_no
Specify the HDU number of the top drive in a RAID group.

-drive auto | unit_no.hdu_no ...
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 | 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

-drvcapa 100 | 146 | 200 | 300 | 400 | 450 | 500 | 600 | 750 | 1000 | 2000 | 3000
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.
%
```

Expanding a RAID Group

Command name

aurgexp

Format

```
9500V
  aurgexp  -unit unit_name  -rg rg_no  -pnum pty_num

SMS, AMS2000
  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

```
-unit unit_name
      Specify the name of an array unit in which a RAID group whose size to expand
        has been defined.
       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.

-rg rg_no
        Specify the RAID group number of a RAID group which is to be expanded.
```

```
-pnum pty_num
        Specify the number of parity groups after expansion.

-drive unit_no.hdu_no ...
       Specify the Unit number and HDU number punctuating them with a period to be
         expanded. Single or multiple drive numbers can be specified.

             unit_no: Unit number
             hdu_no : 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
  aurgdel  -unit unit_name  -rg rg_no ... [ -f ]

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

Description

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

Options

```
-unit unit_name
       Specify the name of an array unit in which the RAID group to be deleted is
        defined.
       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.

-rg rg_no ...
       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 logical unit

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
  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

```
-unit unit_name
Specify the name of an array unit which you want to reference the LU 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.

-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.
-last
       References the last defined LU.

-lu lun ...
  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
-nosublu
  Specify this option when not referencing the Sub LU.

-totalsize
```

```
  Specify this option when referencing the total capacity of unified Main LU.
-pathinfo
  Specify this option when referencing path information of LU
```

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.

```
% auluref  -unit ams2300a1 –g
Stripe  RAID     DP    RAID                                          Number
  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.

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

Setting up a logical unit

Command name

auluadd

Format

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

AMS, WMS
Dual System
auluadd -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
auluadd -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.
auluadd -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.
auluadd -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.
auluadd -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.
auluadd -unit unit_name
[-lu lun] -rg rg_no -size num[m | g | t] | rest
[-stripesize 64 | 256 | 512]
-createarea area_no
[-noluformat]

When creating the logical unit in two or more free areas.
auluadd -unit unit_name
[-lu lun] -rg rg_no -size num[m | g | t]
[-stripesize 64 | 256 | 512]
-createarea area_no ...
[-arealu lun]
[-noluformat]

When creating the logical unit using all free areas of RAID Group.
auluadd -unit unit_name
[-lu lun] -rg rg_no -size rgrest
[-stripesize 64 | 256 | 512]
[-arealu lun]
[-noluformat]

AMS2000
When the area is selected automatically.

When creating the logical unit in the maximum free area.
auluadd -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.
auluadd -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.
auluadd -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.
auluadd -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]
-createarea area_no
[-noluformat]

When creating the logical unit in two or more free areas.
auluadd -unit unit_name
[-lu lun] -rg rg_no -size num[m | g | t]
[-stripesize 64 | 256 | 512]
[-cachept pt_no]
[-paircachept pt_no | auto]
-createarea area_no ...
[-arealu lun]
[-noluformat]

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

AMS, WMS, SMS, AMS2000
auluadd -unit unit_name –availablelist –rg rg_no

Description

This command sets up a logical unit.

Options

-unit unit_name
Specify the name of an array unit which an LU is to be added.
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.

-lu lun
Specify the LU number of an LU to be added. If omitted, the Navigator will automatically apply an LU number.

-rg rg_no
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 pt_no
Specify the cache partition. If omitted this option, the Navigator will automatically assign the partition 0 or 1.

pt_no: Partition number

-paircachept pt_no | auto
Specify the pair cache partition. If omitted this option, the array unit makes the decision automatically.

pt_no: Pair cache partition number
auto : The array unit makes the decision automatically.

-createarea area_no ...
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

-head
Specify this option when creating LU from the top free area.

-arealu
Specify the max LU number of the free area. If omitted, the Navigator will automatically apply an LU number.

-noluformat
Specify this option when creating LU without formatting.

-availablelist
The free area of the RAID group in which the LU is to be set is displayed.

-dppoolno pool_no
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

-fullcapacity enable | 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.

```
% auluadd  -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
%
% auluadd -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.

```
% auluadd  -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 logical unit

Command name

```
auformat
```

Format

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

AMS, WMS, SMS, AMS2000
  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

-unit unit_name
Specify the name of an array unit in which an LU is to be formatted is defined. 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.

-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 LU. 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.
- -offline | -Im: Formats up to six LUs concurrently in the Immediate mode. If this mode is specified, LUs are formatted from a controller that are connected regardless of the current controller that controls the LUs. When two or more logical units are chosen, the commands from a host is rejected during the format execution. Generally, the format with this option takes shorter time than the format with '-online' or '-I' option.
- -quick : Formats up to six LUs 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 auquickfmtopt command.

```
-lu lun ...
        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: -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

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 logical unit formatting

Command name

```
auformatst
```

Format

```
9500V, AMS, WMS, SMS, AMS2000
  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

-unit unit_name
: Specify the name of an array unit in which the LUs are defined. 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.

-lu lun
: 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  -I  -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
  auquickfmtopt  -unit unit_name –refer

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

Description

This command references or sets the quick format option.

Options

-unit unit_name
Specify the name of the array unit for which to reference or set the quick format option.
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
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 cas
es, 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.
%
```

Expanding a logical unit

Command name

auluexp

Format

```
9500V
  auluexp  -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

```
-unit unit_name
        Specify the name of an array unit in which the LU whose size is to be
expanded
        is defined.
       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.
-lu lun
        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.
```

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 logical unit

Command name

```
auludel
```

Format

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

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

Description

This command deletes the specified logical unit.

For 9500V, deletes the last defined logical unit.

Options

-unit unit_name
Specify the name of an array unit in which the LUs are defined.
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.

-last
Specify this option when referencing the last defined LU.

-lu lun ...
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, Pleas
e make sure to perform backup of all important data before this operation.
When you delete 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 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, Pl
ease make sure to perform backup of all important data before this operation.
When you delete 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 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 logical unit

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

-unit unit_name
Specify the name of an array unit in which LUs have been defined.
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.
-lu lun
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 logical unit

Command name

```
aumluref
```

Format

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

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

Description

This command refers the status of the unified LU.

Options

-unit unit_name
Specify the name of an array unit which contains the unified LU 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.

-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 logical units

Command name

aulumrg

Format

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

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

Description

This command unifies the logical units.

Options

-unit unit_name
Specify the name of the subsystem whose LUs are to be unified.
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.

-lu main_lu sub_lu
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 main_lu
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 LU

Command name

aumludiv

Format

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

Description

This command separates the unified LU.

Options

-unit unit_name
Specify the name of the subsystem whose LUs are to be separated. 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.

-lu main_lu all | last
Specify the LU number to be separated.

main_lu: 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 logical unit

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

-unit unit_name
Specify the name of an array unit defined as being correlated with the LU to be invalidated.
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.

-lu lun
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 logical unit

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

-unit unit_name
Specify the name of an array unit defined as being correlated with the LU to be reassigned.
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.

-lu lun
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 new_lun
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 logical unit

Command name

aulurestoration

Format

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

Description

This command restores the invalidated LU as it was before.

Options

-unit unit_name
Specify the name of an array unit defined as being correlated with the LU to be restored.
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.
-lu lun
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
  aulucorrect  -unit unit_name –refer
               [ -status [ uncorrected ] [ aborted ] [ correcting ]
                         [ waiting ] [ skipped ]
                         [ uncorre_drvdetach ] [ waiting_drvreconst ] ]

9500V, AMS, WMS, SMS, AMS2000
  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

-unit unit_name
Specify the name of an array unit for which a status of LU correction by means of parity is to be referred to, or the correction is to be started, skipped, or aborted.
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 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 Recontruction

-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.

-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 lun ...
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 lun ...
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
  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

-unit unit_name
Specify the name of the array unit for which to reference or set the mapping guard 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.

-refer
Displays the mapping guard information.

-set
Sets the mapping guard information.

-lu lun ...
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 LU cache partition

Command name

```
aulucachept
```

Format

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

AMS, WMS, AMS200
  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

-unit unit_name
Specify the name of the array unit for which to reference or set the LU cache partition.
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
Displays the LU cache partition.

-set
Sets the LU cache partition.

-pt pt_no
Specify the partition.

pt_no: Partition number

-pairpt pt_no | auto
Specify the pair cache partition.

pt_no: Pair cache partition number
auto : The array unit makes the decision automatically.

-lu lun ...
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 LU size

Command name

auluchgsize

Format

SMS, AMS2000
```
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 rgrest
                    [ -arealu lun ]
```

AMS2000

When changing size of the logical unit in DP pool.

Description

This command changes the LU size.

Options

-unit unit_name
Specify the name of an array unit which the LU size is to be changed.
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.

-lu lun
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 "rgrest" is specified, all free area of the RAID group will be assigned.

-area area_no
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 auluadd 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.

-doptimize

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 applica
tions that use this array will terminate abnormally. Please make sure to stop th
e 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 3-83
- Referencing/setting system parameters online on page 3-86
- Referencing/setting system parameters on page 3-89
- Referencing/setting the RTC on page 3-94
- Referencing/setting LAN information on page 3-96
- Referencing/setting the port option on page 3-98
- Referencing/setting the boot option on page 3-101
- Referencing/setting the time zone on page 3-103
- Referencing/setting the IP address of the maintenance port on page 3-105
- Referencing/setting LAN information online on page 3-108



NOTE: When the AMS/WMS array connects to the NAS, restarting the array stops the cluster between the NAS units stop along and restartsthe 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
 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
  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 ]

     AMS2000
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 ]
              [HostIORestraintStateReport 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

-unit unit_name
Specify the name of an array unit in which the system parameters are to be referenced or to be 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 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.

enable : Enables the Write Unique Response Mode.
disable: Disables the Write Unique Response 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.

-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.

-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 string
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 ctl_no on | off
Specify the execution of the write & verify operation.

```
ctl_no: 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
Host I/O Restraint State Report 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

-unit unit_name
Specify the name of an array unit in which the system parameters are to be referenced or to be 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 system parameters.

-set
Sets the system parameters.

-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.

-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.

-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.

-SyncCacheAllExec enable | disable
Specify whether to set the Synchronize Cache All Execution Mode effective or ineffective.

enable : Enables the Synchronize Cache All Execution Mode.
disable: Disables the Synchronize Cache All Execution 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.

-ProcessorFailures reset | shutdown
Specify action when a processor failure occurs.

reset : Resets the failure and restarts the controller.
shutdown: Shuts down the array unit.

-inquiryCommandQueue on | off
Specify execution of command queuing for INQUIRY response information.

on : Executes command queuing.
off: Suppresses command queuing.

-WebTitle string
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 ctl_no off | normal | hitrack
Sets the mode of sending out error information onto RS232C.

ctl_no : Controller number (0, 1).
off : Does not send out information.
normal : Sends out information.
hitrack: Sends out information in the HITRACK mode.

-WriteVerifyExecution ctl_no on | off
Specify the execution of the write & verify operation.

ctl_no: 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 ----
RS232C Error Information Outflow Mode = OFF
Write & Verify Execution Mode = ON
%
```

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 ctl_no ]
             [ -DataShare            used | notUsed ]
             [ -DelayPlannedShutdown time ]
             [ -DriveDetach          enable | disable ]
             [ -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 ]
             [ -ProcessorFailures    reset | shutdown ]
             [ -inquiryCommandQueue  on | off ]
             [ -inquiryVendor        string ]
             [ -inquiryProduct       string ]
             [ -inquiryRomMicro      string ]
             [ -inquiryRamMicro      string ]
             [ -WebTitle             string ]
             [ -Rs232cOutflow        ctl_no off | normal | hitrack ]
             [ -WriteVerifyExecution ctl_no on | off ]
             [ -dhcp                 ctl_no enable | disable ]
             [ -IPAddress            ctl_no inet_addr ]
             [ -SubnetMask           ctl_no netmask ]
             [ -DefaultGateway       ctl_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

-unit unit_name
Specify the name of an array unit in which the system parameters are to be referenced or to be 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 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 port_no ctl_no
Specify the default controller of each port when a dual active configuration used the SCSI ID take over.

port_no: Port number (A, B, C, D).
ctl_no : 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.

-DelayPlannedShutdown time
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.

-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.

-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.

-SyncCacheAllExec enable | disable
Specify whether to set the Synchronize Cache All Execution Mode effective or ineffective.

enable : Enables the Synchronize Cache All Execution Mode.
disable: Disables the Synchronize Cache All Execution 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.

-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.

-inquiryCommandQueue on | off
Specify execution of command queuing for INQUIRY response information.

on : Executes command queuing.
off: Suppresses command queuing.

-inquiryVendor string
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 string
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 string
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 string
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 string
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 ctl_no off | normal | hitrack
Sets the mode of sending out error information onto RS232C.

ctl_no : Controller number (0, 1).
off : Does not send out information.
normal : Sends out information.
hitrack: Sends out information in the HITRACK mode.

-WriteVerifyExecution ctl_no on | off
Specify the execution of the write & verify operation.

ctl_no: Controller number (0, 1).
on : Executes write & verify operation.
off : Does not execute write & verify operation.

-dhcp ctl_no enable | disable
Specify whether the DHCP mode is enable or disable.

ctl_no : Controller number (0, 1).
enable : Enables the DHCP mode.
disable: Disables the DHCP mode.

-IPAddress ctl_no inet_addr
Specify the IP address.

ctl_no : Controller number (0, 1).
inet_addr: IP address (format xxx.xxx.xxx.xxx).

-SubnetMask ctl_no netmask
Specify the subnet mask.

ctl_no : Controller number (0, 1).
netmask: Subnet mask (format xxx.xxx.xxx.xxx).

-DefaultGateway ctl_no gateway
Specify the default gateway.

ctl_no : Controller number (0, 1).
gateway: 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

```
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

-unit unit_name
Specify the name of an array unit in the RTC is 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 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 yyyy/mm/dd
Specify the date to be set.

yyyy: in A.D. (2000 to 2099) (For 9500V, 1990 to 2089).
mm : month (01 to 12).
dd : day (01 to 31).

-time HH:MM:SS
Specify the time to be set.

HH: hour (00 to 23).
MM: minute (00 to 59).
SS: 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

-unit unit_name
Specify the name of an array unit for which to reference and set LAN 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.

-refer
References LAN information.

-set
Sets LAN information.

-ctl0 | -ctl1
Specify the controller.

-addr inet_addr
Specify the IP addresses.

-mask netmask
Specify the subnet masks.

-gate gateway
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 effe
ctive 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 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: 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 appeard 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
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

Description

This command references and sets the port option.

Options

-unit unit_name
Specify the name of the array unit for which to reference or set the port option.
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 port option.
-set
Sets the port option.

-PortTypeOption ctl_no port_no ResetLipSignal | ResetLipProcess | LipPortAllReset |
ReadFrameMin128 | CrossCtlIO CmdUniqueResponse | PLOGITimeout Prevention |
DisableAutodiscoverNewHG
enable | disable

ctl_no : Controller number (0, 1).

port_no : 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)
CrossCt1IO: Sets CPU Load Reduction for Cross-CTL I/O Mode. I/O Mode. (For SMS and AMS2000)
CmdUniqueResponse: Sets Command Unique Response Mode. (For SMS and AMS2000)
PLOGITimeoutPrevention: Sets PLOGI Timeout Prevention Mode.
(For SMS and AMS2000)
DisableAudodiscoveryNewHG: 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
PLOGI Response Quick Mode
  Port 0A = OFF
  Port 0B = OFF
%
```

Referencing/setting the boot option

Command name

aubootopt

Format

```
AMS, WMS, SMS, AMS2000
  aubootopt  -unit unit_name –refer

AMS, WM
  aubootopt  -unit unit_name –set
          [ -SystemStartup       Single | Dual ]
          [ -DelayPlannedShutdown time ]
          [ -DriveDetach         enable | disable ]
          [ -inquiryVendor       string ]
          [ -inquiryProduct      string ]
          [ -inquiryRomMicro     string ]
          [ -inquiryRamMicro     string ]
SMS, AMS2000
  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

-unit unit_name
Specify the name of an array unit for which to reference or set the boot option. 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 boot option.

-set
Sets the boot option.

-SystemStartup Single | Dual
Specify the configuration of an array unit.

Single: Single
Dual : Dual

-DelayPlannedShutdown time
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.

-inquiryVendor string
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 string
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 string
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 string
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 "".

