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Hitachi Freedom Storage™ Thunder 9200™

Resource Manager 9200 User's Guide Command Line Interface (CLI)

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Document Revision Level

Revision	Date	Description
MK-92DF574-0	February 2002	Initial Release
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Source Documents for this Revision

The following source document was used to produce this 9200 user guide:

- *Disk Array Management Program (for CLI) User's Guide*, Revision 21.

Changes in this Revision

- In 3.1.5 Command Help, two options were added.
- In 3.2.2 Registering, format revisions were added.
- In 3.5.14 Unifying LUs, one option was added.
- In 3.5.15 Separating LUs, one option was added.
- In 3.6.3 Referencing/Setting Fee-Basis Option, format revisions were added.
- In 3.6.6 Referencing/Setting ShadowImage 9200 Information, format revisions were added.
- In 3.6.9 Referencing/Setting the Remote Path Information, one option was revised.
- In 3.7.1 Referencing/Setting System Parameters:
  - Format revisions were added.
  - Options were added.
  - Examples were revised.
- In 3.7.6 Referencing/Setting the Port Option and Controller Identifier:
  - Format revisions were added (to both Fibre and SCSI versions).
  - Options were added.
  - Examples were revised.
- In 3.7.7 Setting Target Information Online, one option was added.

- In 3.8.3 Setting the Configuration from a File: System Parameters, one option was revised.
- In 3.8.4 Setting the Configuration from a File: RAID/LU Definition:
  - LU configuration information was revised.
  - One option was revised.
- In Setting Up E-Mail Reports Monitoring Errors, one option was revised.

Preface

The *Hitachi Freedom Storage ™ Thunder 9200 ™ Resource Manager 9200 User's Guide Command Line Interface (CLI)* describes the operations required to execute the configuration setting and display, information display, and error monitoring of the Hitachi disk array unit subsystem (9200) using the Resource Manager 9200 program via the CLI.

Notes on Use:

- This manual is intended for users with a background in data processing and who understand direct-access storage device subsystems and their basic functions. Specific examples of appropriate users include: system administrators — responsible for operation of systems including array units, system engineers — for construction of systems including array units, and customer support engineers — for maintenance of array units.
- The user needs to be familiar with the Hitachi Freedom Storage ™ Thunder 9200 ™ array subsystem.
- When using the manager, be sure to read this manual and understand the operating procedures and instructions described herein thoroughly before starting your operation. Understand, in particular, the descriptions in the section **Safety Precautions** thoroughly and follow the instructions in this manual.
- The user is presupposed to have thorough knowledge of the basic operation of Windows®, Solaris™, and IRIX®.
- "Windows® 95", "Windows® 98", "Windows® 2000" and "Windows NT® Version 4.0" are abbreviated to "Windows®" in the manual.
- This manual quotes screens that appear when the Resource Manager 9200 program runs with Windows NT® 4.0, and when an array unit is configured from a dual system and is connected to a LAN. When the program runs with Windows® 95, Windows® 98, Windows® 2000, Solaris™, and IRIX®, displays on some screens differ from those on corresponding screens shown in this manual.

For further information on Hitachi Data Systems products and services, please contact your Hitachi Data Systems account team, or visit the Hitachi Data Systems worldwide web site at http://www.hds.com. For specific information on the supported host systems and platforms for the 9200, please refer to the user documentation for the product, or contact the vendor's customer support service.

Note 1: The term "9200" refers to the Hitachi Thunder 9200™ subsystem, unless otherwise noted. Please refer to the *Hitachi Thunder 9200™ User and Reference Guide* (MK-90DF504) for further information on the 9200 disk array subsystem.

Note 2: Throughout this manual, **the term "Disk Array Management Program (DAMP) 2" refers to the Resource Manager 9200 program**.

Note 3: The use of Resource Manager 9200 and all other Hitachi Data Systems products is governed by the terms of your license agreement(s) with Hitachi Data Systems.

Note 4: For information on password protection, please refer to the *Hitachi Thunder 9200™ Password Protection User's Guide* (MK-91DF555).

COMMENTS

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Make sure to include the document title, number, and revision.
Please refer to specific page(s) and paragraph(s) whenever possible.

(All comments become the property of Hitachi Data Systems Corporation.)

Thank you!

Safety Precautions

Note the following when using Resource Manager 9200:

- Only administrators, system engineers, and field engineers who are familiar with Hitachi Data Systems disk array units are allowed to run Resource Manager 9200 function.
- Make certain you read and fully understand this guide before you operate the Resource Manager 9200 function.
- Carefully follow instructions included with the "CAUTION" label.

  

  Failure to follow these instructions can result in serious system damage and/or the loss of system data.

Cautions to Observe While Starting Your Operation

- While operating Resource Manager 9200, the contents of array unit errors may be displayed as error messages. Read the User's Manual or Maintenance Manual to look up the appropriate action to be taken and handle the error accordingly.
- When performing operations in this manual that are preceded by a CAUTION label, read the instructions before starting the operation and follow them carefully during operation.

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Chapter 1 Resource Manager 9200

The Resource Manager 9200 is a collection of the commands (executed in command line mode) to reference status and set up the configuration of an array unit. The user operates these commands in a prompt state by selecting a command with the function appropriate for a user's purpose. This chapter includes the following:

- Notes on Using Resource Manager 9200
- Operating Environments
- Connecting
- Installing
- Updating
- Uninstalling

1.1 Notes on Using Resource Manager 9200

When using Resource Manager 9200, consider the following:

⚠ CAUTION

- When using Resource Manager 9200 on "RS232C connection", the "ERROR INF" (a function to specify an error information transfer mode to the RS232C port) must be set to "OFF" (suspension of the error information transfer) by means of the system parameter setting function of the array unit.

  (The "ERROR INF" is set to "OFF" when shipped from the factory.) Otherwise, it may cause Resource Manager 9200 to fail to connect to the array unit or functions of Resource Manager 9200 to end abnormally.

- Regarding the functions to be executed by Resource Manager 9200, some are available and others are not available while the array unit is online with a host. For details, see Chapter 2.

  When high I/O load exists, functions that are available while online might cause a command time-out in the host or a recovering fault in Resource Manager 9200. It is recommended that these functions be executed while offline.

- When the Resource Manager 9200 is installed in the host connected to the array unit, I/O load from a host might cause a command time-out on the host side or an abnormal termination on the Manager side. It is recommended that the Resource Manager be installed in the host NOT connected to the array unit.

- At least one logical unit must be configured in the array unit, to make all of the Resource Manager 9200 functions available. If no logical unit is defined in the array unit, some functions cannot be executed.

- Resource Manager 9200 can control up to 1,024 array units. Configurations (setting of RAID groups, logical units, etc.) can be done on one array unit at a time. Error Alert monitoring must be stopped to configure array units.

- When the PC enters the suspension state (low power mode) while the Resource Manager 9200 is running, Resource Manager 9200 may not operate correctly after the PC is released from the suspension state.

  When you operate Resource Manager 9200, disable power management by Windows® so that the PC will not enter the suspension state.

- Resource Manager 9200 may hang up in the following cases.
  - The communication with the connected array unit fails due to controller blockage, array unit failure, or disconnected LAN connection, etc., or in case that the array unit receives a Reset/LIP from the host.
  - Other application works at the same time, and a CPU use rate is high.

  If Resource Manager 9200 hangs up, terminate it forcibly and check the array unit status and the connection status of RS232C or LAN. Then, boot up Resource Manager 9200 once again. Start Resource Manager 9200 when you have finished other applications.

- If the Resource Manager 9200 is used together with other programs for one array unit, the following restrictions apply.

Table 1.1 Restrictions when Multiple Programs are used Concurrently for One Array Unit

No.	Program name	1	2	3	4	5	6	7
1	Disk Array management program (LAN)	×	Δ	×	Δ	×	○	○
2	Disk Array management program (RS232C connection)	Δ	×	Δ	×	Δ	○	○
3	Disk Array utility (LAN)	×	Δ	×	Δ	×	○	○
4	Disk Array utility (RS232C connection)	Δ	×	Δ	×	Δ	○	○
5	Disk Array utility for Web	×	Δ	×	Δ	×	○	○
6	SNMP Function	○	○	○	○	○	○	○
7	9200-built-in Web Server Function	○	○	○	○	○	○	○

○: Concurrent use is allowed.
×: Concurrent use is not allowed (operations performed with a program terminate abnormally).
Δ: Configuration in which concurrent use is allowed, but is not recommended.

If you run a combination of programs when concurrent use is not allowed, if a program with a usage restriction placed on it has been started, start another program of the combination after terminating the running program. To operate other programs, refer to their respective user's guides provided with the program products.

- If any array unit failure is detected, contact Hitachi maintenance personnel.

1.2 Operating Environments

Resource Manager 9200 is operated by connecting to the array unit via a LAN or RS232C. When an array unit is connected to a LAN, a host (personal computer, SUN® server/ workstation, SGI™ server/workstation, HP® server/workstation, or IBM® server/workstation), in which Resource Manager 9200 is installed, must be connected to the network and operate normally. When an array unit is connected to an RS232C interface, an RS232C port of the machine must operate normally.

- PC
  - Windows® 95, Windows® 98, Windows® 2000, or Windows NT® 4.0
  - CPU: Pentium
  - Memory: 16 MB or more is recommended
  - Disk capacity: 8.5 MB max.
  - Network adapter

- Sun® server/workstation
  - Solaris™ 2.6, 2.7, 2.8
  - CPU: UltraSPARC or more is recommended.
  - Memory: 16.5 MB
  - Disk capacity: product version 15.5 MB max, bundle version 9 MB max.
  - Network adapter

- SUN® server/workstation
  - IRIX® 6.4, 6.5
  - CPU: R10000 or more is recommended.
  - Memory: 16 MB
  - Disk capacity: product version 28 MB max, bundle version 15.5 MB max.
  - Network adapter

- HP® server/workstation
  - HP-UX® 10.20, 11.0
  - CPU: HA8000 or more is recommended.
  - Memory: 16 MB
  - Disk capacity: product version 17.5 MB max, bundle version 10 MB max.
  - Network adapter

- IBM® server/workstation
  - AIX 4.3.3, 5L
  - CPU: PowerPC/RS64 II or more is recommended.
  - Memory: 16MB
  - Disk capacity: product version 21 MB max, bundle version 11.5 MB max.
  - Network adapter
- RS232C connection
  - Serial port

    baud rate: 9600

    data bit: 8

    parity: none

    stop bit: 1

    flow control: none
  - Serial cable (9 pin, cross) for RS232C connection: 1 cable/controller

- LAN connection
  - When the array unit and the machine are connected directly, use 10BaseT/100BaseT cable (cross) or twisted pair cable (cross).

    When the array unit and machine are connected through a hub, use 10BaseT/100BaseT cable or twisted pair cable. 100BaseT works with 9200 products.

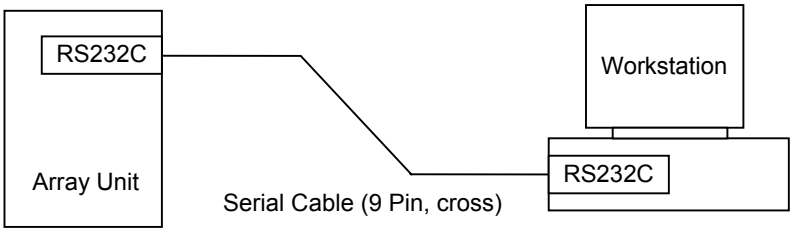
1.3 Connecting

This section provides examples of connections between a workstation in which Resource Manager 9200 has been installed and an array unit. These connections include:

- RS232C Connection
- LAN With a Hub
- LAN Without a Hub

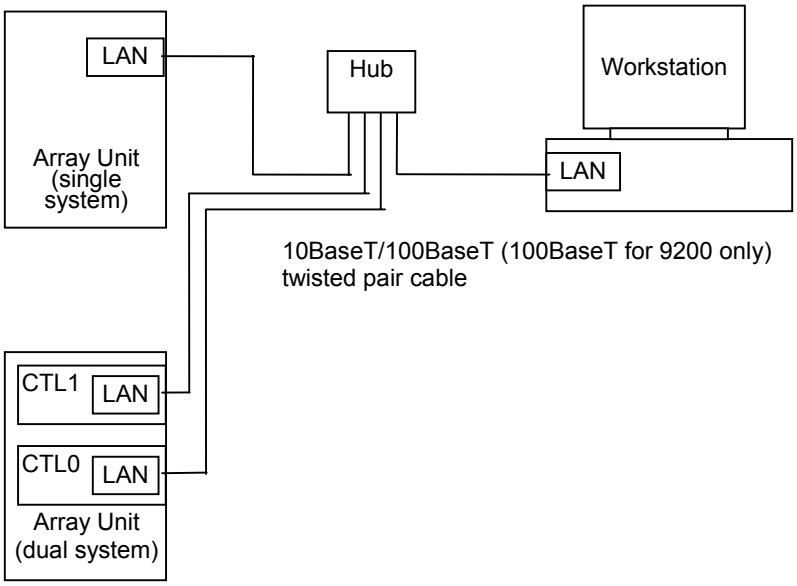
The following diagram is an example of a connection between a workstation in which Resource Manager 9200 is installed and an array unit.

- RS232C connection



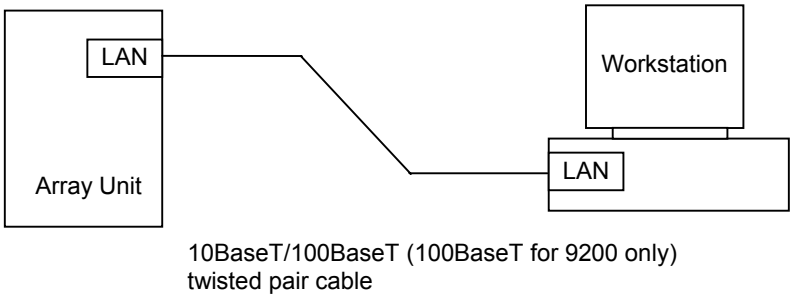
Note: In the dual system where two RS232C ports are in the workstation, connect the RS232C to both of controller 0 and controller 1.

1.3.1 LAN With a Hub



Note: If an array unit is already connected with a LAN, a workstation is connected to the same network as the array unit.

1.3.2 LAN Without a Hub



1.4 Installing

This section provides instructions for installing Resource Manager 9200 to the following systems:

- Windows®
- Solaris™
- IRIX®
- HP-UX®
- AIX®

1.4.1 Windows®

1. Start the PC, then boot up Windows®.
2. Execute the setup.exe in the CLI directory of the provided CD-R. By default, the files will be installed in \program files\da manager cli\
3. Execute the startmgr.bat (a Windows® batch file used to start the Resource Manager), The following environment parameters have to be set correctly in startmgr.bat:

```
set CMDF_ROOT_DIR_PATH=.
set LANG=en
```

Check with the command 'set' to verify the correct setting of environment parameters on the workstation

A prompt screen will be displayed and Resource Manager Commands can be executed from this screen.

Note: When executing commands from other than a directory in which the Resource Manager 9200 has been installed, edit the CMDF_ROOT_DIR_PATH environment variable of the `startmgr.bat` in the developed file. Set up the install directory of the Resource Manager 9200 in the CMDF_ROOT_DIR_PATH environment variable. However, if the LANG environment variable is not specified, the Resource Manager 9200 operates in English language mode.

Example: If Resource Manager 9200 has been installed in C:\damp:

```
set CMDF_ROOT_DIR_PATH=C:\damp
set LANG=en
command.com
```

1.4.2 Solaris™

1. Start the SUN ™ server/workstation.
2. Create a new directory (example: /usr/damp) for installing the Resource Manager 9200. Copy the `ArrayManage-xSxxx-CLI.tar` file in the supplied CD-R to the directory created in the hard disk. (The portion xSxxx of file names varies with the version of the Resource Manager 9200, etc.)
3. The `ArrayManage-xSxxx-CLI.tar` file is a Tar format file. Expand the file referring to the following example. If the directory described below is present, create another directory.

   Example:

   ```
   tar xvf ArrayManage-xSxxx-CLI.tar
   ```

   When setting /usr/damp for the install directory, the following file structure is developed.

   ```
   /usr/damp/          : executable and message files of Resource Manager
             |
             └── /lib/     : common library used when running Resource Manager
   ```

4. Add a path to the common library with the LD_LIBRARY_PATH environment variable. Example when setting DFHOME for the install directory /usr/manage/

   If the LD_LIBRARY_PATH environment variable not yet defined (example uses C shell commands):

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

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

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

5. Set up a path to the directory, in which Resource Manager 9200 has been installed, in the CMDF_ROOT_DIR_PATH environment variable.

   Example: When setting DFHOME for the install directory (example of C shell):

   ```
   % setenv  CMDF_ROOT_DIR_PATH  ${DFHOME}
   ```

   It is recommended that environment variables be defined in the login shell of users who access the Resource Manager 9200.

6. Log in again.

1.4.3 IRIX®

1. Start the SGI™ server/workstation.
2. Create a new directory (example: /usr/damp) for installing the Resource Manager 9200. Copy the `ArrayManage-xIxxx-CLI` file in the supplied CD-R to the directory created in the hard disk. (The portion xIxxx of file names varies with the version of the Resource Manager 9200, etc.)

   Required disk capacities are approx: 21 MB for the main program storage area, 512 kB for the work area, and 6 MB when executing the microprogram replacement.
3. The `ArrayManage-xIxxx-CLI.tar` file is a Tar format file. Expand the file referring to the example. If the directory described below is present, create a new directory.

   Example:

   ```
   tar xvf ArrayManage-xIxxx-CLI.tar
   ```

   When setting /usr/damp for the install directory, the following file structure is developed.

   ```
   /usr/damp/          : Execute and message files of Resource Manager 9200
           |
           └── /lib/   : Common library used when running Resource Manager 9200
   ```
4. Add a path to the common library to the LD_LIBRARY_PATH environment variable. Example when setting DFHOME for the install directory

   If the LD_LIBRARY_PATH environment variable not yet defined (example uses C shell commands):

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

   If the LD_LIBRARY_PATH environment variable already defined (example of C shell):

   ```
   % setenv  LD_LIBRARY_PATH  $LD_LIBRARY_PATH:${DFHOME}/lib
   ```
5. Set up a path to the directory, in which the Resource Manager has been installed, in the CMDF_ROOT_DIR_PATH environment variable.

   Example: When setting DFHOME for the install directory (example using C shell commands):

   ```
   % setenv  CMDF_ROOT_DIR_PATH  ${DFHOME}
   ```

   It is recommended that statements 4 and 5 be defined in the initial setting file (for C shell: log in) of the login shell for users who access Resource Manager 9200.
6. Log in again.

1.4.4 HP-UX®

1. Start the HP® server/workstation.
2. Create a new directory (example: /usr/damp) for installing Resource Manager 9200. Copy the `ArrayManage-xHxxx-CLI.tar` file in the supplied CD-R to the directory created in the hard disk. (The portion `xHxxx` of file names varies with the version of the Resource Manager 9200, etc.)
3. The `ArrayManage-xHxxx-CLI.tar` file is a Tar format file. Expand the file referring to the following example. If the directory described below is present, create another directory.

   Example:

   ```
   tar xvf ArrayManage-xHxxx-CLI.tar
   ```

   When setting /usr/damp for the install directory, the following file structure is developed.

   ```
   /usr/damp/          :Command and message file of Resource Manager 9200
             |
             └── /lib/   :Common library used when running Resource Manager 9200
   ```

4. Add a path to the common library to the SHLIB_PATH environment variable. Example when setting DFHOME for the install directory

   If the SHLIB_PATH environment variable is not yet defined (example uses C shell commands):

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

   If the SHLIB_PATH environment variable is already defined (example uses C shell commands):

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

5. Set up a path to the directory, in which Resource Manager 9200 has been installed, in the CMDF_ROOT_DIR_PATH environment variable.

   Example: When setting DFHOME for the install directory (example of C shell):

   ```
   % setenv  CMDF_ROOT_DIR_PATH  ${DFHOME}
   ```

   It is recommended that statements 4 and 5 be defined in the initial setting file (for C shell: log in) of the login shell for users who access Resource Manager 9200.

6. Log in again.

1.4.5 AIX®

1. Start the IBM® server/workstation.
2. Create a new directory (example: /usr/damp) for installing Resource Manager 9200. Copy the `ArrayManage-xAxxx-CLI.tar` file in the supplied CD-R to the directory created in the hard disk. (The portion `xAxxx` of file names varies with the version of the Resource Manager 9200, etc.)
3. The `ArrayManage-xAxxx-CLI.tar` file is a Tar format file. Expand the file referring to the following example. If the directory described below is present, create another directory.

   Example:

   ```
   tar xvf ArrayManage-xAxxx-CLI.tar
   ```

   When setting /usr/damp for the install directory, the following file structure is developed.

   ```
   /usr/damp/          :Command and message file of Resource Manager 9200
             |
             └── /lib/   :Common library used when running Resource Manager 9200
   ```

4. Add a path to the common library to the SHLIB_PATH environment variable. Example when setting DFHOME for the install directory

   If the SHLIB_PATH environment variable is not yet defined (example uses C shell commands):

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

   If the SHLIB_PATH environment variable is already defined (example uses C shell commands):

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

5. Set up a path to the directory, in which Resource Manager 9200 has been installed, in the CMDF_ROOT_DIR_PATH environment variable.

   Example: When setting DFHOME for the install directory (example of C shell):

   ```
   % setenv  CMDF_ROOT_DIR_PATH  ${DFHOME}
   ```

   It is recommended that statements 4 and 5 be defined in the initial setting file (for C shell: log in) of the login shell for users who access Resource Manager 9200.

6. Log in again.

1.5 Updating

This section provides instructions for updating Resource Manager 9200 on the following systems:

- Windows®
- Solaris™
- IRIX®
- HP-UX®
- AIX®

Note: If you update, be sure to terminate Resource Manager 9200 before starting operations.

1.5.1 Windows®

1. Execute the `setup.exe` in the CLI directory of the provided CD-R.

The new version of Resource Manager 9200 will be installed. Windows® does not have to be restarted.

1.5.2 Solaris™

1. Copy the `ArrayManage-xSxxx-CLI.tar` file in the attached CD-R to the hard disk.
2. The `ArrayManage-xSxxx-CLI.tar` file is a Tar type file. Open the file as described in the following example. (The `xSxxx` portion of the file name varies with the version of Resource Manager 9200):

   Example:

   ```
   tar xvf ArrayManage-xSxxx-CLI.tar
   ```

The updated new version of Resource Manager 9200 will be installed. Solaris™ does not need to be restarted.

1.5.3 IRIX®

1. Copy the `ArrayManage-xIxxx-CLI.tar` file in the attached CD-R to the hard disk.
2. The `ArrayManage-xIxxx-CLI.tar` file is a Tar type file. Open the file as described in the following example. (The `xSxxx` portion of the file name varies with the version of Resource Manager 9200):

   Example:

   ```
   tar xvf ArrayManage-xIxxx-CLI.tar
   ```

The new version of Resource Manager 9200 will be installed. IRIX® does not need to be restarted.

1.5.4 HP-UX®

1. Copy the `ArrayManage-xHxxx-CLI.tar` file in the attached CD-R to the hard disk.
2. The `ArrayManage-xHxxx-CLI.tar` file is a Tar type file. Open the file as described in the following example. (The `xSxxx` portion of the file name varies with the version of Resource Manager 9200):

   Example:

   ```
   tar xvf ArrayManage-xHxxx-CLI.tar
   ```

The new version of Resource Manager 9200 will be installed. HP-UX® does not need to be restarted.

1.5.5 AIX®

1. Copy the `ArrayManage-xHxxx-CLI.tar` file in the attached CD-R to the hard disk.
2. Execute the `slibclean` command. You must have root permission to execute the `slibclean` command. If this command is executed without root permission, delete the library file `libdau.a`..
3. The `ArrayManage-xHxxx-CLI.tar` file is a Tar type file. Open the file as described in the following example. (The `xSxxx` portion of the file name varies with the version of Resource Manager 9200):

   Example:

   ```
   tar xvf ArrayManage-xHxxx-CLI.tar
   ```

The new version of Resource Manager 9200 will be installed. AIX does not need to be restarted.

1.6 Uninstalling

This section provides instructions for uninstalling Resource Manager 9200 on the following systems:

- Windows®
- Solaris™, IRIX®, HP-UX®, and AIX®

1.6.1 Windows®

1. Delete the Resource Manager 9200 using the Add and Delete Application icon in the Control Panel.
2. Delete the directory generated in the hard disk for installing the Resource Manager 9200.

1.6.2 Solaris™, IRIX®, HP-UX®, and AIX®

1. Delete the directory and all its files generated in the hard disk for installing the Resource Manager 9200.
2. Delete the statement of a path to the common library from the set contents of the environment variable.
3. Delete the reference to the CMDF_ROOT_DIR_PATH environment variable.

Chapter 2 Command List

2.1 Command List

Table 2.1 shows a list of Resource Manager 9200 commands. There are two types of Resource Manager 9200 commands: one type is the standard command that is used in standard mode; the other is the administration command that is used in administration mode.

When executing an administration command, a password must be set and entered. This password is for the workstation from which the commands are executed. It is stored in a password file on this workstation. (See Array Unit Registration Commands.) The administration commands that require password entry are shown with symbols "○" marked in the password column of Table 2.1. These commands can be either used or not while the array unit is online. (Commands that can be used during online are shown each with symbols "○" marked in the online use column in Table 2.1.)

Additionally, when the optional Password Protection function is installed on the array unit, some commands cannot be executed unless a user ID and password is provided. These user Ids and passwords are stored on the array unit. (See Array Unit Management by User ID Commands.) The commands that require login if a user ID has been registered are shown with symbols "○" marked in the login column of Table 2.1.

Table 2.1 List of Resource Manager Commands

Classification	Function	Command	Online use	Password	Login
Array unit registration	Referencing array unit information	auunitref	○	×	×
	Adding array unit information	auunitadd	○	×	×
	Changing array unit information	auunitchg	○	×	×
	Deleting array unit information	auunitdel	○	×	×
	Setting password	aupasswd	○	○	×
Array unit management by user ID	Setting user ID	auuidadd	○	○	○
	Changing user ID	auuidchg	○	○	○
	Deleting user ID	auuiddel	○	○	○
	Changing password	aupwdchg	○	○	○
	Logging into array unit	aulogin	○	○	×
	Logging out from array unit	aulogout	○	○	○
	Checking login	auchkuid	○	×	○

Table 2.1 List of Resource Manager Commands (Continued)

Classification	Function	Command	Online use	Password	Login
Array unit status	Displaying microprogram revision	aurev	○	×	×
	Displaying drive configuration information	audrive	○	×	×
	Displaying cache configuration information	aucache	○	×	×
	Displaying status of power supply/fan/battery	ausupply	○	×	×
	Displaying current IP address	aucrlan	○	×	×
	Displaying the information messages	auinfomsg	○	○	○
RAID /LU	Referencing RAID group	aurgref	○	×	×
	Setting up RAID group	aurgadd	○	○	○
	Expanding RAID group	aurgexp	○	○	○
	Deleting RAID group	aurgdel	×	○	○
	Referencing LU	auluref	○	×	×
	Setting up LU	auluadd	○	○	○
	Formatting LU	auformat	○	○	○
	Displaying progress of LU formatting	auformatst	○	○	×
	Expanding LU	auluexp	○	○	○
	Deleting LU	auludel	×	○	○
	Changing default controller of LU	auluchg	○	○	○
	Setting turbo LU (See Note 1.)	auturbolu	○	○	○
	Referencing unified LU	aumluref	○	×	×
	Unifying LU	aulumrg	○	○	○
	Dividing LU	aumludiv	○	○	○
System parameters	Referencing/setting system parameters (See Note 1.)	ausysparam	×	○	○
	Referencing/setting RTC (See Note 1.)	aurtc	×	○	○
	Referencing/setting target information (See Note 1.)	autarget	○	○	○
	Referencing/setting LAN information (See Note 1.)	aulan	○	○	○

Table 2.1 List of Resource Manager Commands (Continued)

Classification	Function	Command	Online use	Password	Login
System parameters (continued)	Referencing/setting SCSI transfer rate (See Note 1.)	ausync	○	○	○
	Referencing/setting port option	auportop	○	○	○
	Referencing/setting target information during on-line	auontarget	○	○	○
Setting up configuration	Referencing/setting fibre channel information	aufibre aufibrel	×	○	○
	Spare HDU setup	auspare	○	○	○
	Referencing/setting Fee-Basis option	auopt	○	○	○
	Referencing/setting drive restoration control information	audrecopt	×	○	○
	Referencing/setting online verify information	auonlineverify	×	○	○
	Referencing/setting ShadowImage 9200 information	aumrcfdev	○	○	○
	Displaying coupled- LU of ShadowImage 9200	aumrcfluc	○	○	○
	Referencing/setting Command device information	aucmddev	○	○	○
Rebooting	Rebooting array unit	aureboot	×	○	○
Setting up remote path	Referencing/setting remote path	aumtpath	○	○	○
File output of the RAID/LU configuration information	Save the RAID/LU configuration information and component conditions in file	auconfigout	○	×	×
RAID/LU configuration setup in file	RAID/LU configuration setup from file	auconfigset	○	○	○
File output of system parameter	Save system parameter in file	ausyspout	○	×	×
System parameter setup in file	System parameter setup from file	ausyspset	○	○	○
Microprogram replacement	Downloading/replacing microprogram	aumicro	×/○	○	○
SNMP environment information	Setting SNMP environment information and storing in file (See Note 1.)	ausnmp	×/	○	○
Displaying statistical information	Displaying statistical information	austatistics	○	×	×

Table 2.1 List of Resource Manager Commands (Continued)

Classification	Function	Command	Online use	Password	Login
Obtaining performance information	Outputting performance information file	auperform	○	×	×
Monitoring errors	Setting up E-Mail reports	aumail	○	×	×
	Setting additional information on E-Mail	auunitmsg	○	×	×
	Setting the starting of application	auextprog	○	×	×
	Monitoring errors	auerroralert	○	×	×
Help	Displaying command help	auman	○	×	×

Note 1: Set items do not become effective until the array unit is restarted. However, when connecting the Resource Manager 9200, restarting is not necessary.

Note 2: For information on password protection, refer to the *Hitachi Thunder 9200™ Password Protection User's Guide* (MK-90DF528).

For Commands that require login, if the reference is specified by the option, they can be executed without logging in.

Chapter 3 Command Specifications

This chapter contains the following Resource Manager 9200-command information:

- Command Format
- Registering an Array Unit
- Array Unit Management by User ID
- Displaying Array Unit Status
- RAID/LU
- Setting UP Configuration
- System Parameters
- File Output of Configuration and Configuration Setting by File
- Microprogram Replacement
- SNMP Environment Information
- Displaying Statistical Information
- Obtaining Performance Information
- Monitoring Errors

3.1 Command Format

The command format of the Resource Manager 9200 is specified with a command name and succeeding options as shown in Figure 3.1. 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.

```
Command  Option1  Option2  Option3 ....
```

Figure 3.1 Command Format of Resource Manager

Commands of the Resource Manager 9200 are classified mainly into the standard command and the administrator commands. The following describes specifications of each type of command.

3.1.1 Standard Command

The standard command is a command used mainly for reference. Figure 3.2 and Figure 3.3 show the formats of the standard command. When executing a standard command, the execution result will be displayed following its execution. If an error is detected in specification of options or while processing, you are notified of an error message.

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

Figure 3.2 Format of Standard Command (when terminating normally)

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

Figure 3.3 Format of Standard Command (when an error is detected)

3.1.2 Administration command

The administration command is a command used to set up a configuration for the array unit. Taking into consideration the integrity and security of data, this command prompts you to enter a password when executing it, and is executed if the password can be authenticated. When option -refer is specified, for example in command aufibre a password is not required.

Figure 3.4 and Figure 3.5 show the formats of the administration command. When entering an administrator command, this command prompts you to enter a password following the entry. This time, when you enter a preset password, the command will be executed. When, in particular, performing operations associated with data configurations such as deletion of a RAID group or logical unit, commands prompt you to confirm whether or not to execute the function itself before entering a password (see Figure 3.5).

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

Figure 3.4 Format 1 of Administration Command

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

Figure 3.5 Format 2 of Administration Command

3.1.3 Referencing Command Syntax

When you want to reference the syntax of a command, specify the -help option in the command, then the Usage information will be displayed, as shown in Figure 3.6. The descriptions displayed in Usage are the same as those described in **Format** of each command.

```
% auunitadd –help
Disk Array management program
Version 5.71
Copyright (C) 2000, 2002, Hitachi, Ltd.

Usage:
auunitadd  -unit unit_name [ -group group_name ]  -DF350 | -DF400 | -DF500
           -single | -dual
           -RS232C | -LAN
           [ -ctl0 device | address ] [ -ctl1 device | address ] [ -watch ]
%
```

Figure 3.6 Example of Referencing Command Syntax

3.1.4 Command List

A command list is displayed when **auhlep.bat** is activated.

Command	Function	Command	Function
auunitref	— Display Array Unit Information	aumrcfluc	— Refer Coupling LU Information
auunitadd	— Add Array Unit Information	aurmtpath	— Set Remote Path Information
auunitchg	— Change Array Unit Information	ausysparam	— Set System Parameter
auunitdel	— Delete Array Unit Information	auportop	— Set Port Option Parameter
aupasswd	— Set Password	aurtc	— Set RTC
auman	— Display reference manual pages	autarget	— Set Target Information
auuidadd	— Add User ID to the array unit	auontarget	— Set LU Mapping Information
auuidchg	— Change User ID on the array unit	aulan	— Set LAN Information
auuiddel	— Delete User ID on the array unit	ausync	— Set Sync Control Information
aupwdchg	— Change password on the array unit	auspare	— Set Spare Disk
aulogin	— Login the array unit	audrecopt	— Set Drive Restoration Information
aulogout	— Logout the array unit	auonlineverify	— Set Online Verify Information
auchkuid	— Refer User ID logged in the array unit	aufibre,aufibre1	— Set Fibre Channel Information
aurev	— Display Microprogram Revision	aumicro	— Download/Change Microprogram
audrive	— Display Drive Configuration	ausnmp	— Set SNMP Configuration
aucache	— Display Cache Configuration	aureboot	— Restart the array unit
ausupply	— Display Power Supply/FAN/Battery/AC/DC Information	austatistics	— Display Statistical Information
		auperform	— Output Performance Information to File
aucrlan	— Display Current IP Address	auinfomsg	— Display Information Message
aurgref	— Display RAID Group Configuration	aumail	— Set E-mail Information
aurgadd	— Add RAID Group	auunitmsg	— Set E-mail Additional Information
aurgexp	— Expand RAID Group	auextprog	— Set External Application Information
aurgdel	— Delete RAID Group	auerroralert	— Error Alert
auluref	— Display LU Configuration	auopt	— Option set up
auluadd	— Add LU	ausyspout	— Output System Parameter to File
auformat	— Format LU	auconfigout	— Output RG/LU Configuration to File
auformatst	— Refer Format Progress	ausyspset	— Set System Parameter from File
auluexp	— Expand LU Capacity	auconfigset	— Set RG/LU Configuration from File
auludel	— Delete LU	aumluref	— Refer Unified LU Information
auluchg	— Change Default Controller of LU	aulumrg	— Unify LU
auturbolu	— Set Turbo LU	aumludiv	— Separate Unified LU
aucmddev	— Set Command Device Information		
aumrcfdev	— Set Command Device Information		

Figure 3.7 Command List

3.1.5 Command Help

When each command of the Resource Manager 9200 is activated by an **auman** command, commentaries of each command described in this manual are displayed.