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
```
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

-unit unit_name
Specify the name of the array unit for which to reference or set the time zone/NTP server.
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
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 num
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 address
Specify NTP server1 IP address. To cancel the specification, enter "".

-ntp2 address
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
   :
%
```

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
 aumaintelan -unit unit_name –refer

AMS, WMS
 aumaintelan -unit unit_name -set -addr ip_addr

SMS, AMS2000
 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
  aumaintelan  -unit unit_name –availablelist [ -ipv4 ] [ -ipv6 ]
```

Description

This command references or sets the IP address of maintenance port.

Options

-unit unit_name
 Specify the name of the array unit for which to reference or set the IP address of maintenance port.
 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
 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 ip_addr
 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 ipv6_addr
 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
 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 ]
        [ -mipchgmode enable | disable ]

SMS, AMS2000
 When setting the IPv4
  auonlan  -unit unit_name –set
         [ -mipchgmode 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

-unit unit_name
: Specify the name of the array unit for which to reference and set LAN 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.

-refer
: References LAN information.

-set
: Sets LAN information.

-ctl0_addr inet_addr
: Specify the IPv4 address of Controller 0.

inet_addr: IPv4 address

-ctl0_mask netmask
Specify the IPv4 subnet mask of Controller 0.

netmask: IPv4 subnet mask

-ctl0_gate gateway
Specify individual IPv4 default gateway of Controller 0.

gateway: 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 inet_addr
Specify the IPv4 address of Controller 1.

inet_addr: IPv4 address

-ctl1_mask netmask
Specify the IPv4 subnet mask of Controller 1.

netmask: IPv4 subnet mask

-ctl1_gate gateway
Specify individual IPv4 default gateway of Controller 1.

gateway: 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

-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.

-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.

-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 ipv6_addr
Specify the IPv6 address of the Controller 0.

ipv6_addr: IPv6 address

-ipv6_ctl0_prefix ipv6_subnet_prefix
Specify the IPv6 subnet prefix length of the Controller 0.

ipv6_subnet_prefix: IPv6 subnet prefix length

-ipv6_ctl0_gate ipv6_gateway
Specify individual IPv6 default gateway of Controller 0.

ipv6_gateway: 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 ipv6_addr
Specify the IPv6 address of the Controller 1.

ipv6_addr: IPv6 address

-ipv6_ctl1_prefix ipv6_subnet_prefix
Specify the IPv6 subnet prefix length of the Controller 1.

ipv6_subnet_prefix: IPv6 subnet prefix length

-ipv6_ctl1_gate ipv6_gateway
Specify individual IPv6 default gateway of Controller 1.

ipv6_gateway: 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 3-114
- Referencing/setting the spare HDU on page 3-116
- Referencing/Setting the Fee-Basis Option on page 3-118
- Referencing/setting the drive restoration control information on page 3-120
- Referencing/setting the online verify information on page 3-123
- Referencing/setting the command device information on page 3-125
- Rebooting on page 3-127
- Referencing/setting LU pre-fetch information on page 3-129
- Referencing/splitting the Hi-Copy Pair information on page 3-130
- Referencing/setting the DM-LU information on page 3-132
- Referencing/setting the iSCSI port information on page 3-133
- Referencing/setting the CHAP user information on page 3-136
- Referencing/sending a ping on page 3-139
- Referencing/setting the backend diagnosis information on page 3-140
- Setting the SNMP environment information and outputting its file on page 3-141
- Referencing/setting e-Mail alert information on page 3-142
- Referencing/setting the LED information on page 3-145
- Referencing/Starting additional unit information on page 3-147
- Referencing/setting LAN port information on page 3-148
- Setting the SSL option on page 3-150

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 twhen 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
  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 | 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 ]
```

Description

This command references or sets the fibre channel information.

Options

-unit unit_name
Specify the name of an array unit for which to reference, set, and delete fibre channel 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.

-refer
Displays fibre channel information.

-set
Sets fibre channel information.

-topo ctl_no port_no loop | ptop
Specify the topology of the specified port.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D, E, F, G, H)
loop   : Loop
ptop   : Point-to-Point

-rate ctl_no port_no 1 | 2 | 4 | 8 | auto
Specify the fibre channel transfer rate of the specified port.

ctl_no : Controller number (0, 1)
port_no: 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 ctl_no port_no port-address
Specify the port address of the specified port.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D, E, F, G, H)
port-address: 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 h
ost.
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
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

-unit unit_name
Specify the name of the array unit which the spare HDU is to be set or canceled. 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 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 unit_no
Specify the unit number of the spare HDU.

-hno hdu_no
Specify the HDU number of the spare HDU.

```
-drive unit_no.hdu_no ...
        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.

            unit_no: Unit number
            hdu_no : 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
 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
   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
   auopt  -unit unit_name -lock on -keycode key_code
AMS2000
 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

-unit unit_name
Specify the name of the array unit to setup or reference the fee-basis option.
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
Displays an already unlocked (installed) fee-basis option.

-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 key_code
Specify the key code when unlocking or locking the fee-basis option.

-licensefile license_file_path
Specify the path of the license key file when unlocking the fee-basis option.

license_file_path: The path of the license key file.

-all
Specify this option when unlocking (installing) all fee-basis options at license key file.

```
-option option-name
       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
  audrecopt  -unit unit_name –refer

9500V
  audrecopt  -unit unit_name –set
             [ -restor back | normal | priority ] [ -auto enable | disable ]
             [ -sparing rwv | rw | not ] [ -interval interval_time ]
             [ -size n ]
AMS, WMS
  audrecopt  -unit unit_name –set
             [ -restor back | normal | priority ] [ -auto enable | disable ]
             [ -sparing rwv | rw | not ] [ -interval interval_time ]
             [ -size n ]
             [ -spare variable | fixed ]
             [ -allunitnocopyback enable | disable ]
SMS, AMS2000
  audrecopt  -unit unit_name –set
             [ -restor back | normal | priority ] [ -auto enable | disable ]
             [ -sparing rwv | rw | not ] [ -interval interval_time ]
             [ -size n ]
             [ -spare variable | fixed ]
```

Description

This command references and sets the drive restoration control information.

Options

-unit unit_name
Specify the name of an array unit in which the drive restoration control information is to be referenced or to be 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 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 interval_time
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 nterval of every 100 ms.
-size n
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)

-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
 auonlineverify  -unit unit_name –refer


9500V, SMS
  auonlineverify  -unit unit_name –set
                  [ -verify enable | disable ]
                  [ -skipverify on | off ]
AMS, WMS, AMS2000
  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

-unit unit_name
Specify the name of an array unit for which to reference and set online verify 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.

-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 to set the skip verify effective or ineffective.

on : Enables the skip verify.
off: Disables the skip verify.

-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
```
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
```
aucmddev  -unit unit_name -availablelist
```

Description

This command references and sets the command device.

Options

-unit unit_name
Specify the name of an array unit in which the command device information is 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 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 n lu [ 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.

            n      : Command device number (1 or 2).
            lu     : Logical unit number.
            enable : Enables the protection function of RAID Manager (CCI).
            disable: Disables the protection function of RAID Manager (CCI).

-dev n
        Specify the command device number to be deleted.

            n: 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
aureboot -unit unit_name

When performing only a shutdown and not rebooting.

Description

This command reboots the array after a shutdown.

Options

-unit unit_name
Specify the name of the array unit that is to be rebooted.
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.

-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 LU 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

```
-unit unit_name
     Specify the name of the array unit for which to reference or set the LU
     pre-fetch 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.
-refer
     Displays the LU pre-fetch information.
-lu lun
     Specify the LU number of an LU whose pre-fetch information is to be set.

-stag num | 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

```
-unit unit_name
      Specify the name of the array unit for which to reference or split the
      Hi-Copy pair 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.
-refer
      Displays the Hi-Copy pair information.
-split
      Splits the Hi-Copy pair.

-lu lun ...
      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 lun
      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 DM-LU 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

```
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

-unit unit_name
Specify the name of the array unit for which to reference or set the DM-LU 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.

-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 lun
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
  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 ]
```

Description

This command references or sets the iSCSI port information.

Options

-unit unit_name
Specify the name of the array unit for which to reference or set the iSCSI port 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.

-refer
References the iSCSI port information.

-set ctl_no port_no
Sets the iSCSI port information.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-addr inet_addr
Specify the IP address.

inet_addr: IP address

-mask netmask
Specify the subnet mask.

netmask: Subnet mask

-gate gateway
Specify individual default gateway.

gateway: Default gateway

-portnum port_num
Specify the port number for TCP/IP communication.

port_num: Port number

-timer time
Specify the Keep Alive Timer.

time: Keep Alive Timer (second)

-mtu 1500 | 4500 | 9000
Specify the MTU.

Examples

The following example displays the iSCSI port information for an array ams500.

```
% auiscsi -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.

```
% auiscsi -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 p
orts on the controller side with setting port from the host.
Before setting, stop access to all ports on the controller side with setting por
t 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.

```
% auiscsi -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
  Header Digest           :       Enable
  Data Digest             :       Enable
Port 0B
    :
    :
%
```

Referencing/Setting the iSNS Information

Command name

```
auisns
```

Format

```
AMS, WMS, SMS, AMS2000
  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

-unit unit_name
Specify the name of the array unit for which to reference or set the iSNS 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.

-refer
References the iSNS information.

-set ctl_no port_no
Sets the iSNS information.

ctl_no : Controller number (0, 1)
port_no: 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 inet_addr
Specify the IP address.

inet_addr: IP address

-portnum port_num
Specify the port number for TCP/IP communication.

port_num: 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

-unit unit_name
Specify the name of the array unit for which to reference or set CHAP user 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.

-refer [ctl_no port_no]
References CHAP user information.
CHAP user information list is sorted by the CHAP user name.
When the ctl_no port_no is not specified:
CHAP user name of the all ports is displayed.
When the ctl_no port_no 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 ctl_no port_no
Sets CHAP user information.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-chg ctl_no port_no
Changes CHAP user information.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-rm ctl_no port_no
Deletes CHAP user information.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-assign ctl_no port_no
Assigns CHAP user to the target.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-release ctl_no port_no
Releases the target from CHAP user.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-availablelist ctl_no port_no
A list of targets that can be assigned to the specified controller number, port number, and CHAP user is displayed.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-user user_name
Specify CHAP user name.

user_name: CHAP user name (See Note 1)

-userfile file_name
Specify the file(path) name when setting the CHAP user name using a file.

file_name: File(path) name

-tno target_no ...
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

target_no: Target number

-talias target_alias ...
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

target_alias: Target alias (See Note 2)

-newuser new_user_name
Specify CHAP user name to be changed.

new_user_name: CHAP user name (See Note 1)

-newuserfile file_name
Specify the file(path) name when changing the CHAP user name using a file.

file_name: 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
```
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

-unit unit_name
Specify the name of the array unit for which to reference the status or sends Ping.
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 result of Ping execution.

-start ctl_no port_no
Sends Ping from the specified port.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-addr inet_addr
Specify the IP address.

inet_addr: 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

-unit unit_name
: Specify the name of the array unit for which to reference and set the backend diagnosis 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.

-refer
: References the backend diagnosis information.

-set
: Sets the backend diagnosis information.

-autodiagthres num
: 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

```
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

-unit unit_name
: Specify the name of an array unit in which the SNMP environment information file is to be read and setup.
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.

-get
: Reads the SNMP environment information and outputs it into a specified file. Specify one or more options from "-config" or "-name".

-set
: Sets up the contents of a specified SNMP environment information file in the array unit. Specify one or more options from "-config" or "-name".

-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
  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
                  -mailsrvaddr 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 ]
                  [ -mailsrvaddr 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

-unit unit_name
: Specify the name of the array unit for which to reference or set the E-Mail Alert 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.

-refer
: References the E-Mail Alert information.

-testmail
: Sends a test mail.

-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 domain_name
Specify the domain of the mail server.
Specify the domain in less than or equal to 255 alphanumeric characters or codes.

domain_name: Domain of the mail server

-mailsrvaddr server_address
Specify the mail server IP address.

server_address: Mail server IP address

-fromaddr from_address
Specify the source mail address. Specify the source mail address in less than or equal to 63 alphanumeric characters or codes.

from_address: Source mail address

-toaddr to_address
Specify the destination mail address. Specify the destination mail address in less than or equal to 63 alphanumeric characters or codes.

to_address: 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 reply_address
Specify the reply mail address. Specify the reply mail address in less than or equal to 63 alphanumeric characters or codes.

reply_address: Reply mail address

-newtoaddr new_to_address
Specify the changed destination mail address. Specify the destination mail address in less than or equal to 63 alphanumeric characters or codes.

new_to_address: 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
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

-unit unit_name
Specify the name of the array unit for which to reference or sets the LED 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.
-refer
References the LED information.
-set
Sets the LED information.

-uno unit_no ... on | off
Specify the unit number which instructs turning on or off of the LED.

unit_no: 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.

-ctu on | off
Specify turning on or off of the LED on controller unit.

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

-unit unit_name
Specify the name of the array unit for which refers to the additional unit information or starts the addition.
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 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
  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 ]
```

Description

This command references and sets LAN port information.

Options

-unit unit_name
Specify the name of the array unit for which to reference and set LAN port 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.

-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 port_num
Specify the port number of non-secure port.

port_num: Port number

-secureportnum port_num
Specify the port number of secure port.

port_num: Port number

Examples

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 nu
mber of df-damp-snm in the file.
%
```

Setting the SSL option

Command name

```
ausslopt
```

Format

```
SMS, AMS2000
  ausslopt  -unit unit_name -import -certificate file_name
```

Description

This command sets the SSL option.

Options

-unit unit_name
Specify the name of the array unit that sets the SSL option.
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.

-import
Imports the SSL certificate.

-certificate file_name
Specify the name of the file(path) to set the SSL certificate.

file_name: 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 SATA Write and Compare

Command name

```
ausatawrcmp
```

Format

```
SMS, AMS2000
  austawrcmp -unit unit_name -refer

  austawrcmp -unit unit_name -set -satawrcmp enable | disable

  austawrcmp -unit unit_name -export file_name

  austawrcmp -unit unit_name -import file_name
```

Description

This command references or sets SATA Write & Compare.
This command outputs SATA Write & Compare of the array unit to a specified file in a text format. This command sets SATA Write & Compare described in a file to the array unit.

-refer
Reference SATA Write & Compare.

-set
Sets SATA Write & Compare.

-export file_name
Specify the name of the file (path) to output SATA Write & Compare.

file_name: file (path) name.

-import file_name
Specify the name of the file (path) to set SATA Write & Compare.

file_name: file (path) name.

-satawrcmp enable | disable
Specify whether to set SATA Write & Compare effective or ineffective.

enable | Enables SATA Write & Compare.
Disable: Disables SATA Write & Compare.

Options

-unit unit_name
Specify the name of the array unit for which to reference or set SATA Write & Compare. 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.

Example

The following example displays SATA Write & Compare of an array unit ams2300a1

```
% ausatawrcmp -unit ams2300a1 -refer
SATA Write & Compare : Enable
%
```

The following example sets SATA Write & Compare to disable an array unit ams2300a1.

```
% ausatawrcmp -unit ams2300a1 -set -satawrcmp disable
Are you sure you want to set SATA Write & Compare? [y/n [n]): y
Disabling SATA Write & Compare increases the risk of data corruption if a drive fails.
For this reason, Hitachi does not recommend disabling this feature for critical and non-replicated information.
Disabling SATA Write & Compare may be appropriate for most other types of data, especially duplicated data.
```

```
Make sure to evaluate the risks before disabling this feature.
Do you want to continue processing? (y/n [n]): y
SATA Write & Compare has been set successfully.
%
```

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 3-154
- Controller parameters on page 3-159
- File output configuration of RAID/LU and status on page 3-160
- Changing the Advanced Security Mode on page 3-169
- Setting the system parameters with a file on page 3-170
- Setting the RAID/LU definition with a file on page 3-172
- Import/export the system constituent information on page 3-174

File output of system parameters

Command name

ausyspout

Format

```
9500V
  ausyspout  -unit unit_name -file file_name
```

Options

```
-unit unit_name
        Specify the name of an array unit whose system parameters are to be
output into
        the file.
       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.

-file file_name
        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 3-155 describes the fields of this output.

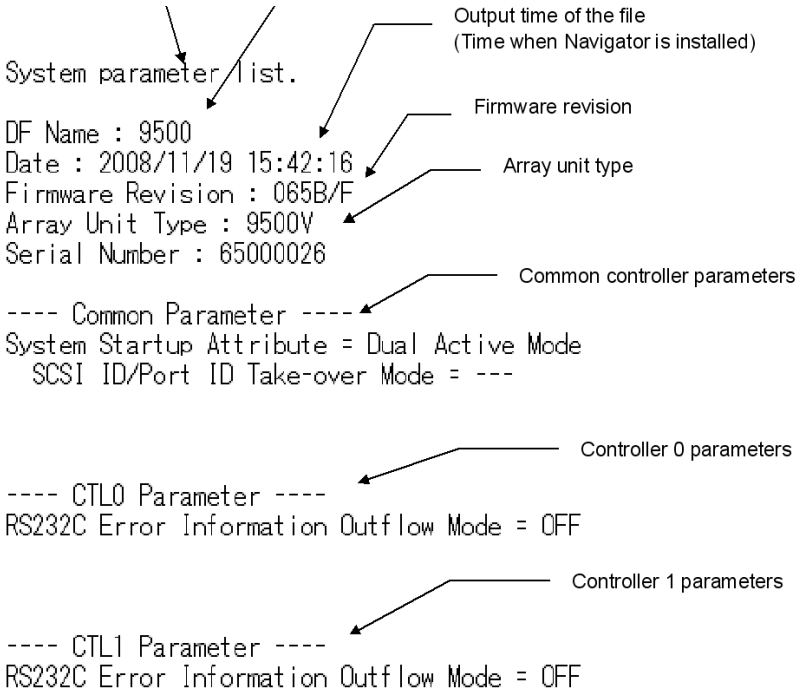


Figure 3-1: Format of System Parameter Output File

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 3-3 describes the common controller parameters.