A format of **auman** is shown in the following.

- Command name

  ```
  auman [ -en | -jp ] command_name
  ```

- Options

Options	Description
-en | -jp	Specifies the locale of the manual when the specification is omitted. If the environment variable "LANG" indicates Japanese, the manual is displayed in Japanese. If the environment variable indicates the other locale, the manual is displayed in English. -en: Displays the manual in Japanese. -jp: Displays the manual in English.
command_name	Specifies the command name that the manual displays.

- Examples

  The following example is displayed in auunitref command help.

  Example:

```
% auman –en auunitref
Copyright (C) 2000, 2001, Hitachi, Ltd.

Command name

    auunitref    Displaying the Registration Information

Format
    auunitref  [ -unit unit_name ]

Description
    This command displays the registration information of an array unit that
    is registered in Disk Array management program.
    Omitting the array unit name displays a list of information registered
    in the Disk Array management program.
    Specifying an array unit name displays information about the specified
    array unit.

Options
    -unit unit_name
            Specifies the name of an array unit whose registration
            information is to be referred.
            Specify the array unit in less than or equal to 16 characters
            using alphanumerics, special symbols "-(minus)", or
            "_(underline)".
%
```

Figure 3.8 Example of Command Help

3.2 Registering an Array Unit

3.2.1 Displaying Registration Information

- Command name

  `auunitref`

- Format

  `auunitref  [ -unit unit_name ]`

- Description

  This command displays the registration information of an array unit that is registered in the Resource Manager 9200. Omitting an array unit name, displays a list of information registered in the Resource Manager 9200. When an array unit name is specified, information is displayed about the specified array unit.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit whose registration information is to be referenced. Specify the array unit in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".

- Examples

  The following example references all registered information.

Example:

```
% auunitref
Array Unit Name   Group Name   Array Unit Type   Error Alert   Connection Mode   IP Address/Host
Name/Device Name
df350a                         DF350 Dual        on            LAN               192.168.33.120
192.168.33.130
df400a            hsp          DF400 Dual        on            LAN               192.168.0.50
192.168.0.51
df400a0           hsp          DF400 Single      on            LAN               192.168.0.60
df400a1           hsp          DF400 Dual        off           LAN               192.168.0.62
192.168.0.63
df400b1           hsp1         DF400 Dual        on            LAN               192.168.1.100
192.168.1.101
df400b2           hsp1         DF400 Dual        off           LAN               192.168.1.102
192.168.1.103
df400c1           hsp1         DF400 Single      off           232C              COM1
df500a1           hsp1         DF500 Dual        on            LAN               192.168.2.100
192.168.2.101
df500a2           hsp1         DF500 Dual        on            LAN               192.168.2.102
192.168.2.103
%
```

The following example references registration information of array unit df500a1.

Example:

```
% auunitref  -unit df500a1
Array Unit Name   Group Name   Array Unit Type   Error Alert   Connection Mode   IP Address/Host
Name/Device Name
df500a1           hsp1         DF500 Dual        on            LAN               192.168.0.100
192.168.0.101
%
```

3.2.2 Registering

- Command name

  auunitadd

- Format

```
auunitadd  -unit unit_name  [ -group group_name ]  -DF350 | -DF400 | -DF500
           -single | -dual
           -RS232C | -LAN
           [ -ctl0 device | address ]  [ -ctl1 device | address ]  [ -watch ]
```

- Description

  This command registers an array unit into the Resource Manager. Registration information consists of an array unit name, a group name, a type, a configuration, a connection interface, and device.

- Format

  – Single system

```
auunitadd  -unit unit_name [ -group group_name ] -DF350 | -DF400 | -DF500
       -single -RS232C | -LAN
       -ctl0 device | address [ -watch ]
```

  – Dual system

```
auunitadd  -unit unit_name [ -group group_name ] -DF350 | -DF400 | -DF500
       -dual -RS232C | -LAN
       -ctl0 device | address [ -ctl1 device | address ] [ -watch ]
```

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit whose registration information to set up. Specifies with one-byte coded alphanumeric and special symbols "- (minus)" and "_(underline)" of up to 16 characters long.
`-group group_name`	Specifies 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. Specifies with one-byte coded alphanumeric and special symbols "- (minus)" and "_(underline)" of up to 16 characters long.
`-DF350 | -DF400 | -DF500`	Specifies the type of an array unit.
`-single | -dual`	Specifies the configuration (single system or dual system) of an array unit.
`-RS232C | -LAN`	Specifies the connection interface (RS232C or LAN) to an array unit.
`-ctl0 device | address`	Specifies the device or address used to connect to Controller 0. If "LAN" is selected as the [connection interface], specifies an "IP address" or "host name". If "RS232C", specifies a "device name". Specifies a host name with up to 15 one-byte coded characters. Specifies a device name with a RS232C port name or a device file name. (Example: Windows - COM1, Solaris - /dev/ttya)
`-ctl1 device | address`	Specifies the device or address used to connect to Controller 1. If "LAN" is selected as the [connection interface], specifies an "IP address" or "host name". If "RS232C", specifies a "device name". Specifies a host name with up to 15 one-byte coded characters. Specifies a device name with a RS232C port name or a device file name. (Example: Windows - COM1, Solaris - ttya)
`-watch`	Specifies that an array unit registered is monitored for errors. If omitted, an array unit is not monitored for errors.

Note: For the dual system disk array unit, only one controller can be used in the LAN connection mode. **Array Unit Type** is used to select an array unit type to be connected. Specify **Controller/IP Address/Host Name/Device Name** and **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.

- Examples:

  The following example registers a 9200 with a dual system configuration and a LAN connection interface by an array unit name of df500a1.

  Example:

```
% auunitadd  -unit-df500a1  -DF500  -dual  -LAN  -ctl0 192.168.1.100  -ctl1
192.168.1.101
%
```

3.2.3 Changing Registration Information

- Command name

  ```
  auunitchg
  ```

- Format

  ```
  auunitchg  -unit unit_name
             [ -newunit unit_name ]  [ -group group_name ]
             [ -DF350 | -DF400 | -DF500 ]  [ -single | -dual ]
             [ -RS232C | -LAN ]
             [ -ctl0 device | address ]  [ -ctl1 device | address ]
             [ -watch | -ignore ]  [ -f ]
  ```

- Description

  This command changes the registration information (array unit name, group name, type, configuration, connection interface, and device) of an already-registered array unit. However, omitted items will not be changed.

- Options

Options	Description
`-unit unit_name`	Specifies the name of a registered array unit. Specifies with one-byte coded alphanumeric and special symbols "- (minus)" and "_(underline)" of up to 16 characters long.
`-newunit unit_name`	Specifies the array unit name to change. Specifies an array unit name after change, with one-byte coded alphanumeric and special symbols "- (minus)" and "_(underline)" of up to 16 characters long.
`-group group_name`	Specifies the group name to change. Specifies with one-byte coded alphanumeric and special symbols "- (minus)" and "_(underline)" of up to 16 characters long.
`-DF350 | -DF400 | -DF500`	Specifies the type of an array unit to change.
`-single | -dual`	Specifies the configuration (single system or dual system) of an array unit to change.
`-RS232C | -LAN`	Specifies the connection interface (RS232C or LAN) of an array unit to change.
`-ctl0 device | address`	Specifies the device or address to change, which address is used to connect to Controller 0. If the [connection interface] is "LAN", specifies an "IP address" or "host name". If "RS232C", specifies a "device name". Specifies a host name with up to 15 one-byte coded characters. Specifies a device name with a RS232C port name or a device file name. (Example: Windows - COM1, Solaris - /dev/ttya)

(Continued)

Options	Description
-ctl1 device | address	Specifies the device or address to change, which address is used to connect to Controller 1. Specifies in the same way as for Controller 0.
-watch	Specifies that an array unit is monitored for errors.
-ignore	Specifies that an array unit is not monitored for errors.
-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 array unit df500a1, 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.

  Example:

```
% auunitref  -unit df500a1
Array Unit Name   Group Name   Array Unit Type   Error Alert   Connection Mode   IP
Address/Host Name/Device Name
df500a1           hsp          DF500 Dual        on            232C          /dev/ttya
%
% auunitchg  -unit df500a1  -LAN  -ctl0 192.168.1.100  -ctl1 192.168.1.101
change df500a1? (y/n [n]): y
%
% auunitref  -unit df500a1
Array Unit Name   Group Name   Array Unit Type   Error Alert   Connection Mode   IP
Address/Host Name/Device Name
df500a1           hsp          DF500 Dual        on            LAN
192.168.1.100   192.168.1.101
%
```

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

  Example:

```
% auunitchg  -unit df500b1
DMEA001003 : The specified subsystem name is not registered.
%
```

3.2.4 Deleting Registration Information

- Command name

  `auunitdel`

- Format

  `auunitdel -unit unit_name [ -f ]`

- Description

  This command deletes the registration information of an already-registered array unit.

- Options

Options	Description
`-unit unit_name`	Specifies the name of a registered array unit whose registration information is to be deleted. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-f`	Omits the confirmation message when the command is executed.

- Examples:

  The following example deletes registration information of already-registered array unit df500a1.

  Example:

```
% auunitdel -unit df500a1
remove df500a1? (y/n [n]): y
%
```

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

  Example:

```
% auunitdel -unit df500b1
DMEA001003 : The specified subsystem name is not registered.
%
```

3.2.5 Setting a Password in Administration Mode

- Command name

  aupasswd

- Format

  aupasswd

- Description

  This command sets a new password used in administration mode to execute administration commands. This command is also used to change an already-set password.

  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.

- Examples:

  The following example sets a new password used in administration mode.

  Example:

```
% 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.

  Example:

```
% aupasswd
Old password: (Enters an already-set password.)
New password: (Enters a new password.)
Retype new password: (Enters the same password as above.)
%
```

3.3 Array Unit Management by User ID

3.3.1 Setting a User ID

- Command name

  auuidadd

- Format

  auuidadd -unit unit_name [-num]

- Description

  This command registers a user ID and its password into an array unit. 20 users can be registered at maximum. Specify the user ID and the password from 4 to 12 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".

  After the registration, the number of the users that are registered will be displayed.

  Note: Optional Password Security software must be installed on the array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit into which to register a user ID. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
-num	Displays the number of registered user IDs.

- Examples:

  The following example adds a user ID into array unit df400a1.

  Example:

```
% auuidadd -unit df400a1
Password:
User ID for array unit: (User ID to set)
Password for array unit: (Password of a user ID to set)
Retype Password for array unit: (Same password as that of a user ID to set)
Number of registered User ID: n
%
```

  The following example displays the number of user IDs already-registered in array unit df400a1.

  Example:

```
% auuidadd -unit df400a1 –num
Password:
Number of registered User ID: n
%
```

3.3.2 Changing a User ID

- Command name

  auuidchg

- Format

  auuidchg -unit unit_name

- Description

  This command changes a user ID that has been set up in an array unit.
  After changing the user ID, the number of user IDs that are set up in the array unit will be displayed.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which the user ID is to be changed. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".

- Examples:

  The following example changes a user ID that has been registered in array unit df400a1.

  Example:

```
% auuidchg  -unit df400a1
Password:
Old User ID for array unit: (Already-set user ID)
Old Password for array unit: (Password of an already-set user ID)
New User ID for array unit: (User ID to set)
New Password for array unit: (Password of a user ID to set)
Retype New Password for array unit: (Same password as that of a user ID to set)
Number of registered User ID: n
%
```

3.3.3 Deleting a User ID

- Command name

  `auuiddel`

- Format

  `auuiddel -unit unit_name`

- Description

  This command deletes a user ID that has been set up in an array unit. After deleting the user ID, the number of user IDs are set in the array unit will be displayed.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit in which the user ID is to be deleted. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".

- Examples:

  The following example deletes a user ID that has been registered in array unit df400a1.

  Example:

```
% auuiddel  -unit df400a1
Password:
User ID for array unit: (Already-set user ID)
Password for array unit: (Password of an already-set user ID)
Number of registered User ID: n
%
```

3.3.4 Changing a Password

- Command name

  aupwdchg

- Format

  ```
  aupwdchg  -unit unit_name
  ```

- Description

  This command changes the password of a user ID that has been set up in an array unit. After changing the password, the number of user IDs that are set in the array unit will be displayed.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which the password of a user ID is to be changed. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".

- Examples:

  The following example changes the password of a user ID that has been registered in array unit df400a1.

  Example:

```
% aupwdchg  -unit df400a1
Password:
User ID for array unit: (Already-set user ID)
Old Password for array unit: (Password of an already-set user ID)
New Password for array unit: (Password of a user ID to set)
Retype New Password for array unit: (Same password as that of a user ID to set)
Number of registered User ID: n
%
```

3.3.5 Logging In and Forcibly Logging into an Array Unit

- Command name

  `aulogin`

- Format

  `aulogin -unit unit_name [ -discon ]`

- Description

  This command declares an intention to log into an array unit with a user ID registered in the array unit. Using this command disables any other user ID to log in. When you want to log in forcibly to an array unit which other user has already been logged in, specify the `-discon` option. When forcibly logged in, an already logged-in user will be logged out.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit to which to log in. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-discon`	Specify this option when forcibly logging into an array unit to which another user has already logged in.

- Examples:

  The following example logs into array unit df400a1, using an already registered user ID.

  Example:

```
% aulogin  -unit df400a1
Password:
User ID for array unit: (Already-set user ID)
Password for array unit: (Password of an already-set user ID)
%
```

The following example logs in with a registered user ID to array unit df400a1 and to which another user has logged in.

Example:

```
% aulogin  -unit df400a1  -discon
Password:
User ID for array unit: (Already-set user ID)
Password for array unit: (Password of an already-set user ID)
User ID (xxxxxxxxxxxx) has been logged in.
Connected with (xxx.xxx.xxx.xxx). (See Note)
Do you want to forcibly log in? (y/n [n]): y
%
```

No option is offered to log in forcibly since the user peter has logged in with the option -discon

Note: Destination of connection is indicated as *Connected with* (xxx.xxx.xxx.xxx). xxx indicates the IP address for connection via LAN, and the destination of connection is indicated as *Connected with (RS232C)* for the connection via RS232C.

3.3.6 Logging Out from an Array Unit

- Command name

  `aulogout`

- Format

  `aulogout  -unit unit_name`

- Description

  This command logs out a user ID with which a user has already logged into an array unit.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit from which the user ID is to be logged out. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".

- Examples:

  The following example logs out a user ID with which a user has logged into array unit df400a1.

  Example:

```
% aulogout  -unit df400a1
Password:
%
```

3.3.7 Checking Login

- Command name

  auchkuid

- Format

  auchkuid -unit unit_name

- Description

  This command checks to see who (user ID) is logging into the array unit and the connected destination. The connected destination is an IP address for LAN connection, and "RS232C" for RS232C connection.

  This command can be used and information can be referred by users that have not logged in yet. If an already logged in user executes this command, the user information cannot be referenced.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit whose login status to check. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".

- Examples:

  The following example checks the user ID who has logged into array unit df400a1.

  Example:

```
% auchkuid  -unit df400a1
User ID (xxxxxxxxxxxx) has been logged in.
Connected with (xxx.xxx.xxx.xxx). (See Note)
%
```

Note: The destination of connection is indicated as *Connected with (xxx.xxx.xxx.xxx)*. xxx indicates the IP address for connection via LAN, and the destination of connection is indicated as *Connected with (RS232C)* for the connection via RS232C.

3.4 Displaying Array Unit Status

3.4.1 Displaying a Microprogram Revision

- Command name

  `aurev`

- Format

  `aurev -unit unit_name [ -ctl0 | -ctl1 ]`

- Description

  This command displays the microprogram revision of a specified unit.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit for which to display its microprogram revision. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-ctl0 | -ctl1`	Specifies the controller number of a specified array unit.

- Examples:

  The following example displays the microprogram revision of array unit df500a1.

  Example:

```
% aurev  -unit df500a1
Serial Number: 0777
Microprogram Revision: 0557
%
```

3.4.2 Displaying Drive Configuration Information

- Command name

  audrive

- Format

  – 9200:

  ```
  audrive  -unit unit_name  -status [ -uno unit_no  -hno hdu_no ]
  ```

  – 9200:

  ```
  audrive  -unit unit_name  -vendor
  ```

- Description

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

  If an HDU on which data restoration is in progress is specified, a process of restoring is displayed.

- Options

Options	Description
-unit unit_name	This command specifies the name of an array unit which its drive configuration information is to be displayed. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
-status | -vendor	The drive information is displayed. **-status:** The drive condition is displayed. **-vendor:** The vendor ID, product ID, and revision of the mounted drive are displayed. For the DF500, the storage capacity of drives is displayed.

9200:

Options	Description
-uno unit_no -hno hdu_no	Displays the operating status of the drive at a specified position. In addition, if the drive is a data drive subject to data recovery, the following information is displayed additionally. 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.

- Examples:

  The following example displays the status of drives in array unit df400a1.

  Example:

```
% audrive  -unit df400a1  -status
Port   Row   Type       Physics   Status
0      0     Data       Mounted   Normal
1      0     Data       Mounted   Normal
2      0     Data       Mounted   Normal
3      0     Data       Mounted   Normal
4      0     Data       Mounted   Normal
5      0     Spare      Mounted   Standby
0      1     Data       Mounted   Normal
1      1     Data       Mounted   Standby
2      1     Undefined  Mounted   Out of RG
3      1     Undefined  Mounted   Out of RG
4      1     Undefined  Mounted   Out of RG
%
```

  The following example displays the status of drives in array unit df500a1.

  Example:

```
% audrive  -unit df500a1  -status
Unit No.   HDU No.   Type        Physics   Status
0          0         Data        Mounted   Normal
0          1         Data        Mounted   Normal
0          2         Data        Mounted   Normal
           :
           :
0          8         Data        Mounted   Normal
0          9         Spare       Mounted   Standby
1          0         Undefined   Mounted   Out of RG
1          1         Undefined   Mounted   Out of RG
           :
           :
1          8         Undefined   Mounted   Out of RG
1          9         Undefined   Mounted   Out of RG
    :
    :
%
```

The following example displays the status of drive HDU No. 7 in UNIT No. 0 of array unit df500a1.

Example:

```
% audrive  -unit df500a1  -status -uno 0 -hno 7
Unit No.   HDU No.   Type   Physics   Status
0          7         Data   Mounted   Reconst(75%)
```

The following example displays the drive information of array unit df400a1.

Example:

```
% audrive  -unit df400a1  -vendor
Port   Row   Vendor   Product   Revision
0      0     HITACHI  DK328-43   D0D4
1      0     HITACHI  DK328-43   D0D4
2      0     HITACHI  DK328-43   D0D4
3      0     HITACHI  DK328-43   D0D4
4      0     HITACHI  DK328-43   D0D4
%
```

The following example displays the drive information of array unit df500a1.

Example:

```
% audrive  -unit df500a1  - vendor
Unit No.   HDU No.   Vendor   Product    Revision   Capacity
0          0         HITACHI   DK328-43   D0D4      18GB
0          1         HITACHI   DK328-43   D0D4      18GB
0          2         HITACHI   DK328-43   D0D4      18GB
           :
           :
0          8         HITACHI   DK328-43   D0D4      18GB
0          9         HITACHI   DK328-43   D0D4      18GB
1          0         HITACHI   DK328-43   D0D4      18GB
1          1         HITACHI   DK328-43   D0D4      18GB
           :
           :
%
```

3.4.3 Displaying Cache Configuration Information

- Command name

  aucache

- Format

  ```
  aucache  -unit unit_name
  ```

- Description

  This command displays the status and capacity of cache memory.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit for which to display cache configuration information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols “- (minus)”, or “_ (underline)”.

- Examples:

  The following example displays the cache memory configuration information of array unit dff400al:

  Example:

```
% aucache  -unit df400a1
Ctl   Slot  Status         Size (MB)
0     0     Normal         32
0     1     Detached       --------
0     2     Normal         --------
0     3     Not installed  --------
0     4     Not installed  --------
0     5     Not installed  --------
0     6     Not installed  --------
0     7     Not installed  --------
0     8     Not installed  --------
0     9     Not installed  --------
0     10    Not installed  --------
0     11    Not installed  --------
0     12    Not installed  --------
0     13    Not installed  --------
0     14    Not installed  --------
0     15    Not installed  --------
1     0     Normal         32
1     1     Detached       --------
1     2     Normal         --------
1     3     Not installed  --------
1     4     Not installed  --------
1     5     Not installed  --------
1     6     Not installed  --------
1     7     Not installed  --------
1     8     Not installed  --------
1     9     Not installed  --------
1     10    Not installed  --------
1     11    Not installed  --------
1     12    Not installed  --------
1     13    Not installed  --------
1     14    Not installed  --------
1     15    Not installed  --------
%
```

3.4.4 Displaying the Status of Power Supply/Fan/Battery/Loop/ENC

- Command name

  `ausupply`

- Format

  `ausupply -unit unit_name`

- Description

  This command displays the status of AC power supplies, fans, batteries, battery backup circuits, loop, and ENC.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit for which to display information. Specify the name in less than or equal to 16 characters using alphanumeric characters and special symbols "- (minus)" and "_ (underline)".

- Examples of using commands:

  This example displays the status of power supplies, batteries, fans, backup circuits, loop, and ENC of array unit df400a1 individually.

Example:

```
% ausupply  -unit df400a1
AC PS Information
Unit  AC    Status
0     0     Normal
0     1     Normal
1     0     Nothing
1     1     Nothing
2     0     Nothing
2     1     Nothing
:
:
9     0     Nothing
9     1     Nothing

FAN Information
No.   Status
0     Normal
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
1     0     Normal
1     1     Normal

ENC Information
Unit  ENC   Status
0     0     Normal
0     1     Normal
1     0     Nothing
1     1     Nothing
2     0     Nothing
2     1     Nothing
:
:
9     0     Nothing
9     1     Nothing
%
```

3.4.5 Displaying the Current IP Address

- Command name

  aucrlan

- Format

  aucrlan -unit unit_name

- Description

  This command displays the enabled LAN information of the array unit. For the 9200, the IP address, the subnet mask, and the default gateway address are displayed.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to display LAN information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".

- Examples:

  The following example displays the enabled LAN information of array unit df400a1.

  Example:

```
% aucrlan  -unit df400a1
CTL   IP Address     Subnet Mask
0     125.0.9.98     255.255.255.0
1     125.0.9.99     255.255.255.0
%
```

  The following example displays the enabled LAN information of array unit df500a1.

  Example:

```
% aucrlan  -unit df500a1
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
%
```

3.4.6 Displaying the Information Messages

- Command name

  `auinfomsg`

- Format

  `auinfomsg -unit unit_name`

- Description

  This command obtains and displays the Information Messages of the specified array unit.

- Options

Options	Description
`-unit unit_name`	Specifies the name of the array unit in which the Information Messages are to be obtained. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".

- Examples

  The following example obtains and displays the Information Messages on array unit df500a1.

  Example:

```
% auinfomsg -unit df500a1
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.
%
```

3.5 RAID/LU

3.5.1 Referencing a RAID Group

- Command name

  `aurgref`

- Format

  `aurgref  -unit unit_name`

- Description

  This command displays a list of definition of the RAID groups set to the array unit. The displayed contents include the RAID group number, RAID level, and the definition frame of the RAID group.

- Options

Options	Description
`-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 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-m`	Specify this option when expressing the residual capacity in Mbytes. When the specification is omitted, the capacity is expressed in blocks.

- Examples:

  The following example references the definition of the RAID group of array unit df400a1.

  Example:

```
% aurgref  -unit df400a1
RG   Level   Port   Width   Row   Depth
0    5       0      5       0     1
2    0       0      3       1     1
3    1       0      4       2     1
%
```

  The following example references the definition of the RAID group of array unit df500a1.

  Example:

```
% aurgref  -unit df500a1 –m
RAID   RAID   Start Location      Number of HDU    Number of     Remains
Group  Level  [Unit No, HDU No.]  in parity group  parity group  [Mbyte]
0      5      0         5         0                1             135563
%
```

3.5.2 Setting Up a RAID Group

- Command name

  aurgadd

- Format

  – 9200:

```
aurgadd  -unit unit_name  -rg rg_no
         -RAID0 | -RAID1 | -RAID5 | -RAID01
         -uno unit_no  -hno hdu_no  -hnum hdu_num  -pnum pty_num
```

- Description

  This command sets up a RAID group in a specified array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which to set up a RAID group. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
-rg rg_no	Specifies the RAID group number.
-RAID0, -RAID1, -RAID5, -RAID01, -RAIDB, -RAIDC	Specifies the RAID level.

9200:

Options	Description
-uno unit_no	Specifies the Unit No. of the top drive in a RAID group.
-hno hdu_no	Specifies the HDU No. of the top drive in a RAID group.
-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.

- Examples:

  The following example sets up a RAID group in array unit df400a1 (DF400). Set RAID group number to 2, RAID level to RAID5, starting drive Port to 0, Row to 2, Width to 5, and Height to 1.

  Example:

```
% aurgadd  -unit df400a1  -rg 2  -RAID5  -port 0  -row 2  -width 5  -depth 1
Password:
%
```

  The following example sets up the RAID group of array unit df500a1. Set RAID group number to 2, RAID level to RAID5, starting drive Unit number to 0, HDU number to 2, number of HDUs in the parity group to 5, number of parity groups to 1.

  Example:

```
% aurgadd  -unit df500a1  -rg 2  -RAID5  -uno 0  -hno 0  -hnum 5  -pnum 1
Password:
%
```

3.5.3 Expanding a RAID Group

- Command name

  aurgexp

- Format
  - 9200:

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

- Description

  This command expands the already-defined size of a RAID group.

- Options

Options	Description
-unit unit_name	Specifies 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 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
-rg rg_no	Specifies the RAID group number of a RAID group which is to be expanded.

9200:

Options	Description
-pnum pty_num	Specifies the number of parity groups after expansion.

- Examples:

  The following example expands the depth of RAID group 2 (from 1 to 3), which has been set up in array unit df400a1.

  Example:

```
% aurgref  -unit df400a1
RG  Level  Port  Width  Row  Depth
2   5      0     5      0    1
%
% aurgexp  -unit df400a1  -rg 2  -depth 3
Password:
%
% aurgref  -unit df400a1
RG  Level  Port  Width  Row  Depth
2   5      0     5      0    3
%
```

  The following example expands the number of parity groups of RAID group 0 (from 1 to3), which number has been set in array unit df500a1.

  Example:

```
% aurgref  -unit df500a1
RAID   RAID   Start Location      Number of HDU    Number of     Remains
Group  Level  [Unit No. HDU No.]  in parity group  parity group  [block]
0      5              0       5   0                1             10000000
%
% aurgexp  -unit df500a1  -rg 0  -pnum 3
Password:
%
% aurgref  -unit df500a1
RAID   RAID   Start Location      Number of HDU    Number of     Remains
Group  Level  [Unit No. HDU No.]  in parity group  parity group  [block]
0      5              0       5   0                3             30000000
%
```

3.5.4 Deleting a RAID Group

- Command name

  `aurgdel`

- Format

  ```
  aurgdel  -unit unit_name  -rg rg_no [ -f ]
  aurgdel  -unit unit_name  -ALL [ -f ]
  ```

- Description

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

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit in which the RAID group to be deleted is defined. Specify less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-rg rg_no`	Specifies the RAID group number of a RAID group which is to be deleted.
`-ALL`	Deletes all RAID groups.
`-f`	Omits the confirmation message when the command is executed.

- Examples:

  The following example deletes RAID group 1 that has been defined in array unit df400a1.

  Example:

```
% aurgdel  -unit df400a1  -rg 1
Logical unit exits in the RAID group.
Are you sure you want to delete the specified RAID group? (y/n [n]): y
If you delete the RAID group, all logical units will be deleted and the user data will
also be invalid.
Are you sure you want to delete the RAID group? (y/n [n]): y
User data that are invalid due to deleting a RAID group cannot be recovered.
Are you sure you want to delete the RAID group? (y/n [n]): y
Password:
%
```

The following shows an example of attempting to delete all RAID groups that are defined in array unit df400a1, but the deletion was canceled.

Example:

```
% aurgdel  -unit df400a1  -ALL
Logical unit exits in the RAID groups.
Are you sure you want to delete the all RAID groups? (y/n [n]): y
If you delete the RAID groups, all logical units will be deleted and the user data
will also be invalid.
Are you sure you want to delete all RAID groups? (y/n [n]): y
User data that are invalid due to deleting all RAID groups cannot be recovered.
Are you sure you want to delete all RAID groups? (y/n [n]): n
Terminate execution.
%
```

3.5.5 Referencing an LU

- Command name

  `auluref`

- Format

  `auluref -unit unit_name [ -lu lun …· ]`

- Description

  This command displays already-defined LU information (capacity, status, pre-read staging amount, current controller No., default controller No., RAID group No. of a RAID group to which to belong, and its RAID level).

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit which you want to reference the LU information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-m`	Expresses the LU capacity in Mbytes. When the specification is omitted, the capacity is expressed in blocks.
`-last`	References the last defined LU.
`-lu lun …·`	Specifies an LU number to reference the LU information. If omitted, all LU information that is already defined will be displayed.

- Examples:

  The following example displays all LU information in array unit df400a1.

  Example:

```
% auluref  -unit df400a1
    Capacity                                RAID   RAID
LU  [block]   Status  Staging  C-CTL  D-CTL  Group  Level
0   100352    Normal  512      0      0      0      5
1   100352    Normal  512      0      0      0      5
2   100352    Normal  512      0      0      0      5
3   100352    Normal  512      0      0      0      5
%
```

  The following example displays information about LU 0 in array unit df400a1.

  Example:

```
% auluref  -unit df400a1  -lu 0 –m
    Capacity                                RAID   RAID
LU  [Mbyte]   Status  Staging  C-CTL  D-CTL  Group  Level
0   778352    Normal  512      0      0      0      5
%
```

3.5.6 Setting Up an LU

- Command name

  auluadd

- Format
  - Dual system

```
auluadd  -unit unit_name  [ -lu lun ]  -rg rg_no  -size num | lest
         -ctl0 | -ctl1
```

  - Single system:

```
auluadd  -unit unit_name  [ -lu lun ]  -rg rg_no  -size num | lest
```

- Description

  This command sets up an LU.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit which an LU is to be added. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols “- (minus)”, or “_ (underline)”.
-lu lun	Specifies the LU number of an LU to be added. The LU number to be specified must be the next number to the last of an already-set number. If omitted, the Manager will automatically apply an LU number.
-rg rg_no	Specifies the RAID group number of a RAID group which an LU is to be added.
-size num | lest	Specifies the capacity (number of blocks) of an LU. When specifying the capacity in Mbytes, add "m" or "M" to the command option. If “lest” is specified for the capacity, all remaining capacity of the RAID group will be assigned.
-ctl0 | -ctl1	Specifies the default controller number of an LU. Specify this option when the array unit is a dual system.

- Example:

  The following example adds LU 3 to RAID group 2 in an array unit with a dual system configuration, whose name is df400a1. The capacity shall be 1,024,000, and the default controller is 0.

  Example:

```
% auluadd  -unit df400a1  -lu 3  -size 1024000  -ctl0  -rg 2
Password:
%
```

3.5.7 Formatting an LU

- Command name

  `auformat`

- Format

  `auformat -unit unit_name -N | -I | -Im [ -f ] -lu lun ...`

- Description

  This command formats a specified LU.

  If multiple LUs are specified, LUs are formatted in the ascending order of LUNs regardless of formatting method.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit in which an LU to format has been defined. Specifies with one-byte coded alphanumeric characters and special symbols "-(minus)" and "_(underline)" of up to 16 characters long.
`-N | -I | -Im`	Specifies the formatting method. **-N:** Formats in the Normal mode in units of LUs. Formatting is executed from the current controller controlling an LU. In registering unit information, the current controller controlling an LU that formats LUs must be registered. **-I:** Formats in the Immediate mode in units of LUs. Formatting is executed from the current controller controlling an LU. In registering unit information, the current controller controlling an LU that formats LUs must be registered. **-Im:** Formats up to six LUs concurrently in the Immediate mode. If this mode is specified, LUs are formatted from their respective controllers with which they are connected regardless of the current controller controlling an LU.
`-lu lun ...`	Specifies the LU Nos. of LUs which to format. When specifying, a single LU No. or multiple LU Nos. can be specified. **Single specification:** Specifies a single LU No.. **Example:** -lu 3 **Multiple specification:** Specifies multiple LU Nos.. **Example:** -lu 0 1 2 3 4 5 8 -lu 0-5 8
`-f`	The confirmation message at command execution is omitted.

- Examples:

  This example formats LU 3 in an array unit, whose name is df400a1, in Normal mode.

  Example:

```
% auformat  -unit df400a1  -N  -lu 3
The logical unit(s) has already been formatted.
Are you sure you want to format the logical unit(s) again? (y/n [n]): y
User data in the logical unit(s) will be invalid.
Are you sure you want to format the logical unit(s)? (y/n [n]): y
User data that are invalid due to formatting the logical unit(s) cannot be recovered.
Are you sure you want to format the logical unit(s)? (y/n [n]): y
Password:
LU3 format start
LU3 format end: Normal Terminated
%
```

  The following example formats LUs 4 to 7 in array unit df400a1, in Immediate mode. The confirmation messages is omitted using the –f option.

  Example:

```
% auformat  -unit df400a1  -I  -lu 4-7  -f
Password:
LU4 format start
LU4 format end: Normal Terminated
LU5 format start
LU5 format end: Normal Terminated
LU6 format start
LU6 format end: Normal Terminated
LU7 format start
LU format end: Normal Terminated
%
```

3.5.8 Displaying Progress of LU Formatting

- Command name

  `auformatst`

- Format

  `auformatst -unit unit_name -lu lun`

- Description

  This command displays the progress of formatting LUs for which to specify formatting in the Immediate mode.

  While a specified LU is being formatted, the progress (in percent) of formatting is displayed. When formatting immediately after an LU has been set up or its size has been expanded, or the formatting has been completed, the following indication is displayed:

  - "100%" is displayed when the LU is normal.
  - "0%" is displayed when the LU is in condition other than above.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit in which LUs have been defined. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-lu lun`	Specifies the LU No. of an LU for which to check the progress.

- Examples:

  The following example confirms the progress after specifying to format LU 4 in array unit df400a1, in Immediate mode.

  Example:

```
% auformat  -unit df400a1  -lu 4  -I  -f
Password:
LU4 format start
LU4 format end: Normal Terminated
%
% auformatst  -unit df400a1  -lu 4
df400a1 LU 4 17 %
% auformatst  -unit df400a1  -lu 4
df400a1 LU 4 50 %
% auformatst  -unit df400a1  -lu 4
df400a1 LU 4 81 %
% auformatst  -unit df400a1  -lu 4
df400a1 LU 4 94 %
% auformatst  -unit df400a1  -lu 4
df400a1 LU 4 100 %
%
```

3.5.9 Expanding an LU

- Command name

  `auluexp`

- Format

  `auluexp -unit unit_name -lu lun -incr size | lest`

- Description

  This command expands the size of an LU. Note that only the last LU in each RAID group can be expanded (LU with the largest LU No. assigned within each RAID group).

- Options

Options	Description
`-unit unit_name`	Specifies 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 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-lu lun`	Specifies the LU number of an LU which its size is to be expanded.
`-incr size [ -m ] | lest`	Specifies the increment (in the number of blocks) of the size to expand. When specifying it in Mbytes, add "m" or "M" to the command option. If "lest" 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 LU 3 in array unit df400a1 by an increment of 3072 blocks.

  Example:

```
% auluexp  -unit df400a1  -lu 3  -incr 3072
Password:
%
```

  The following example assigns to LU 3 in array unit df400a1, all remaining capacity of a RAID group to which this LU belongs.

  Example:

```
% auluexp  -unit df400a1  -lu 3  -incr lest
Password:
%
```

3.5.10 Deleting an LU

- Command name

  `auludel`

- Format

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

- Description

  This command deletes the last defined LU.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit in which the LUs are defined. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-last`	Specify this option when referencing the last defined LU.
`-f`	The confirmation message at command execution is omitted.

- Example:

  This example deletes the last LU in array unit df400a1.

  Example:

```
% auludel  -unit df400a1  -last
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 last defined logical unit xxx, all user data will be invalid.
Are you sure you want to delete logical unit? (y/n [n]): y
User data that are invalid due to deleting the last defined logical unit xxx cannot be
recovered.
Are you sure you want to delete the last defined logical unit? (y/n [n]): y
Password:
%
```

3.5.11 Changing the Default Controller of an LU

- Command name

  auluchg

- Format

  auluchg -unit unit_name -lu lun

- Description

  This command changes default controller of a connected LU to another controller.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which LUs have been defined. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
-lu lun	Specifies the LU number of an LU whose default controller is to be changed.

- Examples:

  This example changes the default controller with which LU 2 is connected in array unit df400a1.

  Example:

```
% auluchg  -unit df400a1  -lu 2
Password:
Default controller for the LU modification completed successfully.
Please reboot Array for changes to take effect.
%
```

  This example changes the default controller with which LU 2 is connected in an array unit df400a2 and which supports restarting.

  Example:

```
% auluchg  -unit df400a2  -lu 2
Password:
Default controller for the LU modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

3.5.12 Setting Turbo LU

- Command name

  ```
  auturbolu
  ```

- Format

  ```
  auturbolu  -unit unit_name  -refer

  auturbolu  -unit unit_name  -set
             [ -ctl0_assign enable | disable  -ctl0_lu lun ]
             [ -ctl1_assign enable | disable  -ctl1_lu lun ]
  ```

- Description

  References the status of whether turbo LU is resident or not, and sets the turbo LU.

  Note: Optional software must be installed on array unit. The Array Unit must be rebooted for the setting to become effective.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit for which to reference the LU cache residence state and in which to set LU cache resident. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-refer`	References whether the status of the turbo LU is resident or not.
`-set`	Sets the turbo LU.
`-ctl0_assign enable | disable` `-ctl1_assign enable | disable`	Validates or invalidates the resident status of the turbo LU of Controllers 0 and 1.
`-ctl0_lu lun` `-ctl1_lu lun`	Specifies the LU No. of an LU for which turbo LU is set resident.

- Examples:

  The following example references whether the status of the turbo LU of array unit df400a1 is resident or not.

  Example:

```
% auturbolu  -unit df400a1  -refer
Password:
Controller 0
Current Configuration
  Turbo LU Assignment       : off
  Turbo LU                  :
  Turbo LU Status           :
Reserved Configuration
  Turbo LU Assignment       : off
  Turbo LU                  :

Controller 1
Current Configuration
  Turbo LU Assignment       : off
  Turbo LU                  :
  Turbo LU Status           :
Reserved Configuration
  Turbo LU Assignment       : off
  Turbo LU                  :
%
```

  The following example sets the turbo LU in array unit df400a1.

  Example:

```
% auturbolu  -unit df400a1  -set  -ctl0_assign enable  -ctl0_lu 3 \
-ctl1_assign disable  -ctl1_lu 4
Password:
Turbo LU modification completed successfully.
Please reboot Array for changes to take effect.
%
```

  The following example sets the turbo LU in array unit df400a2 which supports restarting.

  Example:

```
% auturbolu  -unit df400a2  -set  -ctl0_assign enable  -ctl0_lu 3 \
-ctl1_assign disable  -ctl1_lu 4
Password:
Turbo LU modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

3.5.13 Referencing the Unified LU

- Command name

  `aumluref`

- Format

  `aumluref –unit unit_name [ -m ]`

- Description

  This command references the status of the unified LU.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit in which the LUs are defined. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-m`	Specify this option when expressing the LU capacity in Mbytes. When this option is omitted, the capacity is expressed in blocks.

- Example:

  The following example references the status of the unified LU in array unit df500.

  Example:

```
% aumluref -unit df500 –m
     Capacity
LU   [Mbyte]  Status  Sub LU
 1   106352   Normal  2
%
```

3.5.14 Unifying LUs

- Command name

  `aulumrg`

- Format

  `aulumrg –unit unit_name -lu main_lun sub_lun`

- Description

  This command unifies the LUs.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit in which the LUs are defined. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols “- (minus)”, or “_ (underline)”.
`-lu main_lun sub_lun`	Specifies the LU numbers to be unified. The properties of the LU numbers will not be checked.

- Example:

  The following example unifies LU2 as MainLU with LU3 as SubLU in array unit df500.

  Example:

```
% aulumrg –unit df500 –lu 2 3
If the RAID level or the HDU combination of the unifying LUs does not match,
the performance may be degraded.
Are you sure you want to unify the LUs? (y/n [n]): y
Password:
%
```

3.5.15 Separating LUs

- Command name

  `aumludiv`

- Format

  `aumludiv –unit unit_name -lu main_lun last | all`

- Description

  This command separates the unified LUs into individual LUs.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit in which the LUs are defined. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-lu main_lun last | all`	Specifies the LU number to be separated. Specify the LU number. The properties of the LU numbers will not be checked. **last:** Separates the internal LU which has been unified last. **all:** Separates all the internal unified LUs.

- Example:

  The following example separates the LU, which has been unified last, from the unified LU (LU2) in array unit df500.

  Example:

```
% aumludiv –unit df500 –lu 2 last
Are you sure you want to separate the last LU from the unified LU? (y/n [n]): y
Password:
%
```

3.6 Setting Up Configuration

3.6.1 Referencing/Setting Fibre Channel Information

- Command name

  ```
  aufibre
  ```

- Format

  ```
  aufibre  -unit unit_name  -refer

  aufibre  -unit unit_name  -set  -ctl0 | -ctl1  -port A | B
           [ -FC-AL | -Fabric ]
           [ -portinfo n_port_id ]  [ -access-guard on | off ]
           [ -permission node_name port_name [ -permission-lu lun ... ] ]

  aufibre  -unit unit_name  -set  -ctl0 | -ctl1  -port A | B
           [ -FC-AL | -Fabric ]
           [ -portinfo n_port_id ]  [ -access-guard on | off ]
           [ -file filename ]

  aufibre  -unit unit_name  -rm  -ctl0 | -ctl1  -port A | B
           -permission node_name port_name  [ -permission-lu lun ... ]
  ```

- Description

  References and sets fibre channel information.

  Note: Optional software must be installed in array unit to use LUN Security. The array unit must be rebooted for changes to become effective.

- Options

Options	Description
`-unit unit_name`	Specifies 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 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-refer`	Displays all already-set fibre channel information.
`-set`	Sets fibre channel information.
`-rm`	Deletes port security information and LUN security information.
`-ctl0 | -ctl1`	Specifies a controller for which to set and delete fibre channel information.
`-port A | B`	Specifies a port for which to set and delete fibre channel information.
`-FC-AL | -Fabric`	Sets the topology of a specified port in a specified controller. **-FC-AL:** Sets the topology to FC_AL. **-Fabric:** Sets the topology to Fabric.

(Continued)

Options	Description
`-portinfo n_port_id`	Specifies the N_port ID of a specified port in a specified controller. Specify the n_port_id using six hexadecimal characters.
`-access-guard on | off`	Specifies whether to validate or invalidate port security of a specified port in a specified controller. **on:** Validates port security (a port specified by -port option accepts security from only a host specified by -permission option). **off:** Invalidates port security (does not limit the host that accesses a port specified by -port option).
`-permission node_name port_name`	**When the -set option is specified:** When using port security, specifies access permission host information (node name, port name). **node_name:** Node name of the host (16 hexadecimal characters) **port_name:** Port name of the host (16 hexadecimal characters)
`-permission-lu lun ...`	**When the -set option is specified:** When using LUN security, this option specifies access permission. LUNs (multiple LUNs can be specified). When specifying -permission-lu option, host information must be specified by -permission option. If the host information specified by -permission is not yet set, the access permission host information and the LUN security information are set together at the same time. If host information specified by -permission option is already set, LUN security information will be set additionally.
`-file filename`	When setting host security all together by file input, this option specifies the host permission information file.
`-permission node_name port_name`	**When the -rm option is specified:** Specifies host information (node name, port name) which you want to exclude from host security. **node_name:** Node name of the host (16 hexadecimal characters) **port_name:** Port name of the host (16 hexadecimal characters)
`-permission-lu lun ...`	**When the -rm option is specified:** When using LUN security, this option specifies LUNs (multiple LUNs can be specified) which you want to exclude from access permission LUs. When specifying -permission-lu option, host information must be specified by -permission option.

- Examples:

  The following example references the fibre channel information of array unit df400a1.

  Example:

```
% aufibre  -unit df400a1  -refer
Password:
LUN security
  CTL 0   on
  CTL 1   on

Topology Information
CTL      Port     Topology
0  A   FC-AL
0  B   FC-AL
1  A   FC-AL
1  B   FC-AL

Port Information
CTL Port  Node name         Port name         N port_ID
0   A     50000E100000232F  50000E100000232F  0000EF
0   B     0000000000000000  0000000000000000  0000EF
1   A     0000000000000000  0000000000000000  0000EF
1   B     0000000000000000  0000000000000000  777777

SFC Firmware Revision
                    Sequence  Operational  PowOnSelf
CTL Port  BIU       Manager   Firmware     TestFirm   ENDEC+    FC-PH
0   A     00000004  10020193  02125805     01102000   3001506D  09/09
0   B     00000000  00000000  00000000     00000000   00000000  00/00
1   A     00000000  00000000  00000000     00000000   00000000  00/00
1   B     00000000  00000000  00000000     00000000   00000000  00/00

Security Information
CTL Port  Access        Node name          Port name         N port_ID
          Guard
0   A     disable      AAAAAAAAAAAA0A00    0AAAAAAAAAAAAA00  000000
                       25 30 50 60 63
0   B     disable      0B01000000000000    0B00000000000001  0B0100

1   A     disable      AAAAAAAAAAAA1A00    1AAAAAAAAAAAAA00  000000
                       6 12 34 43
1   B     disable      BBBBBBBBBBBB1B00    1BBBBBBBBBBBBB00  000000
                       15 23 31 34 55
%
```

The following example sets Fabric to the topology of Port A on controller 0 of array unit df400a1.

Example:

```
% aufibre  -unit df400a1  -set  -ctl0  -port A  -Fabric
Password:
Fibre channel information modification completed successfully.
Please reboot Array for changes to take effect.
%
```

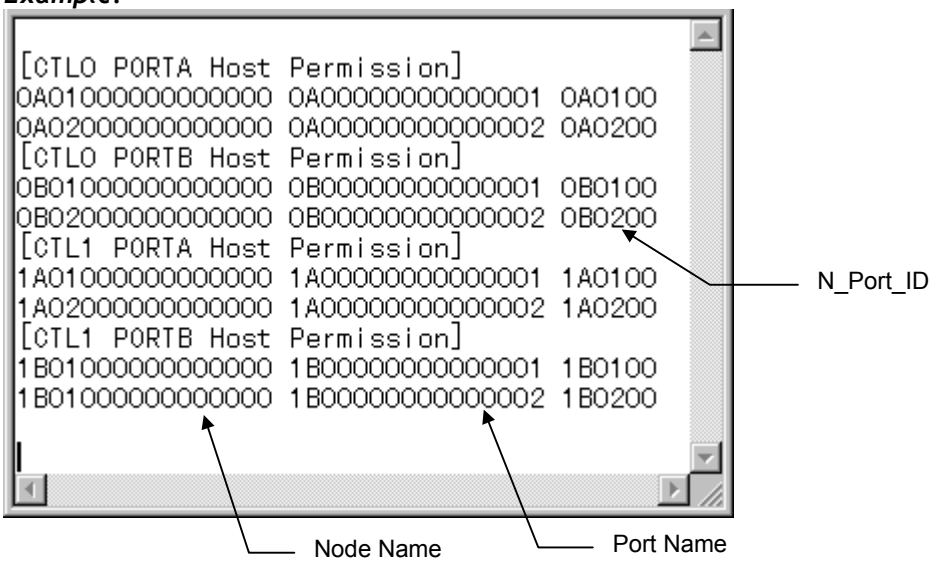
The following example sets Fabric to the topology of Port A on controller 0 of array unit df400a2 which supports remote restarting.

Example:

```
% aufibre  -unit df400a2  -set  -ctl0  -port A  -Fabric
Password:
Fibre channel information modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

The following figure shows a file format for the case where settings are performed by using "File". Enter necessary items for each port and enter a blank character between items. If tabs are used, the setting of the line including "tab" are ignored because it is regarded as an input error.

Example:



- **Node Name:** Describes 8 bytes of data hexadecimal (with 16 characters).
- **Port Name:** Describes 8 bytes of data hexadecimal (with 16 characters).
- **N_Port_ID:** Describes 3 bytes of data hexadecimal (with 6 characters). Concerning the host identification information, this data can be omitted. When the data is omitted, it is assumed to be 0X000000.

When a line begins with ";", the line is regarded as a comment line.

- Command name

  ```
  aufibre1
  ```

- Format

  – 9200:

  ```
  aufibre1  -unit unit_name  -refer
  ```

  – 9200:

  ```
  aufibre1  -unit unit_name  -set
            [ -topo ctl_no topology2 ]
            [ -rate ctl_no 1 | 2 ]
            [ -portaddr ctl_no port_no port_address ]
            [ -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 ]
            [ -file ctl_no port_no filename ]
  ```

  – 9200:

  ```
  aufibre1  -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 ]
  ```

- Description

  This command references or sets fibre channel information.

- Option

Options	Description
`-unit unit_name`	Specifies 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 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-refer`	Displays all already-set fibre channel information.
`-set`	Sets fibre channel information.
`-rm`	Deletes port security information and LUN security information.

`-topo`
`ctl_no port_no`
`topology1`
	Specifies the topology of the specified controller.
	ctl_no: Controller number (0 or 1)
	port_no: Port name (A or B)
	topology1: Type of topology
	FC-AL: FC-AL
	Fabric: Fabric Point-to-Point

`-topo`
`ctl_no port_no`
`topology2`
	Specifies the topology of the specified port.
	ctl_no: Controller number (0 or 1)
	port_no: Port name (A or B)
	topology2: Type of topology
	loop: loop
	ptop: Point-to-Point

`-rate`
`ctl_no port_no`
`1 | 2`
	Specifies the fibre channel transfer rate of the specified port.
	ctl_no: Controller number (0 or 1)
	port_no: Port name (A or B)
	1: 1 (G bps)
	2: 2 (G bps)

`-portaddr`
`ctl_no port_no`
`port-address`
	Specifies the port address of the specified port.
	ctl_no: Controller number (0 or 1)
	port_no: Port name (A or B)
	port-address: Port address (6 hexadecimal characters)

`-accguard`
`ctl_no port_no`
`on | off`
	Specifies whether the port security of the specified port is enabled or disabled.
	ctl_no: Controller number (0 or 1)
	port_no: Port name (A or B)
	on: Enables the port security.
	off: Disables the port security.