Table 3-3: 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 3-3: 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
	ShawdowImage I/O Switch Mode	ShawdowImageIOSwitch
	Synchronize Cache All Execution	SyncCacheAllExec
	Synchronize Cache Invalid	SyncCacheInvalid

Table 3-3: 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.

```
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 3-4.

Table 3-4: 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/LU 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

-unit unit_name
Specify the name of the array unit that outputs the RAID/LU configuration and constituent parts status file.
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.

-file file_name
Specify the name of a file (path) into which 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 3-162 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

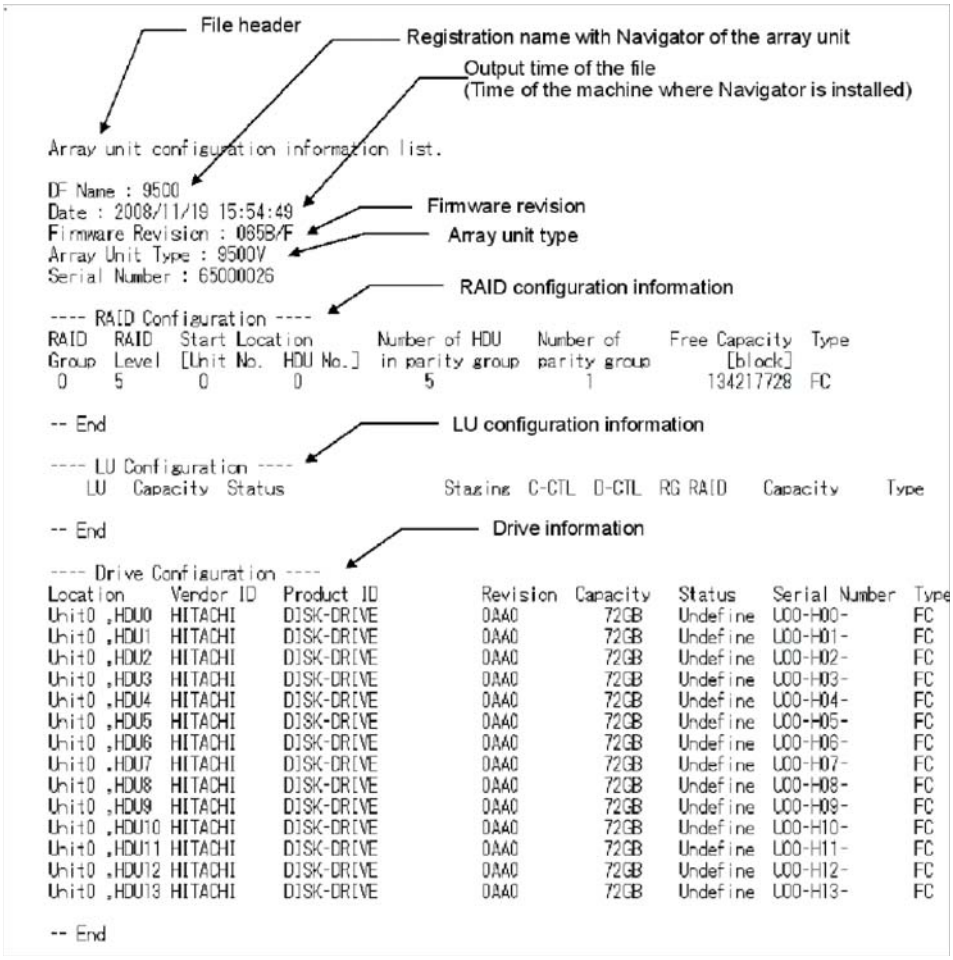


Figure 3-4: RAID/LU Configuration Information Output File Format

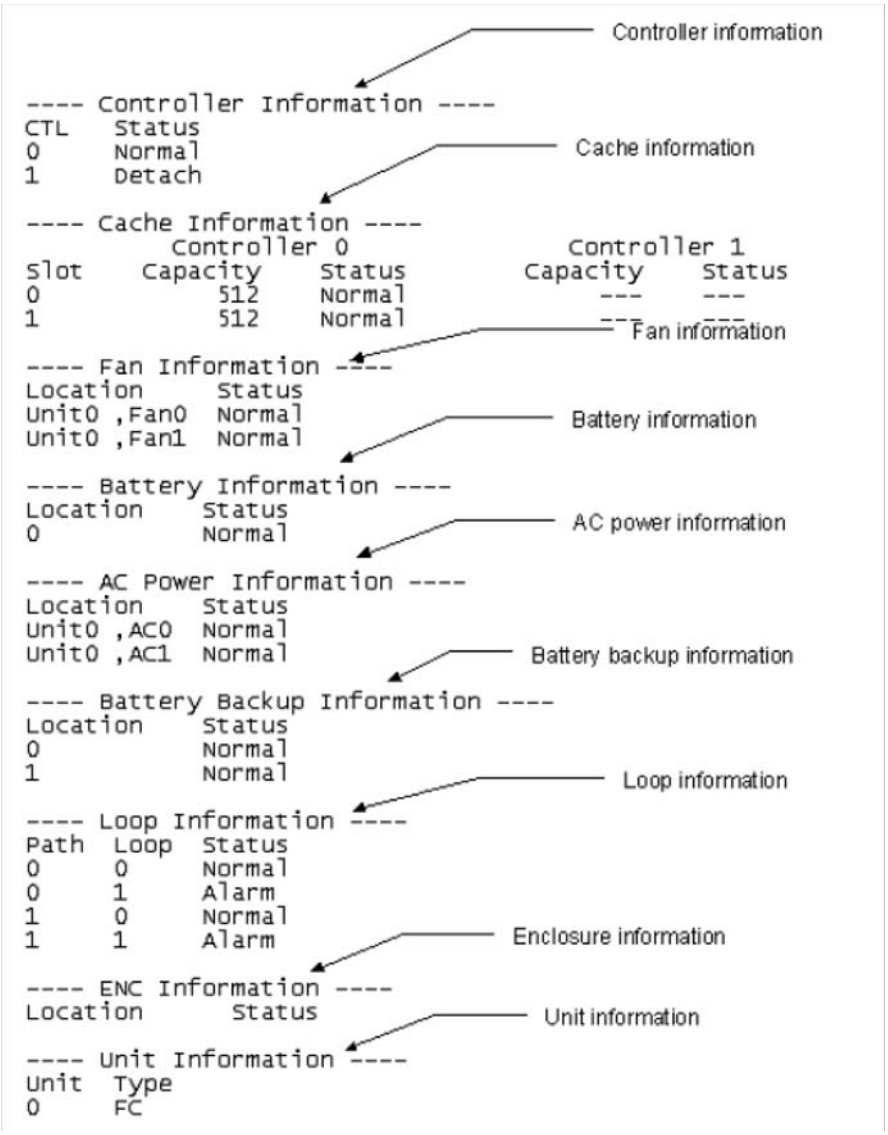


Figure 3-5: RAID/LU Configuration Information Output File Format

The function outputs the RAID configuration of the array. RAIDs that have not been created appear as "-" in the "Level" column.

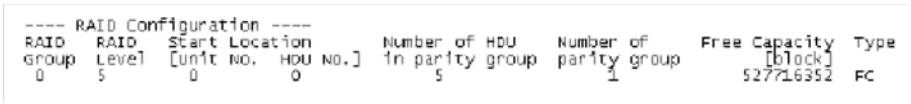


Figure 3-6: RAID Array Configuration

Table 3-5: 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.

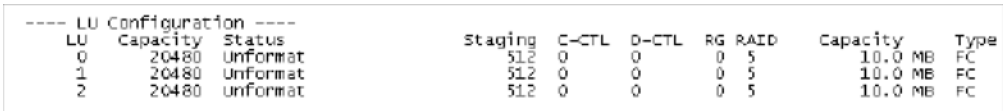


Figure 3-7: LU Configuration of the Array

Table 3-6: LU 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 3-6: LU 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     Undefine  304Z8738       FC
Unit0 ,HDU6  HITACHI     DK32DJ-72FC         K0K0        72GB     Undefine  305M9732       FC
Unit0 ,HDU7  HITACHI     DK32DJ-72FC         K0K0        72GB     Undefine  305L6000       FC
Unit0 ,HDU8  HITACHI     DK32DJ-72FC         K0K0        72GB     Undefine  305B0318       FC
Unit0 ,HDU9  HITACHI     DK32DJ-72FC         K0K0        72GB     Undefine  305N4614       FC
Unit0 ,HDU10 HITACHI     DK32DJ-72FC         K0K0        72GB     Undefine  305N8964       FC
Unit0 ,HDU11 HITACHI     DK32DJ-72FC         K0K0        72GB     Undefine  305L3562       FC
Unit0 ,HDU12 HITACHI     DK32DJ-72FC         K0K0        72GB     Undefine  305J2062       FC
Unit0 ,HDU13 HITACHI     DK32DJ-72FC         K0K0        72GB     Undefine  305N1101       FC
```

Figure 3-8: Information and Status of the Drive

Table 3-7: 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	Firmwave revision of the drive
Capacity	Capacity of the drive.
Status	Status of the drive.
Normal	Normal (RAID, LU defined).
Detached	Detached.
Standby	Normal (LU undefined).

Table 3-7: Drive Status Information (Continued)

Drive Status Information	Description
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.

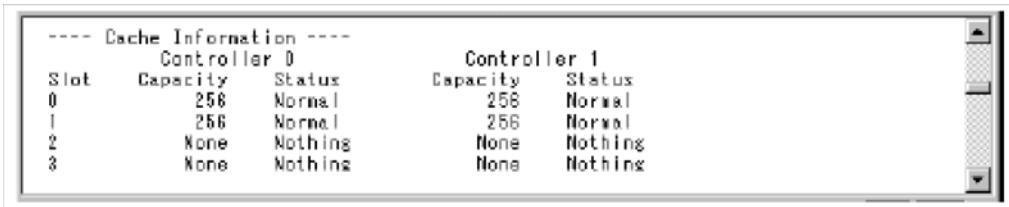


Figure 3-9: Information and Status of the Array Cache

Table 3-8: 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.

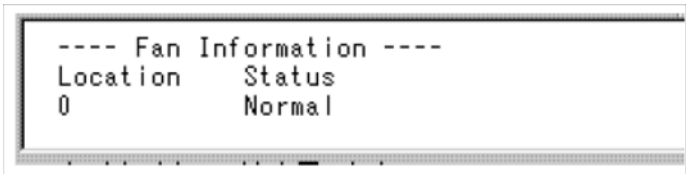


Table 3-9: Fan Information

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.



Table 3-10: 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.



Table 3-11: 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.



Table 3-12: 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.



Table 3-13: 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.



Table 3-14: 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.

Options

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.

Options

-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 "- (minus)", "_ (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/LU 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

-unit unit_name
Specify the name of the array unit to be set with the RAID/LU configuration. 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.

-file file_name
Specify the name of 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 delet
ed.
If you delete 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 delete 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 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 |
                -sysp        file_name |
                -hg          file_name |
                -bootopt     file_name |
                -parts       file_name |
                -sysluuserlu file_name
  auconstitute  -unit unit_name –export
                -config      file_name |
                -sysp        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 |
                -sysp        file_name |
                -hg          file_name
                             [ -portop ] [ -opt ] [ -map ] [ -wwn ] |
                -bootopt     file_name |
                -sysluuserlu file_name
  auconstitute  -unit unit_name –import
                -config      file_name |
                -sysp        file_name |
                -bootopt     file_name |
                -sysluuserlu file_name |
                -port        file_name
                             [ -portop ] [ -opt ] [ -map ] [ -wwn ]
                             [ -iscsiportop ] [ -targetopt ] [ -targetmap ]
                             [ -initiator ] [ -iscsi ] [ -isns ] |
                -chapuser    file_name |
                -lan         file_name


SMS
  auconstitute  -unit unit_name –export
                -config      file_name |
                -sysp        file_name |
                -bootopt     file_name |
                -parts       file_name |
                -port        file_name |
                -lan         file_name

  auconstitute  -unit unit_name –import
                -config      file_name |
                -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

AMS2000
  auconstitute  -unit unit_name –export
                -config      file_name
                             [ -rglu | -dplu | -rgdplu ] |
                -sysp        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

-unit unit_name
Specify the name of the array unit that exports or imports the system constituent 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.

-export
Exports the system constituent information.

-import
Imports the system constituent information.

-config file_name
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 file_name
Specify the name the file(path) to output/set the system parameters.

-hg file_name
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 file_name
Specify the name the file(path) to output/set the boot option.

-parts file_name
Specify the name the file(path) to output the parts information.

-sysluuserlu file_name
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 file_name
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.

-targetmap
Specify when setting up the mapping information of the target.

-initiator
Specify when setting up the initiator information.

-iscsi
Specify when setting up the iSCSI port information.

-isns
Specify when setting up the iSNS information.

-chapuser file_name
Specify the name the file(path) to set CHAP user information.

-lan file_name
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 3-15 on page 3-176.

Table 3-15: 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 delet
ed.
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. Pl
ease make sure to perform backup of all important data before this operation.
When you delete 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 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/LU Information onto a File

Command name

```
auconfigreport
```

Format

```
AMS, WMS
  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
  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 ]
```

Description

This command outputs the RAID group or LU information to a specified file.

Options

-unit unit_name
Specify the name of an array unit which you want to output RAID group or LU 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.

-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 [raidlevel] [paritygroups] [type] [totalcapacity] [freecapacity] [priority] [capacity] [stipesize] [rgnum] [dpnum] [pathinfo] [status] [recoveryinfo]
Specify the item to output.
When the specification omitted, it outputs all items.
When the -resource rg is specified:

raidlevel	:	RAID level
paritygroups	:	number of parity groups
type	:	drive type
totalcapacity	:	total capacity
freecapacity	:	free capacity
priority	:	priority of DP optimization
status	:	status
recoveryinfo	:	reconstruction progress

When the -resource lu is specified:

capacity	:	capacity
stripesize	:	stripesize
rgnum	:	RAID group number
dpnum	:	DP pool number
raidlevel	:	RAID level
type	:	drives type
pathinfo	:	number of paths
status	:	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 file_name
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 -resorce 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 Storage Navigator Modular 2 has been installed.

```
% auconfigreport -unit ams2300a1 -filetype csv -resorce 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,     0                  Normal
1,    50,       0 GB, 256KB,       0             N/A,      6( 8D+2P ),SAS,     0                  Normal
1000, 10,       0 GB, 256KB,       0             N/A,      6( 8D+2P ),SAS,     0                  Normal
1001, 10,       0 GB, 256KB,       1             N/A,      6( 8D+2P ),SAS,     0                  Normal
1022, 200,      0 GB, 256KB,       1             N/A       6( 8D+2P ),SAS,     0                  Normal
2000, 1,        0 TB, 256KB,       N/A           49        6( 8D+2P ),SAS,     0                  Normal
2001, 1,        0 TB, 256KB,       N/A           49        6( 8D+2P ),SAS,     0                  Normal
```

Host groups information

This section covers the following commands related to host groups:

- Referencing/setting host information on page 3-181
- Referencing/setting host group options on page 3-186
- Referencing/setting mapping information on page 3-200
- Referencing/registration/changing/deleting a host group on page 3-202
- File output of host group information on page 3-204
- Setting the host group information with a file on page 3-207

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 [ -wname 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
          -newwname new_wwn_name

  When specifying the wwn name.
   auhgwwn  -unit unit_name –assign
          -permhg ctl_no port_no -wname wwn_name
          -gno group_no | -gname group_name

   auhgwwn  -unit unit_name –rm
          [ -perm   ctl_no port_no -wname wwn_name ]
          [ -permhg ctl_no port_no -wname wwn_name
          -gno group_no | -gname group_name ]

   auhgwwn  -unit unit_name –chg
          -rename ctl_no port_no -wname wwn_name
          -gno group_no | -gname group_name
          -newwname 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
 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 [ -wname 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
        -newwname new_wwn_name

When specifying the wwn name.
auhgwwn  -unit unit_name –assign
        -permhg ctl_no port_no -wname wwn_name
        -gno group_no | -gname group_name

auhgwwn  -unit unit_name –rm
        [ -perm   ctl_no port_no -wname wwn_name ]
        [ -permhg ctl_no port_no -wname wwn_name
        -gno group_no | -gname group_name ]

auhgwwn  -unit unit_name –chg
        -rename ctl_no port_no -wname wwn_name
        -gno group_no | -gname group_name
        -newwname new_wwn_name
```

Description

This command references or sets the host information.

Options

```
-unit unit_name
      Specify the name of the array unit for which to reference, set, delete, assign,
      or change the host 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.
-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 ctl_no port_no
      Displays the host information that is logged in on the specified port.

         ctl_no : Controller number (0, 1)
         port_no: Port number (A, B, C, D, E, F, G, H)

-permhg ctl_no port_no
    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.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, C, D, E, F, G, H)

-hgs ctl_no port_no on | off
Specify whether to validate or invalidate the host group security of the specified port.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, C, D, E, F, G, H)
on : Enables the host group security.
off : Disables the host group security.

-perm ctl_no port_no
Specify the host information to be deleted from that logged in on the specified port.
Specification of the -wname option is indispensable.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D, E, F, G, H)

-rename ctl_no port_no
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 -newwname option is indispensable.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D, E, F, G, H)

-wname wwn_name
Specify a WWN name of the host. Space in front and in the rear of the character string is removed. Cannot specify spaces only.

wwn_name: WWN name (See Note 1)

-gno group_no
Specify a host group number.

group_no: Host group number

-gname group_name
Specify a host group name.

group_name: Host group name (See Note 1)

-newwname new_wwn_name
Specify the changed WWN name.

new_wwn_name: WWN 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))

9500V only:

-permhg ctl_no port_no node_name port_name
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 hasbeen assigned to the specified host group.
Specification of the -gno or -gname option is indispensable.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D)
node_name: Node name of the host (16 hexadecimal characters)
port_name: Port name of the host (16 hexadecimal characters)

-perm ctl_no port_no node_name port_name
Specify the host information to be deleted from that logged in on the specified port.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D)
node_name: Node name of the host (16 hexadecimal characters)
port_name: Port name of the host (16 hexadecimal characters)

-rename ctl_no port_no node_name port_name
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 -newwname option is indispensable.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D)
node_name: Node name of the host (16 hexadecimal characters)
port_name: Port name of the host (16 hexadecimal characters)

-lus ctl_no port_no on | off
Specify whether the LUN security of the specified port is enabled or disabled.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, C, D)
on : Enables the LUN Security.
off : Disables the LUN Security.

-luschk ctl_no port_no inqc | allc
Specify the LUN security check level of the specified port.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, C, D)
inqc : Check with an INQUIRY SCSI command.
allc : Check with all the SCSI commands.

-perm ctl_no port_no node_name port_name
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.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D)
node_name: Node name of the host (16 hexadecimal characters)
port_name: Port name of the host (16 hexadecimal characters)

-permlu ctl_no port_no node_name port_name lun...
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.)

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D)
node_name: Node name of the host (16 hexadecimal characters)
port_name: Port name of the host (16 hexadecimal characters)
lun... : LU number

-permluall ctl_no port_no node_name port_name
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.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D)
node_name: Node name of the host (16 hexadecimal characters)
port_name: Port name of the host (16 hexadecimal characters)

For AMS, WMS, SMS, and AMS2000:

-permhg ctl_no port_no port_name
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.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D, E, F, G, H)
port_name: Port name of the host (16 hexadecimal characters)

-perm ctl_no port_no port_name
Specify the host information to be deleted from that logged in on the specified port.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D, E, F, G, H)
port_name: Port name of the host (16 hexadecimal characters)

-rename ctl_no port_no port_name
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 -newwname option is indispensable.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D, E, F, G, H)
port_name: 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
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 ]

  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 ]
        [ -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 ]
        [ -UAChange                enable | disable ]
```

When specifying simple setting option,
aughopt -unit unnit_name -set ctl_no_port_no
-gno group_no | gname group_name
-platformNotSpecified | HP | Solaris | AIX | Linux |
Windows | VMware | NetWare
-middlewareNotSpecified | VCS | TruCluster

AMS2000
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]
[-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

When specifying per host group option.
auhgopt -unit unit_name –set
[-HostConnection standard | OpenVMS | TRESPASS | WolfPack]
[-HP enable | disable]
[-PSUEReadReject 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]
[-UAChange enalbe | disable]
[-UNMAPShortLength enable | disable]
[-ChangeRespRepli enable | disable]

When specifying the simple setting option:

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

-unit unit_name
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)

-set
Sets the host group options.

-HostConnection ctl_no port_no group_no standard | OpenVMS | TRESPASS | WolfPack
Specify the mode to be emulated.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D, E, F, G, H)
group_no: Host Group number
standard: Open system emulation mode
OpenVMS : Open VMS mode
TRESPASS: TRESPASS mode
WolfPack: WolfPack mode

-SameNodeName ctl_no port_no group_no enable | disable
Specify whether to set the Same Node Name mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D, E, F, G, H).
group_no: Host Group number.
enable : Enables the Same Node Name mode.
disable : Disables the Same Node Name mode.

-TruCluster ctl_no port_no group_no enable | disable
Specify whether to set the Tru Cluster Connection mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D, E, F, G, H).
group_no: Host Group number.
enable : Enables the Tru Cluster Connection mode.
disable : Disables the Tru Cluster Connection mode.

-PIDConv ctl_no port_no group_no enable | disable
Specify whether to set the Port-ID Conversion mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D, E, F, G, H).
group_no: Host Group number.
enable : Enables the Port-ID Conversion mode.
disable : Disables the Port-ID Conversion mode.

-CCHS ctl_no port_no group_no enable | disable
Specify whether to set the CCHS convert mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D, E, F, G, H).
group_no: Host Group number.
enable : Enables the CCHS convert mode.
disable : Disables the CCHS convert mode.

-NACA ctl_no port_no group_no enable | disable
Specify whether to set the NACA mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D, E, F, G, H).
group_no: Host Group number.
enable : Enables the NACA mode.
disable : Disables the NACA mode.

When specifying per option (9500V only)

-pathswAPG ctl_no port_no group_no enable | disable
Specify whether to set the Path Switch mode (Active/Passive Group) effective or ineffective.

ctl_no : Controller number (0, 1).

port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the Path Switch mode (Active/Passive Group).
disable : Disables the Path Switch mode (Active/Passive Group).

-pathswAP ctl_no port_no group_no enable | disable
Specify whether to set the Path Switch mode (Active/Passive) effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the Path Switch mode (Active/Passive).
disable : Disables the Path Switch mode (Active/Passive).

-pathswAA ctl_no port_no group_no enable | disable
Specify whether to set the Path Switch mode (Active/Active) effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the Path Switch mode (Active/Active).
disable : Disables the Path Switch mode (Active/Active).

-NoRSVConf ctl_no port_no group_no enable | disable
Specify whether to set the No_RSV_Conf mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the No_RSV_Conf mode.
disable : Disables the No_RSV_Conf mode.

-ftSRV2 ctl_no port_no group_no enable | disable
Specify whether to set the ftServer Connection mode 2 effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the ftServer Connection mode 2.
disable : Disables the ftServer Connection mode 2.

-SRCReadReject ctl_no port_no group_no enable | disable
Specify whether to set the SRC Read Command Reject mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the SRC Read Command Reject mode.
disable : Disables the SRC Read Command Reject mode.

-HISUP ctl_no port_no group_no enable | disable
Specify whether to set the HISUP mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the HISUP mode.
disable : Disables the HISUP mode.

-HPUX2 ctl_no port_no group_no enable | disable
Specify whether to set the HP connection mode 2 effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the HP connection mode 2.
disable : Disables the HP connection mode 2.

-ProdidDF400 ctl_no port_no group_no enable | disable
Specify whether to set the Product ID DF400 mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the Product ID DF400 mode.
disable : Disables the Product ID DF400 mode.

-SUNCluster ctl_no port_no group_no enable | disable
Specify whether to set the SUN Cluster Connection mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the SUN Cluster Connection mode.
disable : Disables the SUN Cluster Connection mode.

-PRSV ctl_no port_no group_no enable | disable
Specify whether to set the Persistent RSV Cluster mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the Persistent RSV Cluster mode.
disable : Disables the Persistent RSV Cluster mode.

-TargetReset ctl_no port_no group_no enable | disable
Specify whether to set the Target reset mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the Target reset mode.
disable : Disables the Target reset mode.

-Reserve ctl_no port_no group_no enable | disable
Specify whether to set the Reserve mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the Reserve mode.
disable : Disables the Reserve mode.

-LUReset ctl_no port_no group_no enable | disable
Specify whether to set the LU reset mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the LU reset mode.
disable : Disables the LU reset mode.

-TPRLO ctl_no port_no group_no enable | disable
Specify whether to set the Third Party Process Logout mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: 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)

-SPC2 ctl_no port_no group_no enable | disable
Specify whether to set the SPC-2 Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the SPC-2 Mode.
disable : Disables the SPC-2 Mode.

-PIDNoRep ctl_no port_no group_no enable | disable
Specify whether to set the Port-ID No Report mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the Port-ID No Report mode.
disable : Disables the Port-ID No Report mode.

-UASuppress ctl_no port_no group_no enable | disable
Specify whether or not to suppress a unit attention (06/2A00).

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).

group_no: Host Group number.
enable : Suppress the unit attention.
disable : Does not suppress the unit attention.

When specifying per option (For AMS and WMS)

-HISUPOff ctl_no port_no group_no enable | disable
Specify whether to set the HISUP OFF Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the HISUP OFF Mode.
disable : Disables the HISUP OFF Mode.

-ResetPropagation ctl_no port_no group_no enable | disable
Specify whether to set the Reset Propagation Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the Reset Propagation Mode.
disable : Disables the Reset Propagation Mode.

-ASLReportAPG ctl_no port_no group_no enable | disable
Specify whether to set the ASL Report Mode (Active/Passive Group) effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the ASL Report Mode (Active/Passive Group).
disable : Disables the ASL Report Mode (Active/Passive Group).

-ASLReportAP ctl_no port_no group_no enable | disable
Specify whether to set the ASL Report Mode (Active/Passive) effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the ASL Report Mode (Active/Passive).
disable : Disables the ASL Report Mode (Active/Passive).

-ASLReportAA ctl_no port_no group_no enable | disable
Specify whether to set the ASL Report Mode (Active/Active) effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D).
group_no: Host Group number.
enable : Enables the ASL Report Mode (Active/Active).
disable : Disables the ASL Report Mode (Active/Active).

When specifying per option (For AMS, WMS, SMS, and AMS2000)

-HP ctl_no port_no group_no enable | disable
Specify whether to set the HP-UX Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D, E, F, G, H).
group_no: Host Group number.
enable : Enables the HP-UX Mode.
disable : Disables the HP-UX Mode.

-PSUEReadReject ctl_no port_no group_no enable | disable
Specify whether to set the PSUE Read Reject Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D, E, F, G, H).
group_no: Host Group number.
enable : Enables the PSUE Read Reject Mode.
disable : Disables the PSUE Read Reject Mode.

-UniqueReserve1 ctl_no port_no group_no enable | disable
Specify whether to set the Unique Reserve Mode 1 effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D, E, F, G, H).
group_no: Host Group number.
enable : Enables the Unique Reserve Mode 1.

disable : Disables the Unique Reserve Mode 1.

-SerialResponse ctl_no port_no group_no enable | disable
Specify whether to set the Product Serial Response Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D, E, F, G, H).
group_no: Host Group number.
enable : Enables the Product Serial Response Mode.
disable : Disables the Product Serial Response Mode.

-SvolDisableAdvance ctl_no port_no group_no enable | disable
Specify whether to set the S-VOL Disable Advanced Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D, E, F, G, H).
group_no: Host Group number.
enable : Enables the S-VOL Disable Advanced Mode.
disable : Disables the S-VOL Disable Advanced Mode.

When specifying per option (For SMS and AMS2000)

-ModeParamChanged ctl_no port_no group_no enable | disable
Specify whether to set the Mode Parameters Changed Notification Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D, E, F, G, H).
group_no: Host Group number.
enable : Enables the Mode Parameters Changed Notification Mode.
disable : Disables the Mode Parameters Changed Notification Mode.

-TaskIsolation ctl_no port_no group_no enable | disable
Specify whether to set the Task Management Isolation Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D, E, F, G, H).
group_no: Host Group number.
enable : Enables the Task Management Isolation Mode.
disable : Disables the Task Management Isolation Mode.

-InquirySerial ctl_no port_no group_no enable | disable
Specify whether to set the Inquiry Serial Number Conversion Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D, E, F, G, H).
group_no: Host Group number.
enable : Enables the Inquiry Serial Number Conversion Mode.
disable : Disables the Inquiry Serial Number Conversion Mode.

-NOPInSuppress ctl_no port_no group_no enable | disable
Specify whether to set the NOP-In Suppress Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D, E, F, G, H).
group_no: Host Group number.
enable : Enables the NOP-In Suppress Mode.
disable : Disables the NOP-In Suppress Mode.

-DiscoveryCHAP ctl_no port_no group_no enable | disable
Specify whether to set the Discovery CHAP Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D, E, F, G, H).
group_no: Host Group number.
enable : Enables the Discovery CHAP Mode.
disable : Disables the Discovery CHAP Mode.

-UAChange ccl _no port_no group_no enable | disable
Specify whether to set the Unit Retention Change Mode effective or ineffective.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D, E, F, G, H).
group_no : Host Group number.
enable : Enables the Unit Attention Change Mode.
disable : Disables the Unit Attention Change Mode.

When specifying per option (For AMS2000)

-UniqueExtendedCopy ctl_no port_no group_no enable | disable
Specify whether to set the Unique Extended COPY Mode effective or ineffective

ctl_no : Controller number (0, 1),
port_no :Port number (A, B, C, D, E, F, G, H)
group_no : Host Group number
enable : Enables the Unique Extended COPY Mode.
disable : Disables the Unique Extended COPY Mode.

-UniqueWriteSame ctl_no port_no group_no enable | disable
Specify whether to set the Unique Write Same Mode effective or ineffective

ctl_no : Controller number (0, 1),
port_no :Port number (A, B, C, D, E, F, G, H)
group_no : Host Group number
enable : Enables the Unique Write Same Mode.
disable : Disables the Unique Write Same Mode.

-DPDepletionReply ctl_no port_no target_no enable | disable
Specify whether to set the DP Depletion Detail Reply Mode effective or ineffective.

ctl_no : Controller number (0, 1),
port_no :Port number (A, B, E, F)
target_no : Target number
enable : Enables the DP Depletion Detail Reply Mode.
disable : Disables the DP Depletion Detail Reply Mode.

When specifying per host group (For 9500V, AMS, WMS, SMS, and AMS2000)

-set ctl_no port_no
Sets the host group options.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, C, D, E, F, G, H).

-gno group_no
Specify a host group number.

group_no: Host group number.

-gname group_name
Specify a host group name.

group_name: 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))

-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

-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)

-pathswAPG enable | 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)

-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.

-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)

-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.

-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.

When specifying per host group (For SMS and AMS2000)

-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 ineffectiv

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.

-DiscoveryCHAP 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.

-UAChange enable | disable
Specifyt whether to set the Unit Attention Change Mode effective or ineffective.

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 host group (For AMS2000)

-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

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
    DF Depletion Detail Reply Mode = OFF
    Unit Attention Change Mode = OFF
    UNMAP Short Length Mode = OFF
    Change Response for Replication 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
 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
 auhgmap  -unit unit_name -availablelist ctl_no port_no
       -gno group_no | -gname group_name -hlu | -lu
```

Description

This command sets mapping information.

Options

-unit unit_name
: 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 ctl_no port_no
: 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

-add ctl_no port_no group_no hlu lu
Adds the mapping information.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D, E, F, G, H)
group_no: Host Group number
hlu : LU number recognized by the host
lu : LU number of the array unit

-chg ctl_no port_no group_no hlu lu
Changes the mapping information.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D, E, F, G, H)
group_no: Host Group number
hlu : LU number recognized by the host
lu : LU number of the array unit

-rm ctl_no port_no group_no hlu lu
Deletes the mapping information.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D, E, F, G, H)
group_no: Host Group number
hlu : LU number recognized by the host
lu : LU number of the array unit

When specifying host group number or host group name

-add ctl_no port_no
Adds the mapping information.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D, E, F, G, H)

-chg ctl_no port_no
Changes the mapping information.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D, E, F, G, H)

-rm ctl_no port_no
Deletes the mapping information.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, C, D, E, F, G, H)

-gno group_no
Specify a host group number.

group_no: Host group number

-gname group_name
Specify a host group name.

group_name: 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 hlu
Specify a LUN to be recognized by a host.

-lu lu
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
  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

-unit unit_name
: 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 "- (minus)", "_ (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 ctl_no port_no

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.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, C, D, E, F, G, H)

-chg ctl_no port_no

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.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, C, D, E, F, G, H)

-rm ctl_no port_no

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.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, C, D, E, F, G, H)

-init ctl_no port_no

Initializes the Host Group 0 of the specified port.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, C, D, E, F, G, H)

-gno group_no ...

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 group_name ...

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 group_name

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

-unit unit_name
Specify the name of an array unit whose host group information are to be output into the file.
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.

-file file_name
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

-unit unit_name
Specify the name of the array unit to be set with the host group information for the file.
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.

-file file_name
Specify the name of the file (path) to input 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 mapping information.

-wwn
Specify when setting up the host information.

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 th
e 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 3-209
- Referencing/setting the initiator information on page 3-212
- Referencing/setting iSCSI target options on page 3-215
- Referencing/setting iSCSI target mapping information on page 3-226

Referencing/setting iSCSI target information

Command name

```
autargetdef
```

Format

```
AMS, WMS, SMS, AMS2000
  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

-unit unit_name
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 "- (minus)", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.

-refer
References the target information.

-add ctl_no port_no
Adds the target information.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-chg ctl_no port_no
Changes the target information.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-rm ctl_no port_no
Deletes the target information.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-init ctl_no port_no
Initializes the Target 0.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-tno target_no
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.

target_no: Target number

-tno target_no ...
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

target_no: Target number

-talias target_alias
Specify the target alias.
Space in front and in the rear of the character string is removed.
Cannot specify spaces only.

target_alias: Target alias (See Note 1)

-talias target_alias ...
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

target_alias: Target alias (See Note 1)

-iname target_iscsi_name
Specify the target iSCSI name.

target_iscsi_name: Target iSCSI name (See Note 2)

-inamefile file_name
Specify the file (path) name when setting the target iSCSI name using a file.

file_name: 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 target_user_name
Specify the target user name.
Space in front and in the rear of the character string is removed.
Cannot specify spaces only.

target_user_name: Target user name (See Note 3)

-tuserfile file_name
Specify the file (path) name when setting the target user name using a file.

file_name: File (path) name

-newtalias target_alias
Specify the target alias to be changed.
Space in front and in the rear of the character string is removed.
Cannot specify spaces only.

target_alias: 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
  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:
    autarget.ini -unit unit name -add-ctl_no port_no
       [-tno target_no | -talias target_alias
       [-iname initiator_iscsi_name | -inamefile file_name
       [-ininame initiiator_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

-unit unit_name
Specify the name of the array unit for which to reference or set the initiator 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.

-refer [ctl_no port_no]
References the initiator information.
The initiator information list is sorted by the iSCSI name.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-set ctl_no port_no
Sets the target security.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-add ctl_no port_no
Sets the initiator information.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-chg ctl_no port_no
Changes the initiator information.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-rm ctl_no port_no
Deletes the initiator information.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-availablelist ctl_no port_no
Displays the eligible initiator information.

ctl_no : Controller number (0, 1)
port_no: Port number (A, B, E, F)

-tno target_no
Specify the target number.

target_no: Target number

-talias target_alias
Specify the target alias.
Space in front and in the rear of the character string is removed.
Cannot specify spaces only.

target_alias: Target alias (See Note 1)

-login
Specify this option when displaying initiator information that is logged in on the specified port.

-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.

iscsi_name: iSCSI name (See Note 2)

-inamefile file_name
Specify the file (path) name when setting the initiator iSCSI name using a file.

file_name: File (path) name

-ininame initiator_nickname
Specify the initiator name (Nickname).
Space in front and in the rear of the character string is removed.
Cannot specify spaces only.

initiator_nickname: initiator name (See Note 3)

-newiname new_initiator_iscsi_nickname
Specify the initiator iSCSI name to be changed.

new_initiator_iscsi_name: initiator iSCSI name (See Note 2)

-newinamefile file_name
Specify the file (path) name when changing the initator iSCSI name using a file.

file_name: File (path) name

-newininame new_initiator_nickname
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.

new_initiator_nickname: 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
 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
                  -tno target_no | -talias 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 ]
               [ -PSUEReadReject   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 ]
                [ -UAChange         enable | disable

  When specifying per target.
    autargetopt  -unit unit_name -set ctl_no port_no
                  -tno target_no | -talias target_alias
                [ -HostConnection   standard | OpenVMS | TRESPASS | WolfPack ]
                [ -HP               enable | disable ]
                [ -PSUEReadReject   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 ]
                [ -UAChange         enable | disable ]

autargetopt  -unit unit_name -set ctl_no port_no
                -tno target_no | -talias target_alias
                -platform   NotSpecified | HP | Solaris | AIX | Linux |
                            Windows | VMware | NetWare
                -middleware NotSpecified | VCS | TruCluster


AMS2000
  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 ]
               [ -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 ]
               [ -UNMAPShortLength  ctl_no port_no target_no enable | disable ]
               [ -ChangeRespRepli  ctl_no port_no target_no enable | disable ]

When specifying per target.
    autargetopt  -unit unit_name –set ctl no port no
                -tno target no }-talias target alias
               [ -HostConnection   ctl_no port_no target_no
                                    standard | OpenVMS | TRESPASS | WolfPack ]
               [ -HP enable | disable ]
               [ -PSUEReadReject 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]


When specifying simple setting option
    autargetopt  -unit unit_name -set ctl_no port_no
                 -tno target_no | -talias 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

-unit unit_name
Specify the name of the array unit in which the target 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 target options.

When specifying per option (For AMS, WMS, SMS, and AMS2000)

-set
Sets the target options.

-HostConnection ctl_no port_no target_no standard | OpenVMS | TRESPASS | WolfPack
Specify the mode to be emulated.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, E, F)
target_no: Target number
standard : Open system emulation mode
OpenVMS : Open VMS mode
TRESPASS : TRESPASS mode
WolfPack : WolfPack mode

-HP ctl_no port_no target_no enable | disable
Specify whether to set the HP-UX Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: Target number.
enable : Enables the HP-UX Mode.
disable : Disables the HP-UX Mode.

-PSUEReadReject ctl_no port_no target_no enable | disable
Specify whether to set the PSUE Read Reject Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: Target number.
enable : Enables the PSUE Read Reject Mode.
disable : Disables the PSUE Read Reject Mode.

-NACA ctl_no port_no target_no enable | disable
Specify whether to set the NACA mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: Target number.
enable : Enables the NACA Mode.
disable : Disables the NACA Mode.

-UniqueReserve1 ctl_no port_no target_no enable | disable
Specify whether to set the Unique Reserve Mode 1 effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: Target number.
enable : Enables the Unique Reserve Mode 1.
disable : Disables the Unique Reserve Mode 1.

-PIDConv ctl_no port_no target_no enable | disable
Specify whether to set the Port-ID Conversion mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: Target number.
enable : Enables the Port-ID Conversion mode.
disable : Disables the Port-ID Conversion mode.

-TruCluster ctl_no port_no target_no enable | disable
Specify whether to set the Tru Cluster Connection mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: Target number.
enable : Enables the Tru Cluster Connection mode.
disable : Disables the Tru Cluster Connection mode.

-SerialResponse ctl_no port_no target_no enable | disable
Specify whether to set the Product Serial Response Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: Target number.
enable : Enables the Product Serial Response Mode.
disable : Disables the Product Serial Response Mode.

-SameNodeName ctl_no port_no target_no enable | disable
Specify whether to set the Same Node Name mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: Target number.
enable : Enables the Same Node Name mode.
disable : Disables the Same Node Name mode.

-CCHS ctl_no port_no target_no enable | disable
Specify whether to set the CCHS convert mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: Target number.
enable : Enables the CCHS convert mode.
disable : Disables the CCHS convert mode.

-SvolDisableAdvance ctl_no port_no target_no enable | disable
Specify whether to set the S-VOL Disable Advanced Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: Target number.
enable : Enables the S-VOL Disable Advanced Mode.
disable : Disables the S-VOL Disable Advanced Mode.

When specifying per option (For AMS and WMS)

-UASuppress ctl_no port_no target_no enable | disable
Specify whether or not to suppress a unit attention (06/2A00).

ctl_no : Controller number (0, 1).
port_no : Port number (A, B).
target_no: Target number.
enable : Suppress the unit attention.

disable : Does not suppress the unit attention.

-HISUPOff ctl_no port_no target_no enable | disable
Specify whether to set the HISUP OFF Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B).
target_no: Target number.
enable : Enables the HISUP OFF Mode.
disable : Disables the HISUP OFF Mode.

-ResetPropagation ctl_no port_no target_no enable | disable
Specify whether to set the Reset Propagation Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B).
target_no: Target number.
enable : Enables the Reset Propagation Mode.
disable : Disables the Reset Propagation Mode.

-ASLReportAPG ctl_no port_no target_no enable | disable
Specify whether to set the ASL Report Mode (Active/Passive Group) effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B).
target_no: Target number.
enable : Enables the ASL Report Mode (Active/Passive Group).
disable : Disables the ASL Report Mode (Active/Passive Group).

-ASLReportAP ctl_no port_no target_no enable | disable
Specify whether to set the ASL Report Mode (Active/Passive) effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B).
target_no: Target number.
enable : Enables the ASL Report Mode (Active/Passive).
disable : Disables the ASL Report Mode (Active/Passive).

-ASLReportAA ctl_no port_no target_no enable | disable
Specify whether to set the ASL Report Mode (Active/Active) effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B).
target_no: Target number.
enable : Enables the ASL Report Mode (Active/Active).
disable : Disables the ASL Report Mode (Active/Active).

-PIDNoRep ctl_no port_no target_no enable | disable
Specify whether to set the Port-ID No Report mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B).
target_no: Target number.
enable : Enables the Port-ID No Report mode.
disable : Disables the Port-ID No Report mode.

-SPC2 ctl_no port_no target_no enable | disable
Specify whether to set the SPC-2 Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B).
target_no: Target number.
enable : Enables the SPC-2 Mode.
disable : Disables the SPC-2 Mode.

When specifying per option (For SMS and AMS2000)

-ModeParamChanged ctl_no port_no target_no enable | disable
Specify whether to set the Mode Parameters Changed Notification Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: Target number.
enable : Enables the Mode Parameters Changed Notification Mode.
disable : Disables the Mode Parameters Changed Notification Mode.

-TaskIsolation ctl_no port_no target_no enable | disable
Specify whether to set the Task Management Isolation Mode effective or

ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: Target number.
enable : Enables the Task Management Isolation Mode.
disable : Disables the Task Management Isolation Mode.

-InquirySerial ctl_no port_no target_no enable | disable
Specify whether to set the Inquiry Serial Number Conversion Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: Target number.
enable : Enables the Inquiry Serial Number Conversion Mode.
disable : Disables the Inquiry Serial Number Conversion Mode.

-NOPInSuppress ctl_no port_no target_no enable | disable
Specify whether to set the NOP-In Suppress Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: Target number.
enable : Enables the NOP-In Suppress Mode.
disable : Disables the NOP-In Suppress Mode.

-DiscoveryCHAP tl_no_port_no target no enable | disable
Specify whether to set the Discovery CHAP Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: 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

When specifying per target (For AMS2000 only)

-UniqueExtendedCOPY ctl_no port_no target no enable | disable
Specify whether to set the Unique Extended COPY Momde effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: Target number.
enable : Enables the Unique Extended COPY Mode.
disable : Disables the Unique Extended COPY Mode.

-UniqueWriteSame ctl_no port_no target_no enable | disable
Specify whether to set the Unique Write Same Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: Target number.
enable : Enables the Unique Write Same Mode.
disable : Disables the Unique Write Same Mode.

-set ctl_no port_no
Sets the target options.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).

-tno target_no

Specify the target number.

target_no: Target number

-talias target_alias
Specify the target alias.
Space in front and in the rear of the character string is removed.
Cannot specify spaces only.

target_alias: 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.

-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 CCHS convert mode effective or ineffective.

enable : Enables the CCHS convert mode.
disable : Disables the CCHS convert 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.

When specifying per target (For AMS and WMS)

-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.

When specifying per target (For SMS and AMS2000)

-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 ctl_no port no target_no enable | disable
Specify whether to set the Report (iSCSI Full Portal List Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
target_no: Traget number.
enable : Enables the Report iSCSI Full Portal List Mode.
disable : Disables the Report iSCSI Full Portal List Mode.

-UAChange ctl_no port_no group_no enable | disable
Specify whether to set the Unit Attention Change Mode effective or ineffective.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).
group_no: Host group number.
enable : Enables the Unit Attention Change Mode.
disable : Disables the Unit Attention Change Mode.

When specifying per target (AMS2000 only)

-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.

When specifying per target (For AMS, WMS, SMS and AMS2000)
-set ctl_no port_no
Sets the target options.

ctl_no : Controller number (0, 1).
port_no : Port number (A, B, E, F).

-tno target_no
Specify the target number.

target_no: Target number

-talias target_alias
Specify the target alias.
Space in front and in the rear of the character string is removed.
Cannot specify spaces only.

target_alias: 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.

-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.

-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.

-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.

When specifying per target (For AMS and WMS)

-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.

-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 optoin can also be specified at the same time.

Example

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

```
% autargetopt -unit ams2300 -refer
Port 0A, Target 000:TARGET000
Platform = Windows
Middleware = Tru Cluster
Host Connection Mode 1 = Standard Mode
Host Connection Mode 2
HP-UX Mode = OFF
PSUE Read Reject Mode = OFF
Mode Parameters Changed Notification Mode = OFF
NACA Mode = OFF
Task Management Isolation Mode = OFF
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
Report iSCSI Full Portal List Mode = OFF
DP Depletion Detail Reply Mode = OFF
Unit Attention Change Mode = OFF
UNMAP Short Length Mode = OFF%
Change Response for Replication Mode = OFF
```

Referencing/setting iSCSI target mapping information

Command name

```
autargetmap
```

Format

```
AMS, WMS, SMS, AMS2000
  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

-unit unit_name
Specify the name of the 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 ctl_no port_no
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.

ctl_no : Controller number (0, 1)
port_no : 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 ctl_no port_no target_no hlu lu
Adds the mapping information.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, E, F)
target_no: Target number
hlu : LU number recognized by the host
lu : LU number of the array unit

-chg ctl_no port_no target_no hlu lu
Changes the mapping information.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, E, F)
target_no: Target number
hlu : LU number recognized by the host
lu : LU number of the array unit

-rm ctl_no port_no target_no hlu lu
Deletes the mapping information.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, E, F)
target_no: Target number
hlu : LU number recognized by the host
lu : LU number of the array unit

When specifying target number or target alias

-add ctl_no port_no
Adds the mapping information.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, E, F)

-chg ctl_no port_no
Changes the mapping information.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, E, F)

-rm ctl_no port_no
Deletes the mapping information.

ctl_no : Controller number (0, 1)
port_no : Port number (A, B, E, F)

-tno target_no
Specify the target number.

target_no: Target number

-talias target_alias
Specify the target alias.
Space in front and in the rear of the character string is removed.
Cannot specify spaces only.

target_alias: Target alias (See Note 1)

-hlu hlu
Specify a LUN to be recognized by a host.

-lu lu
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 3-230
- Displaying/setting NAS system LU on page 3-232
- Referencing/setting NAS user LU on page 3-235
- Referencing/shutdown/booting/rebooting NNC on page 3-237

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.

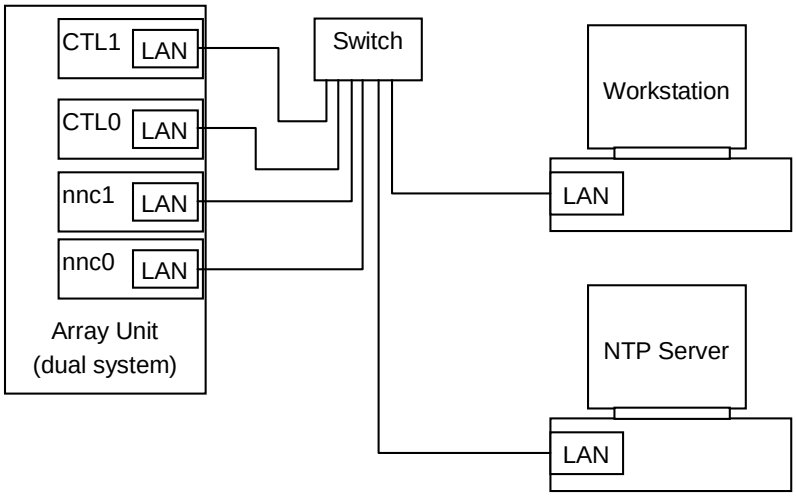


Figure 3-10: Example of Host Computer Connection

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

-unit unit_name
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 "- (minus)", "_ (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 nnc_no
Specify the NNC number.

-addr inet_addr
Specify the IP addresses.

-mask netmask
Specify the subnet masks.

-mtu num
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.

```
% aunnclan -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.

```
% aunnclan -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 LU

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

-unit unit_name
: 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 "- (minus)", "_ (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 nnc_no
: Specify the NNC numbers separating them with a slash (/).
Example: -nnc 0/2

-sys0 lun
Specify an LU number to be assigned to the system disk(CTL0).

-sys1 lun
Specify an LU number to be assigned to the system disk(CTL1).

-dump0 lun
Specify an LU number to be assigned to the volume(CTL0) for storing a dump.

-dump1 lun
Specify an LU number to be assigned to the volume(CTL1) for storing a dump.

-cmddev lun
Specify an LU number to be assigned to the command device.

-cmddev2 lun
Specify an LU number to be assigned to the command device (Secondary).

-dumpwk lun
Specify an LU number to be assigned to the work area for storing a result of the dump edition.

-syscom lun
Specify an LU number to be assigned to the common volume of the NAS system.

-backup lun
Specify an LU number to be assigned to a volume for backing up the common volume.

-backup2 lun
Specify an LU number to 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.

-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 LU

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

-unit unit_name
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 "- (minus)", "_ (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 nnc_no hlu lu
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.

nnc_no: Specify the NNC numbers separating them with a slash (/).
Example: -nnc 0/2
hlu : Specify a LUN to be recognized by a host.
lu : Specify an internal LUN of the disk array subsystem.

-nnc nnc_no
Specify the NNC numbers.

nnc_no: 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

aunnc

Format

```
AMS, WMS
  aunnc  -unit unit_name –refer

  aunnc  -unit unit_name -shutdown -nnc nnc_no

  aunnc  -unit unit_name -boot -nnc nnc_no

  aunnc  -unit unit_name -reboot -nnc nnc_no
```

Description

This command references the status of the NNC or Shutdown/Booting/ Rebooting the NNC.

Options

-unit unit_name
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 nnc_no
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 3-16: 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 stars 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 3-241
- Monitoring errors on page 3-242
- Referencing/setting the monitoring error options on page 3-247

Setting the starting of the application

Command name

```
auextprog
```

Format

```
9500V, AMS, WMS, SMS, AMS2000
  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

-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
  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 Ctl + 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.

Options

-time uptime
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.

-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 thesecond 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
t he 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.

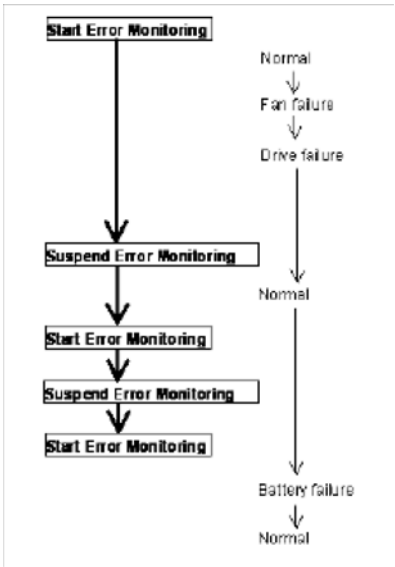
```
% auerroralert  -time 1
Mon, May 01 10:10:00 2002 Executing.
Mon, May 01 10:30:00 2002 /9500a1/ARRAY Battery Alarm.
Mon, May 01 10:40:00 2002 Executing.
```

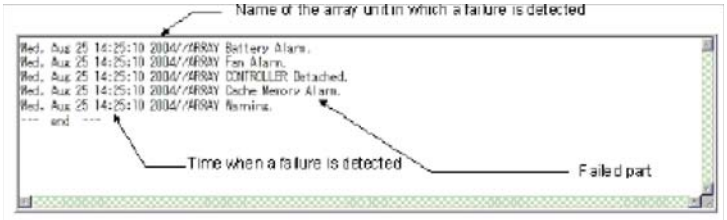
When a failure is detected in the array and error monitoring is executed, the function outputs the failure information to a log file.

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

Mon: Month

dd: Date

hh:mm:ss: Hours, minutes, and seconds

yyyy: Year

The following table details message text and meaning for the AMS 2000.

Table 3-17: Message Text and Meaning (AMS2000)

No.	Message text	Meaning of message	Errlog.txt Output	Event	
				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	
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	
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	Error/ 1800
18	ARRAY Interface Board Alarm. Position CONTROLLER No.X Interface Board No.Y.	An interface board blockade occurred.	O	O	Error/ 1100
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

Table 3-17: Message Text and Meaning (AMS2000)

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 3-18: 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 detials message text and meaning for the AMS/WMS.

Table 3-19: 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.)
3	ARRAY SATA Drive Detached. ARRAY Detached SATA Drive Position Unit No.X HDU No.Y.	An 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 partical blockade occurred.

The following table details message text and meaning for the 9500V.

Table 3-20: Message Texts 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.	An 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.
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
  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

-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 user_id
Specify the user ID.

user_id: User ID (See Note 1)

-uidfile file_name
Specify the file(path) name when setting the user ID using a file.

file_name: File (path) name

-askuid
Specify this option when inputting the user ID for a request.

-passwdfile file_name
Specify the file(path) name when setting the password using a file.

file_name: File (path) name

-unit unit_name
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 "- (minus)", "_ (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 3-250
- Referencing/setting LU tuning parameters on page 3-253
- Referencing/setting prefetch tuning parameters on page 3-254
- Referencing/setting multi-stream tuning parameters on page 3-256
- Referencing/setting LU ownership tuning parameters on page 3-258
- Setting/deleting the account information for scripts on page 3-259

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
```

Description

This command refers to or sets the system tuning parameters.

Options

-unit unit_name
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 "- (minus)", "_ (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 num
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 num
Specify an occasion to de-stage dirty data. (0 to 50)

-dtystop num
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 num
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

-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 invalidatethe 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.i

Note: Validation or invalidation of the Multiple Stream Mode is set with the online system parameter (auonsysprm) or the system parameter (ausysparam). (DF600)

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
%
```

Referencing/setting LU tuning parameters

Command name

```
aulutuning
```

Format

```
9500V
  aulutuning  -unit unit_name –refer

  aulutuning  -unit unit_name -set -lu lun ...
              -pfdata disable | num

  aulutuning  -unit unit_name -default [ -lu lun ]
```

Description

This command refers to or sets the LU tuning parameters.

Options

-unit unit_name
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 lun ...
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

-pfdata disable | num
Specify the time to start the pre-fetch.

disable: The pre-fetch is not started.
num : 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.

```
% aulutuning  -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

-unit unit_name
: 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 "- (minus)", "_ (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 num
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.

-size num
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 lun ...
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 num
Specify the fixed size of pre-fetched data (1 to 65535 [KB]).

-basesize num
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
  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
  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
  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

-unit unit_name
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 "- (minus)", "_ (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 lun ...
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.

            enable : Enables the specification of the read/write mode.
            disable: Disables the specification of the read/write mode.

-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 num
       Specify the decided sequential number (0 to 10).

-fixedsize num
       Specify the fixed size of pre-fetched data (1 to 65535 [KB]).

-basesize num
       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 LU ownership tuning parameters

Command name

```
autuningluown
```

Format

```
SMS, AMS2000
 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

```
-unit unit_name
        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 "- (minus)", "_ (underline)", ". (period)",
        "@",or "  (space)". Space in front and in the rear of the character string
        is removed.
-refer
        References the LU ownership tuning parameters.
-set
        Sets the LU ownership tuning parameters.

-lu lun ...
        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 ption 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
  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

-set
Sets the account information.

-rm
Deletes the account information.

-test
Tests the account information.

-uid user_id
Specify the user ID.

user_id: User ID (See Note 1)

-uidfile file_name
Specify the file(path) name when setting the user ID using a file.

file_name: file (path) name

-askuid
Specify this option when inputting the user ID for a request.

-passwdfile file_name
Specify the file (path) name when setting the password using a file.

file_name: file (path) name

-authentication
Tests the account informatoin for the registered array unit.

-unit unit_name
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 sms1000a1
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 3-263
- Outputting performance information file on page 3-264
- Referencing/setting the collection state of performance statistics on page 3-285
- Downloading/updating firmware on page 3-287

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

-unit unit_name
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 "- (minus)", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.

-memory | -drive
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
             Reads       Writes      Sequential  Sequential  Prefetch  Write Through
  CTL     LU  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
 auperform  -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 ]


 auperform  -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, AMS2000
  auperform  -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 ]

   auperform  -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 ]


AMS2000
 auperform –unit unit_name –manual –pfmstatis
        [ -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 ]



auperform –unit unit name –auto time –pfmstatis
        [ -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 ]
```

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 -pfmstatis 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 -pfmstatis 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 scond (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 Rand 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)

The output file names are as follows:

When the -pfmstatis 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 -pfmstatis 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: If the –pfmstatis option is specified, the entire information is output to files once, the size of the output data is the data size described here. 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.

Options

-unit unit_name
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 "- (minus)", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.

-manual
Acquires the performance information manually.

-auto time
Automatically acquires the performance information at specified interval of time (1 to 1439 minutes).

-count n
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 path_name
Specify the directory in which the performance information is to be acquired. If omitted, the information is outputted into the current directory.

-pfmstatis
Specify this option when outputting the performance statistics information.

9500V only:

-lu lun ...
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.

-rginfo [rg_no ...]
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 [lun ...]
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 [unit_no.hdu_no ...]
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

-driveoprinfo [unit_no.hdu_no ...]
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 [path_no.loop_no ...]
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:

-portinfo ctl_no [port_no ...]
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.

ctl_no : Controller number (0, 1)

-rginfo ctl_no [rg_no ...]
When outputting performance statistics information of RAID group, specify the RAID group number to be output.

ctl_no : 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 nformation 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 ctl_no [lun ...]
When outputting performance statistics information of logical unit, specify the logical unit number to be output.

ctl_no : 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 1 2 3 4 5 8
-luinfo 0 0-5 8

-cacheinfo ctl_no
Specify this option when outputting the performance statistics information of cache.

ctl_no : Controller number (0, 1)

-processorinfo ctl_no
Specify this option when outputting the performance statistics information of

processor.

ctl_no : Controller number (0, 1)

-driveinfo ctl_no [unit_no.hdu_no ...]
When outputting statistical information on the drive performance, specify the Unit number and HDU number punctuating them with a period.

ctl_no : 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 ctl_no [unit_no.hdu_no ...]
When outputting statistical information on the drive operation performance, specify the Unit number and HDU number punctuating them with a period.

ctl_no : 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:

-backendinfo ctl_no [path_no.loop_no ...]
When outputting statistical information on the back-end performance, specify the path number and loop number punctuating them with a period.

ctl_no : 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

For SMS and AMS2000:

-backendinfo ctl_no [path_no ...]
When outputting statistical information on the back-end performance, specify the path number.

ctl_no : Controller number (0, 1)

When doing that, enter the path number using numerals or hyphen(s) (-).
If the specification of path number is omitted, the information about all the back-end is output.
Single or multiple path numbers can be specified.

Single specification : Specifying a single path number.
Example: -backendinfo 0 1
Multiple specification: Specifying multiple path numbers.
Example: -backendinfo 0 0 1
-backendinfo 0 0-1

For AMS2000:

-dppoolinfo ctl_no [pool_no ...]
When outputting performance statistics information of DP pool,specify the DP pool number to be output.

ctl_no : Controller number (0, 1)

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



NOTE: 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.)



NOTE: If the information cannot be acquired in the interval time by the -auto specification, “skipped” ouputs for the file acquired in the time and the file which could not be acquired in the interval time.

```
No. 1
2012/11/20 13:01:00 skipped. - SN:85012345
```

If a communication error has occurred by the -neterrorskip specification, an error message “error skipped,” outputs for the file acquired in the time.

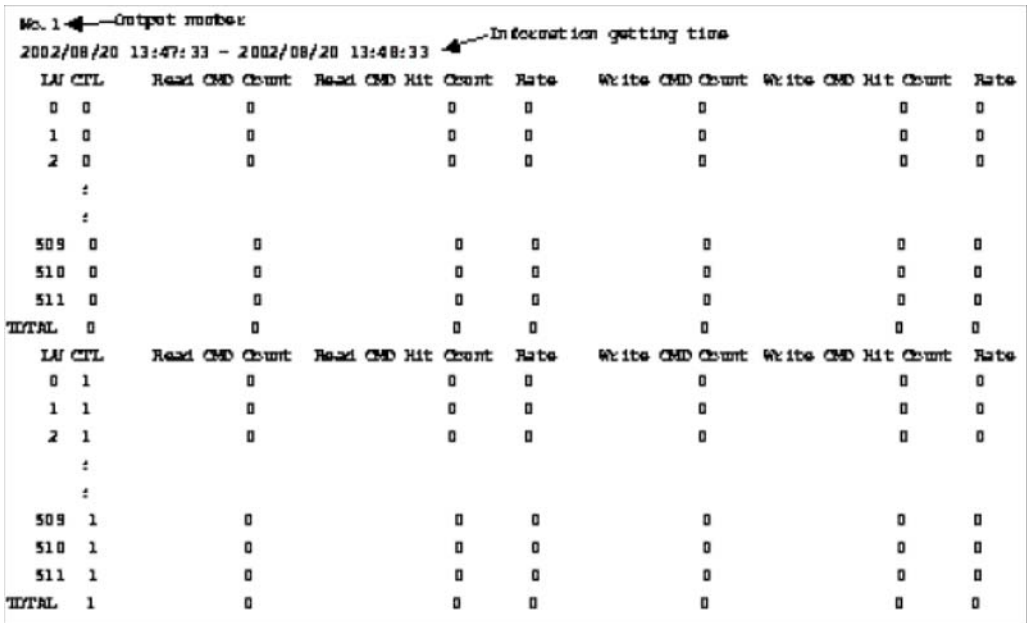
```
No. 1
2012/11/20 13:01:00 error skipped. - SN:85012345
error message
```

Example

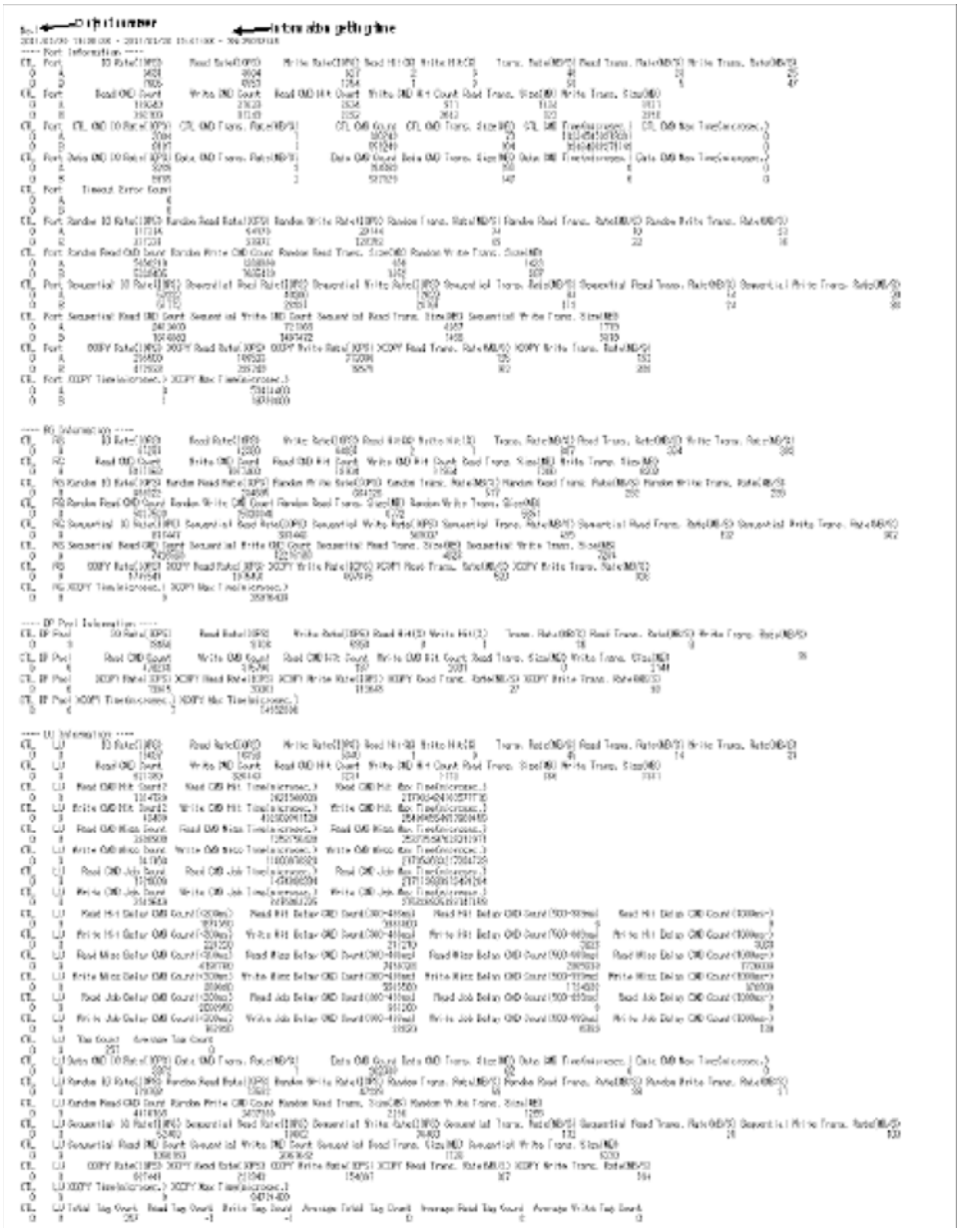
The following example acquires the performance information of an array ams500a1 only once at an interval of 10 minutes.

```
% auperform  -unit ams500a1  -auto 10 –count 1 –pfmstatis
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.:** 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



*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.

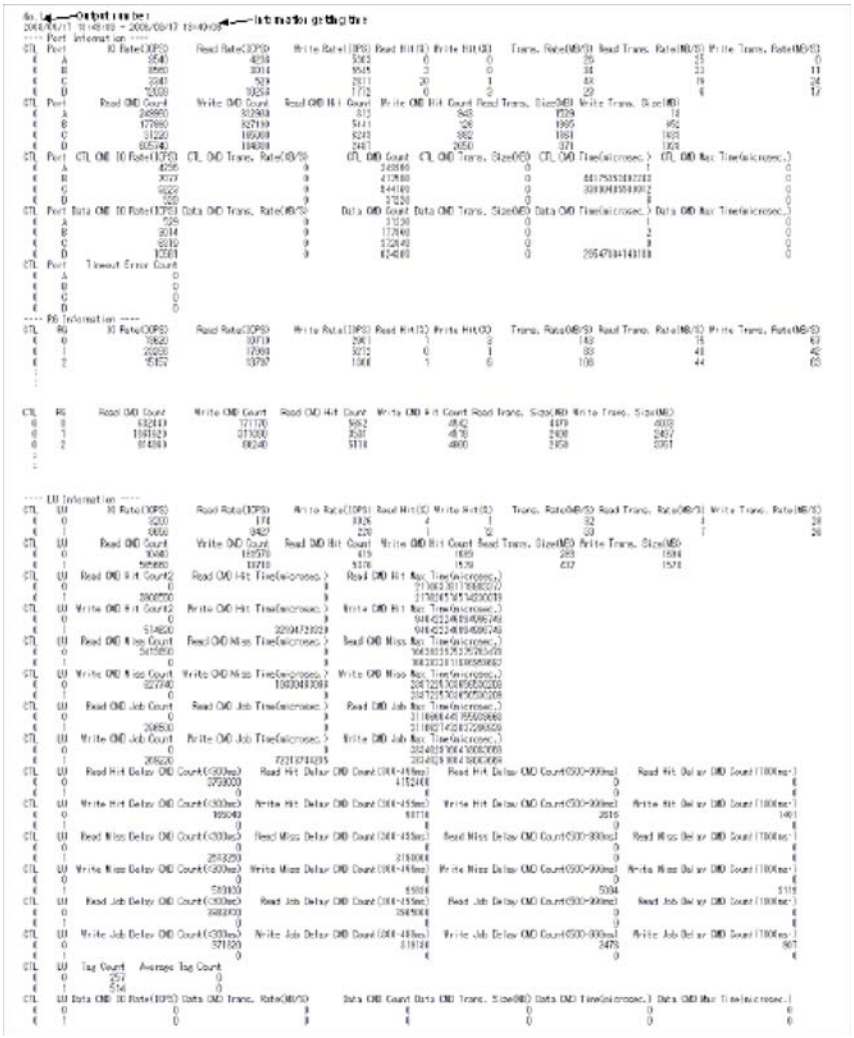
```
--- Cache Information ----
TL Write Pending Rate(%)
 0                     0
TL Clean Queue Usage Rate(%) Middle Queue Usage Rate(%) Physical Queue Usage Rate(%) Total Queue Usage Rate(%)
 0                         0                          0                           0                         0
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
 0         1                         0                          0                           0
 0         2                         0                          0                           0
 :
 :
 0        31                         0                          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                               0
TL Cache(DRR) Bus Usage Rate(%)        Dual Bus Usage Rate(%)          Total Bus Usage Rate(%)
 0                            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                4091                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                         0
 0    1                  0                   0                   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.:** 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

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
  aupfmstatiscfg  -unit unit_name –refer

  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 ]
```

Description

This command refers to or sets the collection state of performance statistics information.

Options

-unit unit_name
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.

-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.
%
```

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
  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

-unit unit_name
: 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 "- (minus)", "_ (underline)", ". (period)", "@", or " (space)". Space in front and in the rear of the character string is removed.

-read
: Reads a firmware onto the Navigator.

-path disk01 disk02 disk03 ...
Specify sequentially the path names to individual directories in which each file of a firmware to be downloaded is stored.

-fpath disk01
Specify the path name of the directory which stored a disk 01 file of firmware to download.

-fpath micro_path
Specify the path name of the directory which stored a file of firmware to download.

-revision
Displays the revision of a firmware which has been read onto the Navigator.

-download
Downloads a firmware into an array unit.

-time time
Specify the time interval (0 to 60 seconds) at which to download a firmware.
When the -auto option is specified:
If the specification is omitted, the interval time is 3 seconds.

-check on | off
Specify whether or not to check the revision of a firmware.
When the -auto option is specified:
If the specification is omitted, checking the revision.

-downloadrev
Displays the revision of a firmware which has been downloaded into an array unit.

-change
Updates a firmware.

-ctl0 | -ctl1
Specify the controller whose firmware is to be updated.

-clean
Deletes the firmware which has been read onto the Navigator.

-auto
Reads, download and update a firmware.

-cpuloadchk on | off
Specify whether to check the CPU loading or not.
When the -auto or -change 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  Resconstruction Progress
0      6 (9D+2P 1             SAS  1.3 TB            1.3 TB (100%)RAID Group Expansion    NormalN/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
                    Stripe   RAID    DP    RAID
  LU      Capacity    Size    Group    Pool  Level        Type  Status
 100         1.0 GB    256KB      0     N/A    6( 9D+2P)  SAS   Normal

%
```

Appendix A — 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
- Enabling/disabling
- Modifying the account information
- Audit Logging
- Cache Partition
- Cache Residency Manager
- Data Retention Utility
- LUN Manager (Fibre Channel)
- Modular Volume Migration
- SNMP Agent Support Function

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.

```
% auopt -unit disk array-name –refer
The Account Authentication is enabled. Please login.
User ID: root
Password:
```

```
Option NameType      Term     Status
ACCOUNTPermanent ---      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
3. 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 auaccount 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. Un
authorized access or use of this computer system may subject violators to cri
minal, civil, and/or administrative action.

All information on this computer system may be intercepted, recorded, read, c
opied, and disclosed by and to authorized personnel for official purposes, in
cluding criminal investigations. Such information includes sensitive data enc
rypted to comply with confidentiality and privacy requirements. Access or use
 of this computer system by any person, whether authorized or unauthorized, c
onstitutes consent to these terms. There is no right of privacy in this syste
m.
%
```

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
%
```

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 Acccount 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
```

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 ouput 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

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 –srv1addr
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

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_81000026.txt.
Do you want to continue processing? (y/n [n]): y
The export of internal log may affect the host access. In some cases,
performanc
e 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

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.
%
```

Miscellaneious Audit Logging Feature Information

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:

```
14 Nov 22 11:10:42 192.168.100.10 Storage: CELFSS,1,123456,,2005-11-22T11:10:40.0+09：00,Storage,
 1        2             3          4       5   6  7              9                10

192.168.100.10,Authentication,Success,uid=Hitachi_storage_admin,DF800:850012345,,,,,,
      11             12         13              14                   15

from=192.168.100.200,,to=192.168.100.10,2000,,,,3EB70100 Account User Login
          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 1st.
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 wil 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 "2005-12-26T: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 (DF800) 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.

Table A-2: Audit Log Entry Details

Code	Message	Explanation
31000100	Create LU[*1] AssignedSize=*2Blocks Type=*3 AcceleratedWideStripingMode=*4 FullCapacityMode=*5	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]
31000200	Delete LU[*1] Type=*2	Deleting a logical unit *1 LU number *2 Type [RG|DP]
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]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
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
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
3600010000	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
3E030100	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
3E060100	Set SNMP Information	Setting the SNMP information
3E0C0100	Login (Password Protection)	Logged in with Password Protection user ID
3E0C0200	Logout (Password Protection)	Log out already logged in with Password Protection user ID
3E0C0300	Reset UserID (Password Protection)	Clearing logged in status with Password Protection user ID
3E0C0400	Register UserID (Password Protection)	Registering a Password Protection user ID
3E0C0500	Delete UserID (Password Protection)	Deleting the Password Protection user ID
3E110100	Set Spare Drives: Unit[*1] HDU[*2]	Setting the spare drives *1 Unit number *2 HDU number
3E110200	Release Spare Drives: Unit[*1] HDU[*2]	Releasing the spare drives *1 Unit number *2 HDU number
3E130100	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	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]
3E1B0200	Create Local Pair: CopyType=SnapShot PairName=*1 P-VOL=*2 S-VOL=*3 GroupNumber=*4 DataPool=*5 CopyPace=*6	SnapShot pair creating (***Note*** 3) *1 Pair name *2 P-VOL number *3 S-VOL number *4 CTG number *5 Pool number *6 Copy pace [Fast|Medium|Slow]
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]
3E1B0400	Create Remote Pair: CopyType=TrueCopyExtendedDistance PairName=*1 P-VOL=*2 S-VOL=*3 RemoteArraySerialNumber=*4 GroupNumber=*5 LocalDataPool=*6 RemoteDataPool=*7 CopyPace=*8 Mode=*9	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 data pool number *7 Remote data pool number *8 Copy pace [Fast|Medium|Slow] *9 Copy mode [CopySkip|InitialCopy]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
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]
3E1B0600	*1: CopyType=SnapShot P-VOL=*2 S-VOL=*3 GroupNumber=*4 CopyPace=*5	SnapShot 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]
3E1B0700	*1: CopyType=TrueCopy P-VOL=*2 S-VOL=*3 RemoteArraySerialNumber=*4 GroupNumber=*5 CopyPace=*6 SyncCTGMode=*7	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 CTG number *6 Copy pace [Fast|Medium|Slow] *7 Sync CTG mode [NoSyncCTG|SyncCTG]
3E1B0800	*1: CopyType=TrueCopyExtendedDistance P-VOL=*2 S-VOL=*3 RemoteArraySerialNumber=*4 GroupNumber=*5 CopyPace=*6 ResumeUnit=*7	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 CTG number *6 Copy pace [Fast|Medium|Slow] *7 Resume scope [Group|Volume]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
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]
3E1C0200	Split Local Pair: CopyType=SnapShot P-VOL=*1 S-VOL=*2 SuspendUnit=*3 Discription=*4	Split a SnapShot pair *1 P-VOL number *2 S-VOL number *3 Suspend scope [Group|Volume] *4 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	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]

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 DataPool=*5	Split after SnapShot pair crating *1 Pair name *2 P-VOL number *3 S-VOL number *4 Copy pace [Fast|Medium|Slow] *5 Pool ID
3E1D0100	Delete Pair: CopyType=*1 P-VOL=*2 S-VOL=*3	Deleting a pair (ShadowImage/ SnapShot) *1 Copy class [ShadowImage|SnapShot] *2 P-VOL number *3 S-VOL number
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
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
3E200100	Set Command Devices	Setting a Command Devices
3E200200	Release Command Devices	Releasing the Command Devices
3E200300	Set RAID Manager Protect for Command Devices	Setting the RAID Manager Protect function
3E220100	Unify MainLU[*1] and SubLU[*2]	Unifying LUs (***Note*** 3) *1 MainLU number *2 SubLU number
3E220200	Separate SubLU from MainLU[*1]	Separating all unified LUs *1 MainLU number
3E220300	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

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E240100	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
3E240200	Delete Remote Path: SerialNumber=*1	Deleting the remote path information *1 Remote array serial number
3E240300	Recover Remote Path: Path=*1 SerialNumber=*2	Recovery the remote path *1 Path number [0|1] *2 Remote array serial number
3E240500	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
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 Distance (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

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E240700	Set Distributed Mode: *1	Setting a Distributed mode of TrueCopy Modular Distributed *1 Distributed mode [Hub | Edge]
3E350100	Set Host Group	Setting a host group information
3E390100	Set System Parameter/LAN Port Number: WN=*1 URES=*2 AUREC=*3 WTHR=*4 SHAD_IO=*5 CACHEXE=*6 DETACH=*7 DETACH_TH=*8 OP_FAIL=*9 Title=*10 CTL0_WV=*11 CTL1_WV=*12 CTL0_NonSP=*13 CTL1_NonSP=*14 CTL0_NonSPNum=*15 CTL1_NonSPNum=*16 CTL0_SPNum=*17 CTL1_SPNum=*18	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 Operation if the Processor failures Occurs [ResetTheFault|ShutdownTheSystem] *10 Web Title *11 CTL0 Write & Verify Execution Mode (***Note*** 5) [ON|OFF] *12 CTL1 Write & Verify Execution Mode [ON|OFF] Setting a LAN port number *13 CTL0 (LAN normal port open/close status) [Enable|Disable] *14 CTL1 (LAN normal port open/close status) [Enable|Disable] (***Note*** 5) *15 CTL0 (LAN normal port number) *16 CTL1 (LAN normal port number) (***Note*** 5) *17 CTL0 (LAN secure port number) *18 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	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]
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: -)
3E3F0200	Set Data Retention: ExpirationLock=*1	Setting the Expiration Lock *1 Expiration lock [ON|OFF]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E410100	Set Performance Statistics: Port=*1 RG_LU=*2 Cache=*3 PRO=*4 DR=*5 DR_OP=*6 Back=*7	Setting the collection of performance statistics *1 Port information [ON|OFF] *2 RAID Group/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]
3E460100	Format LU[*1]	Formatting of a LU *1 LU number
3E460200	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) [Other|FF|0]
3E480100	Change SATA Options: SMART=*1 Threshold=*2%	Setting the SATA drive options *1 SMART function [Enable|Disable] *2 Threshold of reassign mount (***Note*** 6)
3E490100	Set SATA Restore Options: CorrectionCopyMount=*1time(s)	Setting the SATA drive restore options *1 Correction copy mount
3E4A0100	Set Remote Path(System Upgrade): SerialNumber=*1	Setting a remote array serial number of TrueCopy or TCE *1 Remote array serial number
3E4B0100	Start Parity Correction: LU[*1]	Specifying starting of parity correction *1 LU number
3E4B0200	Skip Parity Correction: LU[*1]	Specifying skip of parity correction *1 LU number
3E4B0300	Cancel Parity Correction: LU[*1]	Specifying stop of parity correction *1 LU number
3E520100	Change LU Mapping Guard	Changing of the mapping guard setting

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E550100	Install: *1 UserRegistrationWizard=*2	Installing the priced option *1 The priced option name *2 User Registration Wizard [Start|NotStart]
3E550200	De-install: *1	Uninstalling the priced option *1 The priced option name
3E550300	Enable: *1 UserRegistrationWizard=*2	Validation of a priced option *1 The priced option name *2 User Registration Wizard [Start|NotStart]
3E550400	Disable: *1	Invalidation of a priced option *1 The priced option name
3E550500	Reconfigure Memory	Specifying the memory reconfiguring
3E550600	Cancel Reconfigure	Canceling the memory reconfiguring
3E570100	Automatic Download Mode: ENCMicro= *1 DriveFirmware=*2 AirFilterTimer=*3 DPCapacityMode=*4	Setting of the options *1 ENC Micro [Enable|Disable] *2 Drive Firmware [Enable|Disable] *3 Air Filter Timer [Enable|Disable|Reset] *4 DP Capacity Mode [Regular Capacity | Maximum Capacity).
3E620100	Set DM-LU: LU[*1]	Setting the DM-LU *1 LU number
3E620200	Release DM-LU: LU[*1]	Releasing the DM-LU *1 LU number
3E630100	Set Cache Partition	Registering the Cache Partition information
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

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
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
3E8D0100	For AMS/SMS Set iSCSI Port: <Port0A IP=*1 Subnet=*2 Gateway=*3 Port=*4 *5sec MTU=*6bytes H_Digest=*7 D_Digest=*8> <Port0B IP=*1 Subnet=*2 Gateway=*3 Port=*4 *5sec MTU=*6bytes H_Digest=*7 D_Digest=*8> <Port0E IP=*1 Subnet=*2 Gateway=*3 Port=*4 *5sec MTU=*6bytes H_Digest=*7 D_Digest=*8> <Port0F IP=*1 Subnet=*2 Gateway=*3 Port=*4 *5Sec MTU=*6bytesH_Digest=*7 D_Digest=*8> <Port1A IP=*1 Subnet=*2 Gateway=*3 Port=*4 *5sec MTU=*6bytes H_Digest=*7 D_Digest=*8> <Port1B IP=*1 Subnet=*2 Gateway=*3 Port=*4 *5sec MTU=*6bytes H_Digest=*7 D_Digest=*8> <Port1E IP=*1 Subnet=*2 Gateway=*3 Port=*4 *5sec MTU=*6bytes H_Digest=*7 D_Digest=*8> <Port1F IP=*1 Subnet=*2 Gateway=*3 Port=*4 *5sec MTU=*6bytes H_Digest=*7 D_Digest=*8> For E-XS Set iSCSI Port: <Port0A IP=*1 Subnet=*2 Gateway=*3 Port=*4 *5sec MTU=*6bytes H_Digest=*7 D_Digest=*8> <Port0B IP=*1 Subnet=*2 Gateway=*3 Port=*4 *5sec MTU=*6bytes H_Digest=*7 D_Digest=*8> <Port0E IP=# Subnet=# Gateway=# Port=# #sec MTU=#bytes H_Digest=# D_Digest=#> <Port0F IP=# Subnet=# Gateway=# Port=# #Sec MTU=#bytes H_Digest=# D_Digest=#> <Port1A IP=*1 Subnet=*2 Gateway=*3 Port=*4 *5sec MTU=*6bytes H_Digest=*7 D_Digest=*8> <Port1B IP=*1 Subnet=*2 Gateway=*3 Port=*4 *5sec MTU=*6bytes H_Digest=*7 D_Digest=*8> <Port1E IP=# Subnet=# Gateway=# Port=# #sec MTU=#bytes H_Digest=# D_Digest=#> <Port1F IP=# Subnet=# Gateway=# Port=# *5sec MTU=#bytes H_Digest=# D_Digest=#>	Setting the LAN information of iSCSI ports (***Note*** 12) *1 IP address *2 Subnet mask *3 Default gateway address *4 Port number of TCP/IP *5 Keep Alive time *6 MTU (Maximum Transmission Unit) [1500|4500|9000] *7 Header Digest [Enable | Disable] (***Note*** 15) *8 Data Digest [Enable | disable] (***Note*** 15)
3E8E0100	Change CHAP User Settings: Port*1	Setting the iSCSI CHAP User information *1 Port number [0A|0B|1A|1B]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E900100	Set Target Information(iSCSI): Port*1	Setting the iSCSI target information *1 Port number [0A|0B|1A|1B]
3E910100	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*** 8) *1 Whether to use the iSNS server or not [ON|OFF] *2 IP address (***Note*** 9) *3 Port number of TCP/IP (***Note*** 9)
3E920100	Send Ping	Sending ping
3E930100	Set Initiator Information(iSCSI): Port*1	Setting the iSCSI initiator information *1 Port number [0A|0B|0E|0F|1A|1B|1E|1F]
3E940100	Modify Port Options	Setting the port options by the constitution file
3E950100	Set LU Mapping	Setting the mapping information of LUs or batch setting the mapping information of LUs per port (by the constitution file)
3E970100	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]
3E970200	Cancel Volume Migration: P-VOL[*1] S-VOL[*2]	Terminating Volume Migration *1 P-VOL number *2 S-VOL number
3E970300	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
3E970400	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
3E980100	*1 Reserve LU for Volume Migration: LU[*2]	Defining or releasing reserved LU for Volume Migration *1 [Add|Delete] *2 Reserved LU number

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3E990100	Execute LRC Check	Specifying starting of LRC check
3E990200	Cancel LRC Check	Specifying stopping of LRC check
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
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

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
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 *1 RAID group number *2 Detailed setting of spin down [Spindown Only|Traypoweroff] *3 IO 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]	Specifying LED turning on (AMS2100) *1 Information Unit 0 to Unit 7 Displaying 0 or 1 corresponding bit per 8 trays 0: OFF 1: ON
3EBE0200	Enable Locate: Unit0-Unit7[*1] Unit8-Unit15[*2]	Specifying LED turning on (AMS2300) *1 Information Unit 0 to Unit 7 *2 Information Unit 8 to Unit 15 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]	Specifying LED turning on (AMS2500) *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 Displaying 0 or 1 corresponding bit per 8 trays 0: OFF 1: ON
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]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
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 RemoteReplicationWriteControlMode=*4	Setting of TrueCopy options *1 Cycle time *2 Cycle over message [Enable|Disable] *3 Inhibiting time of queuing *4 Remote array write control mode [Enable|Disable]
3EC10200	Initialize TrueCopy Options	Initializing the setting options of TrueCopy
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	Setting a pair definition information *1 Copy type [ShadowImage|SnapShot| TrueCopy| TrueCopyExtendedDistance] *2 P-VOL number *3 S-VOL number *4 Pair name *5 Copy pace [Fast|Medium|Slow]
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]
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
3ED30200	Change Priority of RG Expansion: Priority=*1	Changing of RAID group expansion priority *1 Priority [HostAccess|RGExpansion]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
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)
3ED60100	Create DP_Pool: DP_Pool[*1] <ConsumedCapacityAlert: EarlyAlert=*2% Depletion=*3%> Notification=*4><OverProvisioningThreshold: Warning=*5% Limit=*6%> Notification=*7>	Creating 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]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3ED60200	Expand DP_Pool: DP_Pool[*1] AddDrives=Unit[*2]HDU[*3]OptimizingDP-*4	Expansion of DP pool *1 DP pool number [Optional character string] *2 Adding drives unit number *3 Adding drives HDU number *4 Optimizing of the DP pool [Yes|No]
3ED60300	Delete DP_Pool: DP_Pool[*1]	Deleting of DP pool *1 DP pool number [Optional character string]
3ED60400	Change DP_Pool: DP_Pool[*1] <ConsumedCapacityAlert: EarlyAlert=*2% Depletion=*3%> Notification=*4><OverProvisioningThreshold: Warning=*5% Limit=*6%> OverProvisioningNotice=*7>	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]
3ED60500	Restore DP_Pool: DP_Pool[*1]	Recovering of DP pool *1 DP pool number [Optional character string]
3EDA0100	Optimize DP_Pool: AllLUsInTheDP_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]

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3EDA0200	Cancel the Optimization of DP_Pool: AlllLUsinTheDP_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]
3EDA0400	Change Provisioning Attribute AcceleratedWideStripingMode=*1 OptimizingDP=*2 FullCapacityMode=*3	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]
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
3EE10200	Restore Master Authentication Key	Restore Master Authentication Key for the Self-Encrypting Drive
3EE10300	Refresh Authentication Keys	Refresh Master Authentication Key and Authentication Keys for the Self-Encrypting Drive
3F010100	Configuration failed: Inappropriate parameters	Configuration failed for inappropriate parameters

Table A-2: Audit Log Entry Details (Continued)

Code	Message	Explanation
3F020100	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
3F030100	Configuration failed: Temporary/Emergency Key[*1] expired	Configuration failed for the temporary or emergency key is expired (***Note*** 11) *1 The priced option name
41040100	Session Timeout: *1	Session timeout occurs of the already logged in with Account Authentication user ID *1 User ID
41090100	Reference/Modification failed: Authentication authority is insufficient	Referencing or modification failed for Authentication authority is insufficient
51010100	Start Online Microprogram Download	Starting the firmware downloading online
51010200	Start Online Microprogram Update: CTL*1	Starting the firmware updating online *1 Controller number
51020100	Start ENC Microprogram Download	Starting ENC firmware downloading online
51020200	Start ENC Microprogram Update: ENC*1	Starting ENC firmware updating online *1 ENC number
51030100	System Reboot	Rebooting after the system configuration
51030200	Release Reboot Wait Condition: CTL*1	Releasing reboot wait condition *1 Controller number
52010100	System Shutdown (Reboot Request)	Reboot request from Navigator 2
71010100	Subsystem is Ready	Array is ready
71020100	PS OFF	Array power off

Notes on the above table:

Note 1: If this is Disable, # is output.

Note 2: When the *1 is Disable, # is 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 output for the SubLU.

Note 5: If there is only one CTL, # is output.

Note 6: When the *6 is Disable, # is output.

Note 7: If there is only one CTL, # is output for all the parameters on the CTL1 side.

Note 8: If only one parameter is set, # is output for the other one.

Note 9: When *1 is OFF, # is output.

Note 10: When the *1 is ON and the server 2 is not set, # is 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 iSCSI port, # is output.

Note 13: When the *3 is RG, # is output.

Note 14: When this is not changed, # is output.

Note 15: When the transfer rate is 1 Gbps, the iSCSI Digest features is not supported. Therefor when the *7 or *8 items are enabled, the output status is “Failed” in the “Result of the audit event” portion of the “Comment part in MSG.”

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

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 enbabled, 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.

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] ? 1440
  Free Size[MB]
    CTL0?   0
    CTL1?   0
  No.  CTL        Partition Size[10MB]      Segment Size[KB]
    0    0                          72                    16
    1    1                          72                    16

Reserved Information
  No.  CTL        Partition Size[10MB]      Segment Size[KB]
    0    0                          72                    16
    1    1                          72                    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
se

tting 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
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
effe
ctive 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
pair 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
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 6 - 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 -segsize 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
effe

ctive 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 6- 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
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 6 - 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
  LUN   Partition Partition   Partition
    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
p
artition 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
effe
ctive 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
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 6 - 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 6 - 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 6 - 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
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.
%

% 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 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.
%

% auopt -unit array-name -refer
Option Name    Type       Term     Status
       Reconfigure Memory Status
CACHERESIDENCYPermanent  ---      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
effe
ctive 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
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.
%
```

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
- Changing the retention term
- 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.

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
fr
om 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
fr
om 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   ---              ---
%
```

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: ams2300
   - Controller: 0
   - Port: A

   Use **off** with **-hgs** option, when disabled LUN Manager is changed.

```
% auhgwwn -unit ams2300 -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 h
ost.
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 ams2300 -refer
Port  0A  Host Group Security  ON
  Detected WWN
    Name                              Port Name
  Assigned WWN
    Name                              Port Name         Host Group
  Assignable WWN
    Name                              Port Name
Port  0B  Host Group Security  OFF
Port  1A  Host Group Security  OFF
Port  1B  Host Group Security  OFF
%
```

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: ams2300
   - 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: ams2300
   - Controller: 0
   - Port: A
   - Host group number: 1
   - Logical unit to be recognized by the host: 0
   - Array
   - internal logical unit: 0

```
% auhgmap -unit ams2300 -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 ams2300 -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-73).

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. auhgwwn command to specify the array.
4. Use the following settings:
   - Array name: ams2300
   - Controller: 0
   - Port: A
   - Host group number: 1

- Host information (port name): 200000e069402a08
- WWN nickname: win001

```
%auhgwwn -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 ams2300 -refer
Port  0A  Host Group Security  ON
  Detected WWN
    Name                              Port Name
  Assigned WWN
    Name                              Port Name          Host Group
    win001                            200000E069402A08   001:win001
  Assignable WWN
    Name                              Port Name
Port  0B  Host Group Security  OFF
Port  1A  Host Group Security  OFF
Port  1B  Host Group Security  OFF
%
```

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: ams2300
   - Controller: 0
   - Port: A
   - Host group number: 0

```
% auhgwwn -unit ams2300 -refer -permhg 0 A -gno 0
Port  0A  Host Group Security  ON
  Assigned WWN
    Name                              Port Name          Host Group
  Assignable WWN
    Name                              Port Name
                                      10000000C9290680

% auhgwwn -unit ams2300 -assign -permhg 0 A 10000000C9290680 -gno 0
The security information has been set successfully.

% auhgwwn -unit ams2300 -refer -permhg 0 A -gno 0
Port  0A  Host Group Security  ON
  Assigned WWN
    Name                              Port Name          Host Group
                                      10000000C9290680   000:G000
  Assignable WWN
    Name                              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: sa800
   - Controller: 0
   - Port: A
   - Host group number: 1
   - New host group name: win00

```
% auhgdef -unit sa800 -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: sa800
   - Controller: 0
   - Port: A
   - Host group number: 1

```
% auhgdef -unit sa800 –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: sa800
   - Controller: 0
   - Port: A

```
% auhgdef -unit sa800 -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.

2. Execute the auhgwwn command to specify the array. Use the following settings:
   - Array name: sa800
   - Controller: 0
   - Port: A
   - Host
   - group number: 1
   - Host information (port name): 200000e069402a08
   - WWN nick name: winNT01

   ```
   %auhgwwn -unit sa800 -chg -rename 0 A 200000e069402a08 -gno 1 -newwname
   winNT01
   The security information has been set successfully.
   %
   ```

3. Specify as shown when setting the following information:

   ```
   % auhgwwn -unit sa800 –refer
   Port  0A  Host Group Security  ON
     Detected WWN
       Name                              Port Name
     Assigned WWN
       Name                              Port Name         Host Group
       winNT01                           200000E069402A08  001:win001
     Assignable WWN
       Name                              Port Name
   Port  0B  Host Group Security  OFF
   Port  1A  Host Group Security  OFF
   Port  1B  Host Group Security  OFF
   %
   ```

Deleting a WWN

To delete the WWN on the assigned 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: sa800
- Controller: 0
- Port: A
- Host
- group number: 0
- Host information (port name): 200000e069402a08

```
% auhgwwn -unit sa800 -rm -permhg 0 A 200000e069402a08 -gno 0
The security information has been set successfully.
%
```

3. Specify as shown when setting the following information:

```
% auhgwwn -unit sa800 -refer -permhg 0 A -gno 0
Port  0A  Host Group Security  ON
  Assigned WWN
    Name                                Port Name         Host Group
  Assignable WWN
    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: sa800
   - Controller: 0
   - Port: A
   - Host information (port name): 200000e069402a08

```
% auhgwwn -unit sa800 -refer -login 0 A
Port  0A  Host Group Security  ON
  Detected WWN
    Name                              Port Name
    Linux                             200000E069402A08
                                      10000000C9290680
%
% auhgwwn -unit sa800 -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: **ams2300**
   - Controller: **0**
   - Port: **A**
   - Use `off` with `-tgs` option, when disabled LUN Manager is changed.

```
% autargetini  -unit ams2300 -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 h
ost.
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 ams2300 -refer
Port  0A  Target Security  ON
  Target                              Name                            iSCSI Na
me
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: **ams2300**
   - Controller: **0**
   - Port: **A**
   - Target number: **1**
   - Target 1 alias: **win001**
   - Target 1 iSCSI name: **iqn.df800-1**
   - Authentication Method: **None**
4. Specify the -talias option for the tail end.

```
% autargetdef -unit ams2300 -add 0 A -tno 1 -iname iqn.df800-1 -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 ams2300 -refer
Port  0A
                                  Authentcation                  Mutual
  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.00007.0a000
  001: win001                     None           ---              ---

    User Name  : ---
    iSCSI Name : iqn.df800-1
Port 0B
                                  Authentication                 Mutual
  Target                          Method        CHAP Algorithm   Authentic
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: **ams2300**
   - Controller: **0**
   - Port: **A**
   - Target number: **1**
   - Logical unit to be recognized by the host: **0**
   - Array internal logical unit: **0**

```
% autargetmap -unit ams2300 -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 ams2300 -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: ams2300
   - Controller: 0
   - Port: A
   - Target number: 1
   - Initiator name: Linux
   - Initiator iSCSI Name: iqn.1991-05.com

```
%autargetini -unit ams2300 -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: **ams2300**
   - Controller: **0**
   - Port: **A**
   - Target number: **1**
   - New target alias: **win002**

```
% autargetdef -unit ams2300 -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: ams2300
   - Controller: 0
   - Port: A
   - Target number: 1

```
% autargetdef -unit ams2300 -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: ams2300
   - Controller: 0
   - Port: A

```
% autargetdef -unit ams2300 -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: **ams2300**
   - Controller: **0**
   - Port: **A**
   - Current Initiator iSCSI Name: **iqn.1991-05.com**
   - New Initiator Initiator iSCSI Name: **iqn.1994-04.com**

```
%autargetini -unit ams2300 -chg 0 A -iname iqn.df800-1 -newiname iqn.1994-
04.com
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: **ams2300**
   - Controller: **0**
   - Port: **A**
   - Target number: **1**
   - Initiator iSCSI name: **iqn.1994-04.com**

```
%autargetini -unit ams2300 -rm 0 A -tno 1 -iname iqn.1994-04.com
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: **ams2300**
   - Controller: **0**
   - Port: **A**
   - Target number: **1**
   - CHAP user name: **mng001**

```
%auchapuser -unit ams2300 -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: **ams2300**
   - Controller: **0**
   - Port: **A**
   - CHAP user name: **mng001**
   - Current assigned target number: **0**
   - New assigned target number: **1**

```
%auchapuser -unit ams2300 -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: **ams2300**
   - Controller: **0**
   - Port: **A**
   - CHAP user name: **mng001**

```
%auchapuser -unit ams2300 -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.
%
```

Data at Rest Encryption

Installing

Since Data At Rest Encryption is an extra-cost option, Data At Rest Encryption cannot usually be selected (locked) when first using the array. To make Data At Rest Encryption available, you must install Data At Rest Encryption and make its function selectable (unlocked).

Data At Rest Encryption can be installed from Storage Navigator Modular 2. This section describes the installation/un-installation procedures performed by using Storage Navigator Modular 2 via the Command Line Interface (CLI).

Before installing/uninstalling Data At Rest Encryption, verify that array is operating in a normal state. If a failure such as a controller blockade has occurred, installation/un-installation cannot be performed.

To install Data At Rest Encryption, the key code or key file provided with the optional feature is required. The following describes the installation procedure:

1. From the command prompt, register the array in which Data At Rest Encryption is to be installed, and then connect to the array.
2. Execute the auopt command to install Data At Rest Encryption. The example is shown below.

```
% 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 confirm whether Data At Rest Encryption has been installed. The example is shown below.

```
% auopt -unit array-name -refer
Option NameType      Term     Status
       Reconfigure Memory Status
DAR-ENCRYPTPermanent ---      Enable
       N/A
%
```

   Data At Rest Encryption is installed and the status is Enable. Installation of Data At Rest Encryption is now complete.

   In two minutes immediately after installed the license, the RAID group creation, the DP pool creation, and the spare drive assignment may not be possible for the SED (if the operation is executed, an error message is displayed). At this time, if another instruction (creating LUs, issuing multiple CLI commands, etc.) is provided by Storage Navigator Modular 2, the time until these operations are enabled may be further prolonged from two minutes. After the status of **All Key Information** becomes **Normal**, perform those operations in the following method.

4. Execute the auencrypt command to confirm the **All Key Information**.

```
% auencrypt -unit array-name –refer
Key Information
  All Key Information : Normal
  Master Authentication Key
    Created Date : 2011/1/20 09:00:00
```

```
ID        : 8500002600001
%
```

5. Perform the RAID group creation, DP pool creation, and/or spare drive assignment after **All Key Information** becomes **Normal**.

Uninstalling

To uninstall Data At Rest Encryption, the key code provided with the optional feature is required. Once uninstalled, Data At Rest Encryption 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 Data At Rest Encryption.

- SEDs not mounted in array.
- Furthermore, be sure to perform the backed-up master authentication key uninstalling or disabling Data At Rest Encryption.
- Those SEDs cannot be used again even in the same array after uninstalling or disabling (contact Technical Support for reusing since the backed-up master authentication key needs to be restored).

To uninstall Data At Rest Encryption:

1. From the command prompt, register the array in which Data At Rest Encryption is to be uninstalled, and then connect to the array.
2. Execute the auopt command to uninstall Data At Rest Encryption. The example is shown below.

```
% 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 confirm whether Data At Rest Encryption has been uninstalled. The example is shown below.

```
% auopt -unit array-name -refer
DMEC002015: No information displayed.
%
```

Uninstalling Data At Rest Encryption is now complete.

Enabling or Disabling

Data At Rest Encryption can be set to “enable” or “disable” when it is installed. The following conditions must be satisfied in order to disable Data At Rest Encryption:

- SEDs not mounted in array.
- Furthermore, be sure to perform the backed-up master authentication key uninstalling or disabling Data At Rest Encryption.

- Those SEDs cannot be used again even in the same array after uninstalling or disabling (contact Technical Support for reusing since the backed-up master authentication key needs to be restored).

To enable or disable Data At Rest Encryption:

1. From the command prompt, register the array in which the status of the feature is to be changed, and then connect to the array.
2. Execute the auopt command to change the status (enable or disable).

   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 array-name –option DAR-ENCRYPT –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 confirm whether the status has been changed. The example is shown below.

```
% auopt -unit array-name -refer
Option NameType      Term     Status
       Reconfigure Memory Status
DAR-ENCRYPTPermanent ---      Disable
       N/A
%
```

Enabling or disabling Data At Rest Encryption is now complete.

In two minutes immediately after enabled the license, the RAID group creation, the DP pool creation, and the spare drive assignment may not be possible for the SED (if the operation is executed, an error message is displayed). At this time, if another instruction (creating LUs, issuing multiple CLI commands, etc.) is provided by Storage Navigator Modular 2, the time until these operations are enabled may be further prolonged from two minutes. After the status of **All Key Information** becomes **Normal**, perform those operations in the following method.

1. Execute the auencrypt command to confirm the **All Key Information**.

```
% auencrypt -unit array-name –refer
Key Information
  All Key Information : Normal
  Master Authentication Key
    Created Date : 2011/1/20 09:00:00
    ID           : 8500002600001

%
```

Perform the RAID group creation, DP pool creation, and/or spare drive assignment after **All Key Information** becomes **Normal**.

Back Up the Master Key

Back up the master authentication key provided for failures or others of the array.

1. From the command prompt, connect the disk array in which you want to back up the master key.

2. Execute the auencrypt command to back up the master key.

```
% auencrypt –unit disk array-name –backup
Are you sure you want to back up the master authentication key? (y/n [n]): y
Please enter the password for backing up a master authentication key.
Password:
Retype Password:
Master authentication key has been backed up successfully.
Output file name: authenticatemasterkey_85000026_20101115
%
```

Refresh the Authentication Keys

The master authentication key can be refreshed. The number of times which can be updated is infinite.

1. From the command prompt, connect the disk array in which you want to refresh the authentication keys.
2. Execute the auencrypt command to refresh the authentication keys.

```
% auencrypt –unit disk array-name –refresh
Are you sure you want to refresh and back up the master authentication key? (y/n [n]): y
Please enter the password for backing up a master authentication key.
Password:
Retype Password:
Master authentication key has been refreshed and backed up successfully.
Output file name: authenticatemasterkey_85000026_20101115
%
```

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.

Array

A set of hard disks grouped logically together to function as one contiguous storage space.

A

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.

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 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.

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.

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.

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; 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.

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.

SATA

Serial ATA is a computer bus technology primarily designed for the transfer of data to and from hard disks and optical drives. SATA is the evolution of the legacy Advanced Technology Attachment (ATA) interface from a parallel bus to serial connection architecture.

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.

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 (SNM2)

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 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.

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