`-lus`
`ctl_no port_no`
`on | off`
	Specifies whether the LUN security of the specified port is enabled or disabled.
	ctl_no: Controller number (0 or 1)
	port_no: Port name (A or B)
	on: Enables the LUN security.
	off: Disables the LUN security.

(Continued)

Options	Description
-luschk ctl_no port_no inqc | allc	Specifies the LUN security check level of the specified port. **ctl_no:** Controller number (0 or 1) **port_no:** Port name (A or B) **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:** Specifies host information (node name and port name) that can be accessed by the specified port. **When the -rm option is specified:** Specifies 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 or 1) **port_no:** Port name (A or B) **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:** Specifies 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 or 1) **port_no:** Port name (A or B) **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:** Specifies the host information whose access permission is to be deleted from the LUN security set by the specified port. **ctl_no:** Controller number (0 or 1) **port_no:** Port name (A or B) **node_name:** Node name of the host (16 hexadecimal characters) **port_name:** Port name of the host (16 hexadecimal characters)

(Continued)

Options	Description
-file ctl_no port_no filename	When setting host security all together by file input, this option specifies the host permission information file. **ctl_no:** Controller No. (0 or 1) **port_no:** Port name (A or B) **filename:** File name which to input

- Examples:

  The example of referencing the fiber channel information of the array unit name df400a1:

  – Same as the aufibre command.

  The example of referencing the fiber channel information of array unit name df500a1:

  – Same as the aufibre command.

  The following example sets the topology of Port A of controller 0 of the array unit name df400a1 to Fabric.

  Example:

```
% aufibre1  -unit df400a1  -set  -topo 0 Fabric
Password:
Fibre channel information modification completed successfully.
Please reboot Array for changes to take effect.
%
```

  The following example sets the topology of Port A of controller 0 of array unit name df400a2 supporting re-activation, to Fabric.

  Example:

```
% aufibre1  -unit df400a2  -set  -topo 0 Fabric
Password:
Fibre channel information modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

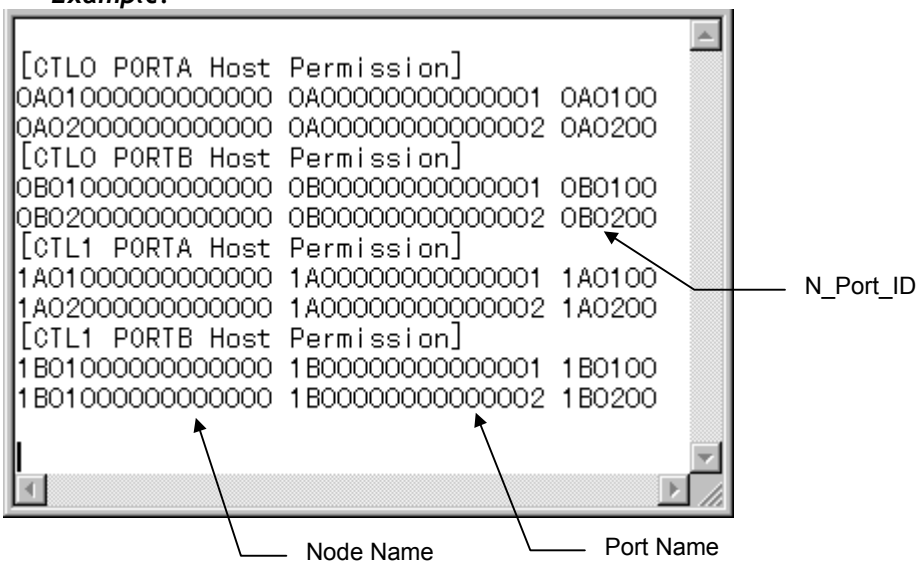
  The following example sets the topology of Port A of controller 0 of array unit name df500a1 to loop.

  Example:

```
% aufibre1  -unit df500a1  -set  -topo 0 A loop
Password:
When setting starts, the subsystem stops accepting the access to the port from the
host.
Before setting, stop the access to the port from the host.
Do you want to continue processing? (y/n [n]): y
Fibre channel information modification completed successfully.
%
```

The following figure shows a file format for the case where settings are performed by using "File". Enter necessary items for each port and enter a blank character between items. If tabs are used, the setting of the line including the "tab" are ignored because it is regarded as an input error.

Example:



- **Node Name:** Describes 8 bytes of data hexadecimal (with 16 characters).
- **Port Name:** Describes 8 bytes of data hexadecimal (with 16 characters).
- **N_Port_ID:** Describes 3 bytes of data hexadecimal (with 6 characters). Concerning the host identification information, this data can be omitted. When the data is omitted, it is assumed to be 0X000000.

When a line begins with ";", the line is regarded as a comment line.

3.6.2 Spare HDU Setup

- Command name

  auspare

- Format

  auspare -unit unit_name -set -uno unit_no -hno hdu_no

  auspare -unit unit_name -rm -uno unit_no -hno hdu_no

- Description

  This command sets up the specified HDU as a spare HDU and cancels the spare HDU attribute of an already specified spare HDU.

  An HDU cannot be set as a spare when the HDU is not installed.

- Options

Options	Description
-unit unit_name	Specifies the name of the array unit to set or cancel the spare HDU. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
-set	Sets up the spare HDU.
-rm	Cancels the spare HDU.
-uno unit_no	Specifies the Unit number of the spare HDU.
-hno hdu_no	Specifies the HDU number of the spare HDU.

- Examples:

  The following example sets up the spare HDU of array unit name df500a1. The position of the spare HDU is the HDU position with Unit number of 0 and HDU number of 9.

  Example:

```
% auspare  -unit df500a1  -set  -uno 0  -hno 9
Password:
%
```

  The following example checks the setting of the spare HDU in an array unit df500a1 by using the audrive command. Spare HDUs will be indicated as "Spare" in "Type" column.

  Example:

```
% audrive  -unit df500a1  -status  -uno 0  -hno 9
Unit No.   HDU No.  Type   Physics  Status
0          9        Spare  Mounted  Standby
%
```

3.6.3 Referencing/Setting Fee-Basis Option

- Command name

  auopt

- Format

  auopt -unit unit_name -refer

  – Key-FD:

  auopt -unit unit_name -lock off | on -keyfd fd-path

  – Key-code:

  auopt -unit unit_name -lock off | on -keycode key-code

  auopt -unit unit_name -option option_name -st enable | disable

- Description

  This command locks or unlocks the specified fee-basis option. Unlocking or locking can be carried out by the key FD or the key code described in key FD which is attached to the option facility.

  The fee-basis option can be enabled or disabled after it is unlocked (installed).

- Options

Options	Description
-unit unit_name	Specifies the name of the array unit to set up or reference the fee-basis option. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
-refer	An unlocked fee-basis option is displayed.
-lock off | on	Specifies the fee-basis option to be locked or unlocked. **off:** Unlocks the fee-basis option. **on:** Locks the fee-basis option.
-keyfd fd-path	Specifies the directory storing the key FD when it is used to unlock or lock the fee-basis option. **fd-path:** Directory in which the key FD exists
-keycode key-code	Specifies the key code when used to unlock or lock the fee-basis option. **key-code:** Key code
-option option-name	Specifies the option name when enabling or disabling the unlocked fee-basis option. **option-name:** Option name For the option name, refer to the manual for each individual fee-basis option.
-st enable | disable	Specifies 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 the array unit df500a1.

  Example:

```
% auopt  -unit df500a1  -refer
Password:
Option name     Status
SNMP            Enable
%
```

  The following example unlocks (installs) the SNMP fee-basis option that requires rebooting of array unit df500a1, using the key FD.

  Example:

```
% auopt  -unit df500a1  -lock off  -keyfd a :
Password:
Option was opened.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

  The following example enables the SNMP fee-basis option that requires rebooting of array unit df500a1.

  Example:

```
% auopt  -unit df500a1  -option SNMP  -st enable
Password:
Option modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

  The following example unlocks the LUN Security fee-basis option that does not require rebooting of array unit df500a1, using the key FD.

  Example:

```
% auopt  -unit df500a1  -lock off  -keyfd a :
Password:
Option was opened.
%
```

3.6.4 Referencing/Setting Drive Restoration Control Information

- Command name

  ```
  audrecopt
  ```

- Format

  ```
  audrecopt  -unit unit_name  -refer
  audrecopt  -unit unit_name  -set
             [ -restor back | normal | priority ]  [ -auto enable | disable ]
             [ -sparing rwv | rw | not ]  [ -interval interval_time ]
             [ -size n ]
  ```

- Description

  This command references and sets drive restoration control information.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit for which to reference and set drive restoration control information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-refer`	References drive restoration control information.
`-set`	Sets drive restoration control information.
`-restor back | normal | priority`	Specifies the drive restoration mode. **back:** Execute the restoration processing in the intervals of the host command processing. **normal:** Gives priority to the processing of commands from the host, and executes the restoration processing at a certain interval after a host command terminates. **priority:** Executes the restoration processing at a certain interval with higher priority than that of the processing of commands from the host.
`-auto enable | disable`	Specifies whether or not to automatically start the copy from the spare drive (copy-back).
`-sparing rwv | rw | not`	Specifies the operating mode of dynamic sparing. **rwv:** When the count of either Read/Write errors or Online Verify errors exceeds a predetermined threshold value, starts dynamic sparing. **rw:** When the count of Read/Write errors exceeds a predetermined threshold value, starts dynamic sparing. **not:** Although the count of either Read/Write errors or Online Verify errors exceed a predetermined threshold value, does not start dynamic sparing.

(Continued)

Options	Description
-interval interval_time	Specifies the interval at which to execute the restoration processing. Specify the time using a value from 0 to 255 in units of 10 ms. The default value is 10, which executes restoration at an interval of every 100 ms.
-size n	Specifies the unit of restored data per single operation in the restoration processing. 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 kbyte data in a single operation.

- Examples:

  The following example displays the drive restoration control information of array unit df400a1.

  Example:

```
% audrecopt  -unit df400a1  -refer
Password:
Drive restoration mode        : Background
Drive restoration             : Automatically
Sparing                       : Executing (Read/Write & Online Verify)
Interval time [10ms]          : 10
Processing Unit Size [blocks] : 32
%
```

  The following example sets the drive restoration control information for array unit df400a1.

  Example:

```
% audrecopt  -unit df400a1  -set  -restor normal  -auto enable  -interval 10
-size 64  -sparing rwv
Password:
%
% audrecopt  -unit df400a1  -refer
Password:
Drive restoration mode        : Interleave (standard)
Drive restoration             : Automatically
Sparing                       : Execution (Read/Write & Online Verify)
Interval time [10ms]          : 10
Processing Unit size [blocks] : 64
%
```

3.6.5 Referencing/Setting Online Verify Information

- Command name

  ```
  auonlineverify
  ```

- Format

  ```
  auonlineverify  -unit unit_name  -refer
  auonlineverify  -unit unit_name  -set
                  [ -verify enable | disable ]  [ -time time ]
  ```

- Description

  This command references and sets online verify information.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit for which to reference and set online verify information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-refer`	References online verify information.
`-set`	Sets online verify information.
`-verify enable | disable`	Specifies whether or not to perform an online verify test.
`-time time`	Specifies the idling time (0 to 30 seconds). If "0" is specified, the idling time is set to 10 seconds.

- Examples:

  The following example references the online verify information of array unit df400a1.

  Example:

```
% auonlineverify  -unit df400a1  -refer
Password:
Online verify test      : Yes
Idling time   [sec]     : 0
%
```

The following example sets the online verify information to array unit df400a1, then references the information.

Example:

```
% auonlineverify  -unit df400a1  -set  -verify enable  -time 5
Password:
%
% auonlineverify   -unit df400a1  -refer
Password:
Online verify test      : Yes
Idling time   [sec]     : 5
%
```

3.6.6 Referencing/Setting ShadowImage 9200 Information

- Command name

  `aumrcfdev`

- Format

  ```
  aumrcfdev  -unit unit_name  -refer
  aumrcfdev  -unit unit_name  -rm –dev n
  ```

  – When the command device is not set:

  ```
  aumrcfdev  -unit unit_name -set [ -id string ] -dev n lu
  ```

  – When the command device has previously been set:

  ```
  aumrcfdev  -unit unit_name -set -dev n lu
  ```

- Description

  This command references and sets the command device and the serial ID of ShadowImage 9200.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit for which to reference and set ShadowImage 9200 information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-refer`	References the command device and the serial ID.
`-set`	Sets the command device and the serial ID.
`-rm`	Deletes the command device.
`-id string`	Specifies the serial ID in 4 characters using numeric characters (0000 to 9999).
`-dev n lu on | off`	Specifies parameters of the command device. **n**: The command device number (1 or 2) **lu**: The logical unit number
`-dev n`	Specifies the command device number to delete. **n**: The command device number (1 or 2)

- Examples:

  The following example references ShadowImage 9200 set-up information whose array unit name is df500a1.

  Example:

```
% aumrcfdev  -unit df500a1  -refer
Password:
Serial ID
  0123

Command device  LUN
1               1
2               10
%
```

  The following example sets up array unit df500a1, as command device 1, with its logical number set to 0.

  Example:

```
% aumrcfdev  -unit df500a1  -set –dev 1 0
Password:
%
```

3.6.7 Displaying Coupled Pair LUs of ShadowImage 9200

- Command name

  `aumrcfluc`

- Format

  `aumrcfluc  -unit unit_name [ -m ]`

- Description

  This command displays the status of a pair LUs that are coupled in ShadowImage 9200.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit for which to reference ShadowImage 9200 information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".

- Examples:

  The following example references the ShadowImage 9200 information of array unit df500a1.

  Example:

```
% aumrcfluc  -unit df500a1
Password:
LU   RAID   RAID   Capacity
     Group  Level  [block]    D-CTL  C-CTL  Status
2/3  0/1    5/5    100000000  0      0      PAIR
7/8  2/3    1/1    100000000  1      1      PAIR
%
```

3.6.8 Rebooting

- Command name

  aureboot

- Format

  aureboot -unit unit_name

- Description

  This command reboots the subsystem.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference ShadowImage 9200 information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".

- Examples:

  The following example reboots array unit df500a1.

  Example:

```
% aureboot  -unit df500a1
Password:
Do you want to restart the subsystem? (y/n [n]): y
When restarting the subsystem, the I/O operation that is being executed in the
subsystem will end abnormally.
Do you want to restart the subsystem? (y/n [n]): y
The subsystem stops accepting the I/O operation from the host until the restart
completes.
Also, if you are logging in, the login status will be canceled when restarting begins.
Do you want to restart the subsystem? (y/n [n]): y
Now restarting the subsystem.  Start Time HH:MM
The subsystem restarted successfully.
%
```

  The following example reboots array unit df500a1 whose status is stopping under pseudo-plan.

  Example:

```
% aureboot  -unit df500a1
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
The subsystem restarted successfully.
%
```

3.6.9 Referencing/Setting the Remote Path Information

- Command name

  ```
  aurmtpath
  ```

- Format

  ```
  aurmtpath  -unit unit_name  -refer

  aurmtpath  -unit unit_name  -set
             -remote serial_no equipment_type serial_id
             -path0 0A | 0B  0A | 0B | 1A | 1B
             -PARH1 1A | 1B  0A | 0B | 1A | 1B

  aurmtpath  -unit unit_name  -rm
  ```

- Description

  This command references and sets the remote path of the specified array unit.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit in which the remote path information is to be referenced or set. Specify the name in less than or equal to 16 characters using alphanumerics, special symbols "- (minus)", or "_ (underline)".
`-refer`	References the remote path information.
`-set`	Sets the remote path information.
`-rm`	Deletes the remote path information.

`-remote`
`serial_no`
`equipment_type`
`serial_id`
	Specifies the remote path information.
	serial_no: Serial number of the remote array unit in 4 characters using numeric characters (0000 to 9999).
	equipment_type: Equipment type of the remote array unit (RK or RKL).
	serial_id: Specifies the serial ID unit in 4 characters using numeric characters (0000 to 9999).

`-path0`
`0A | 0B`
`0A | 0B | 1A | 1B`
	Specifies the path-0 information.
	0A | 0B: The path-0 information of local array unit.
	0A | 0B | 1A | 1B: Remote path information of the remote array unit.

`-path1`
`1A | 1B`
`0A | 0B | 1A | 1B`
	Specifies the path-1 information.
	0A | 0B: The path-1 information of local array unit.
	0A | 0B | 1A | 1B: Remote path information of the remote array unit.

- Examples

  The following example references the remote path information of array unit df500a1.

Example:

```
% aurmtpath  –unit df500a1  –refer
Password:
Local Information
    Serial Number  : 0012
    Equipment Type : RK
    Serial ID      : 0012

Remote Information
    Serial Number  : 2362
    Equipment Type : RK
    Serial ID      : 2362

Path     Local    Remote   Status
   0        0A        0A   NORMAL
   1        1A        1B   NORMAL
%
```

The following example sets up array unit df500a1 as remote path information.

– **path-0** for 0A and **path-1** for 1A port on the local subsystem

– **path-0** for 0A port and **path-1** for 1B port on the remote subsystem with serial Number **2362** equipment ID **RK** and serial ID **2362**.

Example:

```
% aurmtpath  -unit df500a1  -set –remote 2362 RK 2362 –path0 0A 0A –path1 1A 1B
Password:
%
```

3.6.10 Referencing/Setting the Command Device Information

- Command name

  aucmddev

- Format

  ```
  aucmddev  -unit unit_name  -refer
  aucmddev  -unit unit_name  -rm –dev n
  ```

  – When the command device is not set:

  ```
  aucmddev  -unit unit_name -set [ -id string ] -dev n lu
  ```

  – When the command device has previously been set:

  ```
  aucmddev  -unit unit_name -set -dev n lu
  ```

- Description

  This command references and sets the command device and the serial ID.

- Options

Options	Description
`-unit unit_name`	Specifies 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 16 characters using alphanumerics, special symbols "- (minus)", or "_ (underline)".
`-refer`	References the command device and the serial ID.
`-set`	Sets the command device and the serial ID.
`-rm`	Deletes the command device.
`-id string`	Specifies the serial ID in 4 characters using numeric characters (0000 to 9999).
`-dev n lu on | off`	Specifies the parameter of the command device. **n**: Command device number (1 or 2). **lu**: Logical unit number.
`-dev n`	Specifies the command device number to be deleted. **n**: Command device number (1 or 2).

- Examples

  The following example references command device set-up information for array unit df500a1.

Example:

```
% aucmddev  -unit df500a1  -refer
Password:
Serial ID
  0123

Command device  LUN
1               1
2               10
%
```

The following example sets up array unit df500a1 as command device 1, with its logical number set to 0.

Example:

```
% aucmddev  -unit df500a1  -set –dev 1 0
Password:
%
```

3.7 System Parameters

3.7.1 Referencing/Setting System Parameters

- Command name

  ausysparam

- Format
  - 9200:

```
ausysparam  -unit unit_name  -refer
```

  - 9200 (SCSI version):

```
ausysparam -unit unit_name -set
          [ -SystemStartup Single | DuaIlDTake | DualNotIDTake |
                           HotIDTake | HotNotIDTake ]
          [ -TakingID port_no ctl_no ]
          [ -DataShare used | notUsed ]
          [ -HostConnection ctl_no port_no
                           standard | OpenVMS | TRESPASS | WolfPack |
                           IBM7135 | NCR ]
          [ -SerialNumber string ]
          [ -DelayPlannedShutdown time ]
          [ -VxVM ctl_no port_no enable | disable ]
          [ -DriveDetach enable | disable ]
          [ -OdeMapper ctl_no port_no enable | disable ]
          [ -ReportInquiry ctl_no port_no enable | disable ]
          [ -MultipathController enable | disable ]
          [ -PROCOM enable | disable ]
          [ -ReportStatus enable | disable ]
          [ -MultipathArrayUnit enable | disable ]
          [ -LuCacheWarning enable | disable ]
          [ -NX enable | disable ]
          [ -AutoReconst enable | disable ]
          [ -ForcedWriteThrough enable | disable ]
          [ -LUCanging1 enable | disable ]
          [ -UASuppress ctl_no port_no enable | disable ]
          [ -HISUP ctl_no port_no enable | disable ]
          [ -CCHS ctl_no port_no enable | disable ]
          [ -InquiryStandard ctl_no port_no enable | disable ]
          [ -ProdidDF400 ctl_no port_no enable | disable ]
          [ -SUNCluster ctl_no port_no enable | disable ]
          [ -PRSV ctl_no port_no enable | disable ]
          [ -DataStriping 16 | 32 | 64 ]
          [ -LuSizeReport auto | not ]
          [ -ProcessorFailures reset | shutdown ]
```

```
[ -inquiryCommandQueue on | off ]
[ -inquiryAnsiVersion 2 | 3 ]
[ -inquiryVendor string ]
[ -inquiryProduct string ]
[ -inquiryRomMicro string ]
[ -inquiryRamMicro string ]
[ -WebTitle string ]
[ -CacheMode off | random ]
[ -PortTypeOption ctl_no port_no
                ResetLipSignal | ResetLipProcess |
                TargetReset | Reserve enable | disable ]
[ -PseudoResponse ctl_no busy | notReady ]
[ -SaveDataPointer ctl_no port_no
                nothing | data | cmd | datacmd ]
[ -ControllerIdentifier ctl_no enable | disable ]
[ -ControllerID ctl_no 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 ]
[ -setSM ctl_no port_no tid ]
[ -rmSM ctl_no port_no tid ]
[ -setMS ctl_no port_no tid lu ]
[ -rmMS ctl_no port_no tid lu ]
[ -setMM ctl_no port_no tid hlu lu ]
[ -rmMM ctl_no port_no tid hlu lu ]
[ -sync ctl_no port_no standard | async |
                N5 | N10 | N20 | N40 | W10 | W20 | W40 | W80 ]
[ -fd on | off ]
```

– 9200 (Fibre version):

```
ausysparam -unit unit_name –set
          [ -SystemStartup Single | DualIDTake | DualNotIDTake |
                           HotIDTake | HotNotIDTake ]
          [ -TakingID Port_no ctl_no ]
          [ -DataShare used | notUsed ]
          [ -HostConnection ctl_no port_no
                            standard | OpenVMS | TRESPASS | WolfPack ]
          [ -SerialNumber string ]
          [ -DelayPlannedShutdown time ]
          [ -VxVM ctl_no port_no enable | disable ]
          [ -DriveDetach enable | disable ]
          [ -HPUX ctl_no port_no enable | disable ]
          [ -ReportInquiry ctl_no port_no enable | disable ]
          [ -MultipathController enable | disable ]
          [ -PROCOM enable | disable ]
          [ -ReportStatus enable | disable ]
          [ -MultipathArrayUnit enable | disable ]
          [ -LuCacheWarning enable | disable ]
          [ -NX enable | disable ]
          [ -AutoReconst enable | disable ]
          [ -ForcedWriteThrough enable | disable ]
          [ -LUCanging1 enable | disable ]
          [ -RAID3 enable | disable ]
          [ -UASuppress ctl_no port_no enable | disable]
          [ -HISUP ctl_no port_no enable | disable ]
          [ -CCHS ctl_no port_no enable | disable ]
          [ -InquiryStandard ctl_no port_no enable | disable ]
          [ -ProdidDF400 ctl_no port_no enable | disable ]
          [ -HPUX2 ctl_no port_no enable | disable ]
          [ -HbaWwnReport ctl_no port_no enable | disable ]
          [ -NACA ctl_no port_no enable | disable ]
          [ -SUNCluster ctl_no port_no enable | disable ]
          [ -PRSV ctl_no port_no enable | disable ]
          [ -ftSRV1 ctl_no port_no enable | disable ]
          [ -ftSRV2 ctl_no port_no enable | disable ]
          [ -LinkSeparation enable | disable ]
          [ -DataStriping 16 | 32 | 64 ]
          [ -ProcessorFailures reset | shutdown ]
          [ -inquiryCommandQueue on | off ]
          [ -inquiryVendor string ]
          [ -inquiryProduct string ]
          [ -inquiryRomMicro string ]
          [ -inquiryRamMicro string ]
          [ -WebTitle string ]
          [ -CacheMode off | random ]
```

```
[ -PortTypeOption ctl_no port_no
                  ResetLipSignal | ResetLipProcess |
                  LipPortAllReset | TargetReset |
                  Reserve | LUReset | TPRLO
                  enable | disable ]
[ -ControllerIdentifer ctl_no enable | disable ]
[ -ControllerID ctl_no string1 ]
[ -Rs232cOutflow ctl_no off | normal | hitrac ]
[ -WriteVerifyExecution ctl_no on | off ]
[ -dhcp ctl_no enable | disable ]
[ -IPAddress ctl_no inet_addr ]
[ -SubnetMask ctl_no netmask ]
[ -DefaultGateway ctl_no gateway ]
[ -setMM ctl_no port_no hlu lu ]
[ -rmMM ctl_no port_no hlu lu ]
[ -fd on | off ]
```

- Description

  References the contents of system parameters or set the parameters.

- Options

Options	Description
`-unit unit_name`	This command specifies 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 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-refer`	References system parameters.
`-set`	Sets system parameters.

`-SystemStartup`
`Single |`
`DualIDTake |`
`DualNotIDTake |`
`HotIDTake |`
`HotNotIDTake`
	Specifies the configuration of an array unit.
	Single: Single
	DualIDTake: Dual active (with the taking over of SCSI ID)
	DualNotIDTake: Dual active (without the taking over of SCSI ID)
	HotIDTake: Hot standby (with the taking over of SCSI ID)
	HotNotIDTake: Hot standby (without the taking over of SCSI ID)

`-TakingID` `port_no ctl_no`	Specifies 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`	Specifies the data share mode. **used:** Uses the data share mode. **notUsed:** Does not use the data share mode.
`-SerialNumber` `string`	Specifies the last four digits of the manufacturing serial number of an array unit with numeric characters. **The number is reflected on the fiber version of WWN, so do not set any value except for the last four digits of the manufacturing serial number.** The default setting is the last four digits of the manufacturing serial number of an array unit.
`-DriveDetach` `enable | disable`	Specifies whether to set the drive blockade mode effective or ineffective. **enable:** Enables the drive blockade mode. **disable:** Disables the drive blockade mode.
`-MultipathController` `enable | disable`	Specifies whether or not to perform sequential judgment for each controller. **enable:** Sequential decision at the controller unit. **disable:** Sequential decision at the port unit.
`-PROCOM` `enable | disable`	Specifies whether to set the PROCOM mode effective or ineffective. **enable:** Enables the PROCOM mode. **disable:** Disables the PROCOM mode.

(Continued)

Options	Description
-ReportStatus enable | disable	Specifies whether to set the warning status reporting mode effective or ineffective. **enable:** Enables the warning status report. **disable:** Disables the warning status report.
-MultipathArrayUnit enable | disable	Specifies whether or not to perform sequential judgment for each array unit. **enable:** Sequential decision at array unit. **disable:** Sequential decision at port unit.
-LuCacheWarning enable | disable	Specifies whether or not to report a warning when the turbo LU function is set effective. **enable:** Reports the warning. **disable:** Does not report the warning.
-DataStriping 16 | 32 | 64	Specifies the data striping size. **16:** To treat as 16 kbyte. **32:** To treat as 32 kbyte. **64:** To treat as 64 kbyte.
-ProcessorFailures reset | shutdown	Specifies action when a processor failure occurs. **reset:** Resets the failure and restarts the controller. **shutdown:** Shuts down the array unit.
-inquiryAnsiVersion 2 | 3	Sets the ANSI version of standard INQUIRY data. **2:** SCSI2 **3:** SCSI3
-inquiryCommandQueue on | off	Specifies execution of command queuing of INQUIRY response information. **on:** Executes command queuing. **off:** Suppresses command queuing.
-inquiryVendor string	Specifies the vendor name of Inquiry response information in less than or equal to eight characters. If you want to enter NULL characters, enter "".
-inquiryProduct string	Specifies the product type of Inquiry response information in less than or equal to sixteen characters. If you want to enter NULL characters, enter "".
-inquiryRomMicro string	Specifies the ROM microprogram version of Inquiry response information in less than or equal to two characters. If you want to enter NULL characters, enter "".
-inquiryRamMicro string	Specifies the RAM microprogram version of Inquiry response information in less than or equal to two characters. If you want to enter NULL characters, enter "".
-CacheMode off | random | sequential |randseq	Specifies the method of allocating cache memory. **off:** Uses cache memory by the common allocation method. **random:** Uses it by allocating to the buffer for random read only. **sequential:** Uses it by allocating to the buffer for sequential read only. **randseq:** Uses it by allocating to the buffers for both random read and sequential read only.

(Continued)

Options	Description
-ControllerIdentifer ctl_no enable | disable	Specifies whether the controller identifier is valid or invalid. **ctl:** 0, 1 **enable/disable:** Valid/Invalid
-ControllerID ctl string1	Specifies the controller ID. **ctl:** 0, 1 **string1:** Controller ID (less than or equal to eight characters)
-LuSizeReport auto | not	Specifies the LU size to be reported to the host. Valid for the SCSI version only. **auto:** The LU size is automatically determined by the array unit. **not:** The LU size to be reported will be the fixed value that has been set by the user.
-PseudoResponse ctl_no busy | notReady	Sets the response mode for duration from power on until the controller gets ready (for the SCSI version). **ctl_no**: Controller number (0, 1) **busy**: Responds with Busy. **notReady:** Respond with Not Ready.
-SaveDataPointer ctl port nothing | data | cmd | datacmd	Specifies the request for the controller to report a Save Data Pointer to the host. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B, C, D) **nothing:** Does not report. **data:** Reports after transferring data. **cmd:** Reports after receiving a command. **datacmd:** Reports after transferring data and after receiving a command.
-sync ctl_no port_no standard | async | N5 | N10 | N13 | N20 | N33 | N40 | W10 | W20 | W26 | W40 | W66 | W80	Specifies the SCSI transfer rate of a port. When connecting the DF500, do not specify **N13**, **W26**, **N33**, and **W66**, because they are all not supported. **standard:** Sets to a value so as to match the transfer rate of an interface board mounted. **async:** Transfers in the mode in which synchronous transfer is not used. **N5:** Sets the maximum transfer rate to Narrow 5 [MB/s]. **N10:** Sets the maximum transfer rate to Narrow 10 [MB/s]. **N13:** Sets the maximum transfer rate to Narrow 13 [MB/s]. **N20:** Sets the maximum transfer rate to Narrow 20 [MB/s]. **N33:** Sets the maximum transfer rate to Narrow 33 [MB/s]. **N40:** Sets the maximum transfer rate to Narrow 40 [MB/s]. **W10:** Sets the maximum transfer rate to Wide 10 [MB/s]. **W20:** Sets the maximum transfer rate to Wide 20 [MB/s]. **W26:** Sets the maximum transfer rate to Wide 26 [MB/s]. **W40:** Sets the maximum transfer rate to Wide 40 [MB/s]. **W66:** Sets the maximum transfer rate to Wide 66 [MB/s]. **W80:** Sets the maximum transfer rate to Wide 80 [MB/s].

(Continued)

Options	Description
-WriteVerifyExecution ctl_no on | off	Specifies execution of a write & verify operation **ctl_no:** Controller No. (0, 1) **on:** Executes a write & verify operation. **off:** Does not execute a write & verify operation.
-Rs232cOutflow ctl_no off | normal | hitrac	Sets the mode of sending out error information onto RS232C. **ctl_no:** Controller No. (0, 1) **off:** Does not send out information. **normal:** Sends out information. **hitrac:** Sends out information in the HITRAC mode.
-dhcp ctl_no enable | disable	Specifies 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	Specifies the IP address. **ctl_no:** Controller number (0, 1) **inet_addr:** IP address (format xxx.xxx.xxx.xxx)
-SubnetMask ctl_no netmask	Specifies the subnet mask. **ctl_no:** Controller number (0, 1) **netmask:** Subnet mask (format xxx.xxx.xxx.xxx)
-DefaultGateway ctl_no gateway	Specifies the default gateway. **ctl_no:** Controller number (0, 1) **gateway:** Default gateway (format xxx.xxx.xxx.xxx)
-setSM ctl_no port_no tid	Sets the target ID by S-TID, M-LUN modes. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B, C, D) **tid:** Target ID
-rmSM ctl_no port_no tid	Deletes the target ID by S-TID, M-LUN modes. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B, C, D) **tid:** Target ID

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

(Continued)

Options	Description

`-setMS`
`ctl_no port_no`
`tid lu`
	Sets the target ID by M-TID, S-LUN modes.
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B, C, D)
	tid: Target ID
	lu: LU number

`-rmMS`
`ctl_no port_no`
`tid lu`
	Deletes the target ID by M-TID, S-LUN modes.
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B, C, D)
	tid: Target ID
	lu: LU number

`-setMM`
`ctl_no port_no`
`tid hlu lu`
	Sets the target ID by M-TID, M-LUN modes.
	(for the SCSI version)
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B, C, D)
	tid: Target ID
	hlu: LU number recognized by the host
	lu: LU number

`-rmMM`
`ctl_no port_no`
`tid hlu lu`
	Delete the target ID by M-TID, M-LUN modes.
	(for the SCSI version)
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B, C, D)
	tid: Target ID
	hlu: LU number recognized by the host
	lu: LU number

`-setMM`
`ctl_no port_no`
`hlu lu`
	Sets the target ID by M-TID, M-LUN modes.
	(for the Fibre version)
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B)
	hlu: LU number recognized by the host
	lu: LU number

`-rmMM`
`ctl_no port_no`
`hlu lu`
	Deletes the target ID by M-TID, M-LUN modes.
	(for the Fibre version)
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B)
	hlu: LU number recognized by the host
	lu: LU number

(Continued)

Options	Description
-fd on | off	Specifies whether or not to make a backup copy to the FD. System parameter information is already saved in the backup FD in an array unit. When settings are modified, the information must be saved again; be certain to specify **on**. **on:** Makes a backup copy. **off:** Does not make a backup copy.

For the 9200:

Options	Description
-HostConnection ctl_no port_no standard | OpenVMS | TRESPASS | WolfPack |	Specifies the mode to be emulated. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **standard:** Open system emulation mode **OpenVMS:** Open VMS mode **TRESPASS:** TRESPASS mode **WolfPack:** WolfPack mode
-DelayPlannedShutdown	Specifies 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.
-VxVM ctl_no port_no enable | disable	Specifies whether to set the VxVM mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the VxVM mode. **disable:** Disables the VxVM mode.
-OdeMapper ctl_no port_no enable | disable	Specifies whether to set the ODE Mapper mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the ODE Mapper mode. **disable:** Disables the ODE Mapper mode.
-HPUX ctl_no port_no enable | disable	Specifies whether to set the HP® connection mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the HP® connection mode. **disable:** Disables the HP® connection mode.
-NX enable | disable	Specifies 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	Specifies whether to set the auto reconstruction mode effective or ineffective. **enable:** Enables the auto reconstruction mode. **disable:** Disables the auto reconstruction mode.

(Continued)

Options	Description
-ForcedWriteThrough enable | disable	Specifies 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	Specifies 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.
-RAID3 enable | disable	Specifies whether to set the RAID3 mode effective or ineffective. **enable:** Enables the RAID3 mode. **disable:** Disables the RAID3 mode.
-HISUP ctl_no port_no enable | disable	Specifies whether to set the HISUP mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the HISUP mode. **disable:** Disables the HISUP mode.
-CCHS ctl_no port_no enable | disable	Specifies whether to set the CCHS convert mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the CCHS convert mode. **disable:** Disables the CCHS convert mode.
-InquiryStandard ctl_no port_no enable | disable	Specifies whether to set the Standard INQUIRY data expand mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the Standard INQUIRY data expand mode. **disable:** Disables the Standard INQUIRY data expand mode.
-ProdidDF400 ctl_no port_no enable | disable	Specifies whether to set the Product ID DF400 mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the Product ID DF400 mode. **disable:** Disables the Product ID DF400 mode.
-HPUX2 ctl_no port_no enable | disable	Specifies whether to set the HP® connection mode 2 effective or ineffective. **ctl_no:** Controller number (0, 1). **port_no:** Port number (A, B). **enable:** Enables the HP® connection mode 2. **disable:** Disables the HP® connection mode 2.
-HbaWwnReport ctl_no port_no enable | disable	Specifies whether to set the HBA WWN Report mode effective or ineffective. **ctl_no:** Controller number (0, 1). **port_no:** Port number (A, B). **enable:** Enables the HBA WWN Report mode. **disable:** Disables the HBA WWN Report mode.

(Continued)

Options	Description
-NACA ctl_no port_no enable | disable	Specifies whether to set the NACA mode effective or ineffective. **ctl_no:** Controller number (0, 1). **port_no:** Port number (A, B). **enable:** Enables the NACA mode. **disable:** Disables the NACA mode.
-SUNCluster ctl_no port_no enable | disable	Specifies whether to set the SUN Cluster Connection mode effective or ineffective. **ctl_no:** Controller number (0, 1). **port_no:** Port number (A, B). **enable:** Enables the SUN Cluster Connection mode. **disable:** Disables the SUN Cluster Connection mode.
-PRSV ctl_no port_no enable | disable	Specifies whether to set the Persistent RSV Cluster mode effective or ineffective. **ctl_no:** Controller number (0, 1). **port_no:** Port number (A, B). **enable:** Enables the Persistent RSV Cluster mode. **disable:** Disables the Persistent RSV Cluster mode.
-ftSRV1 ctl_no port_no enable | disable	Specifies whether to set the ftServer Connection mode 1 effective or ineffective. **ctl_no:** Controller number (0, 1). **port_no:** Port number (A, B). **enable:** Enables the ftServer Connection mode 1. **disable:** Disables the ftServer Connection mode 1.
-ftSRV2 ctl_no port_no enable | disable	Specifies whether to set the ftServer Connection mode 2 effective or ineffective. **ctl_no:** Controller number (0, 1). **port_no:** Port number (A, B). **enable:** Enables the ftServer Connection mode 2. **disable:** Disables the ftServer Connection mode 2.
-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.
-LinkSeparation enable | disable	Specifies whether to set the Link Separation effective or ineffective. **enable:** Enables the Link Separation. **disable:** Disables the Link Separation.
-ReportInquiry ctl_no port_no enable | disable	Specifies whether to set the Inquiry Page: 83 reporting mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the report of Inquiry Page: 83. **disable:** Disables the report of Inquiry Page: 83.

(Continued)

Options	Description

`-UASuppress`
`ctl_no port_no`
`enable | disable`
	Specifies whether or not to suppress a unit attention (06/2A00).
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B)
	enable: Suppress the unit attention.
	disable: Does not suppress the unit attention.

`-PortTypeOption`
`ctl_no port_no`
`ResetLipSignal |`
`ResetLipProcess |`
`LipPortAllReset |`
`TargetReset |`
`Reserve |`
`LUReset`
`TPRLO`
`enable | disable`
	For the Fibre Channel version of array units, sets options for individual ports.
	ctl_no: Controller No. (0, 1)
	port_no: Port No. (A, B, C, D)
	ResetLipSignal: Sets ResetLip (signal).
	ResetLipProcess: Sets ResetLip (processing).
	LipPortAllReset: Sets the resetting of all ports by an LIP.
	TargetReset: Enables the Target rest.
	Reserve: Enables the Reserve.
	LUReset:: Enables the LU reset.
	TPRLO: Sets Third Party Process Logout Mode.
	enable: Enables the settings described above.
	disable: Disables the settings described above.

- Examples of using commands:

  The following example references the system parameters of array unit df500a1.

  Example:

```
% ausysparam  -unit df500a1  -refer
Password:
System parameter list.

DF Name : df500a1
Date : 2002/01/15 13:00:00
Micro Program Revision : 055E
Flash Program Revision : 055E
Array Unit Type : DF500

---- Common Parameter ----
System Startup Attribute = Dual Active Mode
  SCSI ID/Port ID Take-over Mode = ---
  Default Controller
    Port A = ---
    Port B = ---
  Data Share Mode = Not Used
Host Connection Mode 1
  Port 0A = Standard Mode
  Port 0B = Standard Mode
  Port 1A = Standard Mode
  Port 1B = Standard Mode
Host Connection Mode 2
  Port 0A
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = ---
    HP Connection mode enable = OFF
    Report inquiry page 83H = OFF
    UA (06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
    Standard INQUIRY data expand mode = OFF
    HP Connection mode 2 enable = OFF
    Product ID DF400 mode = OFF
    HBA WWN Report Mode = OFF
    NACA Mode = OFF
    SUN Cluster Connection Mode = OFF
    Persistent RSV Cluster Mode = OFF
    ftServer Connection Mode 1 = OFF
    ftServer Connection Mode 2 = OFF
  Port 0B
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = ---
    HP Connection mode enable = OFF
    Report inquiry page 83H = OFF
    UA (06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
    Standard INQUIRY data expand mode = OFF
     HP Connection mode 2 enable = OFF
    Product ID DF400 mode = OFF
    HBA WWN Report Mode = OFF
    NACA Mode = OFF
    SUN CLuster Connection Mode = OFF
    Persistent RSV Cluster Mode = OFF
    ftServer Connection Mode 1 = OFF
    ftServer Connection Mode 2 = OFF
```

```
Port 1A
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = ---
    HP Connection mode enable = OFF
    Report inquiry page 83H = OFF
    UA (06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
    Standard INQUIRY data expand mode = OFF
    HP Connection mode 2 enable = OFF
    Product ID DF400 mode = OFF
    HBA WWN Report Mode = OFF
    NACA Mode = OFF
    SUN Cluster Connection Mode = OFF
    Persistent RSV Cluster Mode = OFF
    ftServer Connection Mode 1 = OFF
    ftServer Connection Mode 2 = OFF
  Port 1B
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = ---
    HP Connection mode enable = OFF
    Report inquiry page 83H = OFF
    UA (06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
    Standard INQUIRY data expand mode = OFF
    HP Connection mode 2 enable = OFF
    Product ID DF400 mode = OFF
    HBA WWN Report Mode = OFF
    NACA Mode = OFF
    SUN Cluster Connection Mode = OFF
    Persistent RSV Cluster Mode = OFF
    ftServer Connection Mode 1 = OFF
    ftServer Connection Mode 2 = OFF
Serial Number =
Delay Planned Shutdown =0
Option 1
  Drive Detach mode enable = OFF
Option 2
  Multipath (Controller) = OFF
  PROCOM mode enable = OFF
  Report status (normal / warning) = OFF
  Multipath (Array Unit) = OFF
  Turbo LU Warning = OFF
  NX Mode = OFF
  Auto Reconstruction Mode = OFF
  Forced Write Through Mode = OFF
  RAID3 Mode = OFF
Data Striping Size = 64KB
Operation if the Processor failures Occurs = Reset a Fault
INQUIRY Information
  Command Queuing = ON
  ANSI Version = ---
  Vendor ID = HITACHI
  Product ID = DF500F
  ROM Microprogram Version =
  RAM Microprogram Version =
Web Title
  Web Title = ""
Cache Mode = All OFF
Host Connection Mode
  Link Separation = OFF
```

```
---- CTL0 Parameter ----
Target ID
  S-TID,M-LUN : NO
  M-TID,S-LUN : NO
  M-TID,M-LUN : YES

  Data
  Port  Target ID  H-LUN  LUN
  0A       --         0    1
  0A       --         1    3
Port Type
  Port Option
    Reset/LIP Mode (Signal)
      Port A = OFF
      Port B = OFF
    Reset/LIP Mode (Process)
      Port A = OFF
      Port B = OFF
    LIP Port All Reset Mode
      Port A = OFF
      Port B = OFF
    Target Reset (Bus Device Reset) Mode
      Port A = OFF
      Port B = OFF
    Reserve Mode
      Port A = OFF
      Port B = OFF
    Logical Unit Reset Mode
      Port A = OFF
      Port B = OFF
    Third Party Process Logout Mode
      Port A = OFF
      Port B = OFF
ROM Pseudo-response command processing = ---
Save Data pointer response
  Port A = ---
  Port B = ---
Controller Identifier = Disable
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 = 00:00:87:70:9F:F3
SCSI transfer rate
  Port A = ---
  Port B = ---
```

```
---- CTL1 Parameter ----
Target ID
  S-TID,M-LUN : NO
  M-TID,S-LUN : NO
  M-TID,M-LUN : YES

  Data
  Port  Target ID  H-LUN  LUN
  1A       --         0    2
Port Type
  Port Option
    Reset/LIP Mode (Signal)
      Port A = OFF
      Port B = OFF
    Reset/LIP Mode (Process)
      Port A = OFF
      Port B = OFF
    LIP Port All Reset Mode
      Port A = OFF
      Port B = OFF
    Target Reset (Bus Device Reset) Mode
      Port A = OFF
      Port B = OFF
    Reserve Mode
      Port A = OFF
      Port B = OFF
    Logical Unit Reset Mode
      Port A = OFF
      Port B = OFF
    Third Party Process Logout Mode
      Port A = OFF
      Port B = OFF
ROM Pseudo-response command processing = ---
Save Data pointer response
  Port A = ---
  Port B = ---
Controller Identifier = Disable
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 = 00:00:87:70:9F:F3
SCSI transfer rate
  Port A = ---
  Port B = ---
--- Parameter ---
FD Back Up = YES
%
```

The following example sets a system parameter (to suppress the mode in which to send an error information to RS232C interface) for array unit df500a1.

Example:

```
% ausysparam  -unit df500a1  -set  -Rs232cOutflow off
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
System Parameter modification completed successfully.
Please reboot Array for changes to take effect.
%
```

The following example sets a system parameter (to set the buzzer on) for array unit df400a1, which supports restarting.

Example:

```
%ausysparam  -unit df400a1  -set  -Buzzer on
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
System Parameter modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

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, then execute the appropriate command.

3.7.2 Referencing/Setting RTC

- Command name

  `aurtc`

- Format

  ```
  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

Options	Description
`-unit unit_name`	Specifies the name of an array unit for which to reference and set RTC. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-refer`	References RTC.
`-set`	Sets the RTC.
`-auto`	Sets RTC by the date and time of the machine on which Resource Manager 9200 is running.
`-manual`	Sets to RTC the date and time specified by -date and -time options, respectively.
`-date yyyy/mm/dd`	Specifies the date to set. **yyyy:** in A.D. (1900 to 2089) **mm:** month (01 to 12) **dd:** day (01 to 31)
`-time HH:MM:SS`	Specifies the time to set. **HH:** hour (00 to 23) **MM:** minute (00 to 59) **SS:** second (00 to 59)

- Examples:

  The following example references RTC of array unit df500a1.

  Example:

```
% aurtc  -unit df500a1  -refer
Password:
Date 2001/05/10    Time 18:14:28
%
```

  The following example automatically sets RTC of array unit df500a1.

  Example:

```
% aurtc  -unit df500a1  -set  -auto
Password:
The RTC has been set successfully.
 %
```

  By specifying the date and time, the following example sets the RTC of array unit df400a1 which supports restarting.

  Example:

```
% aurtc  -unit df400a1  -set  -manual  -date 2000/01/01  -time 12:34:56
Continue (y/n [n]): y
This command will cause Array to stop communicating with all attached Hosts.
Password:
RTC modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

3.7.3 Referencing/Setting Target Information

- Command name

  ```
  autarget
  ```

- Format
  - 9200:

    ```
    autarget  -unit unit_name  -refer
    ```

  - 9200 (SCSI version):

    ```
    autarget -unit unit_name -set | -rm -mode SM
              -ctl0 | -ctl1 -port A -tid n [ -fd on | off ]
    autarget -unit unit_name -set | -rm -mode MS
              -ctl0 | -ctl1 -port A -tid n -lu lun [ -fd on | off ]
    autarget -unit unit_name -set | -rm -mode MM
              -ctl0 | -ctl1 -port A -tid n -hlu lun -lu lun [ -fd on | off ]
    ```

  - 9200:

    ```
    autarget  -unit unit_name  -file filename  [ -fd on | off ]
    ```

- Description

  The following example references and sets target ID information.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit for which to reference and set target ID information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-refer`	References target ID information.
`-set`	Adds target ID information.
`-rm`	Deletes target ID information.
`-mode SM | MS | MM`	Specifies individual types of a target ID and a LUN configuration. **SM:** Single target ID and multi-LUN (Sets the target ID for a port, and the host uses a LUN shared by the port for the same LUN.) **MS:** Multi-target ID and single LUN (Sets the port and target ID for a LUN, and the host uses a set target ID as LUN="0".) **MM:** LU mapping (Sets the port, target ID, and H-LUN for a LUN by mapping, and the host uses a set configuration)
`-ctl0 | -ctl1`	Specifies the controller number.
`-port A | B | C | D` `-port A | B`	Specifies the port number.
`-tid n`	Specifies the target ID for the SCSI version. This option cannot be specified to the fibre version.
`-hlu n`	Specifies the LUN recognized from the host.
`-lu n`	Specifies the internal LUN in the array unit.
`-file filename`	Specifies the configuration file of the target ID. If this option is specified, Configuration Manager 9200 reads a target ID configuration file, and sets the information according to the contents.
`-fd on | off`	Specifies whether or not to make a backup copy of the FD. Target ID information has been saved in the backup FD in the array unit as system parameter information. When changing settings, target ID information needs to be saved again, so be sure to specify "on".

- Examples:

  The following example displays the target ID information in array unit (SCSI version) df400a1. [S-TID, M-LUN]

  Example:

```
% autarget  -unit df400a1  -refer
Password:
Current target ID mode
   CTL0  S-TID, M-LUN
   CTL1  S-TID, M-LUN
CTL  PORT  T-ID  H-LUN  LUN
0    A     0     --     --
0    B     1     --     --
1    A     2     --     --
1    B     3     --     --
Reserved target ID mode
   CTL0  S-TID, M-LUN
   CTL1  S-TID, M-LUN
CTL  PORT  T-ID  H-LUN  LUN
0    A     0     --     --
0    B     0     --     --
1    A     0     --     --
1    B     0     --     --
%
```

  The following example displays the target ID information in array unit (SCSI version) df400b1. [M-TID, S-LUN]

  Example:

```
% autarget  -unit df400b1  -refer
Password:
Current target ID mode
   CTL0  M-TID, S-LUN
   CTL0  M-TID, S-LUN
CTL  PORT  T-ID  H-LUN  LUN
0    A     0     --     0
0    A     1     --     1
0    B     2     --     2
0    B     3     --     3
1    A     0     --     4
1    A     1     --     5
1    B     2     --     6
1    B     3     --     7
Reserved target ID mode
   CTL0  M-TID, S-LUN
   CTL1  M-TID, S-LUN
CTL  PORT  T-ID  H-LUN  LUN
0    A     0     --     0
0    A     2     --     1
0    B     4     --     2
0    B     6     --     3
1    A     1     --     4
1    A     3     --     5
1    B     5     --     6
1    B     7     --     7
%
```

The following example displays the target ID information in array unit (SCSI version) df400c1. [LU mapping]

Example:

```
% autarget  -unit df400c1  -refer
Password:
Current target ID mode
   CTL0  M-TID, M-LUN
   CTL1  M-TID, M-LUN

CTL  PORT  T-ID  H-LUN  LUN
0    A     0     0      0
0    B     1     2      4
1    A     2     0      1
1    B     3     2      5
Reserved target ID mode
   CTL0  M-TID, M-LUN
   CTL1  M-TID, M-LUN

CTL  PORT  T-ID  H-LUN  LUN
0    A     0     1      2
0    B     1     3      6
1    A     2     1      3
1    B     3     3      7
%
```

The following example displays the target ID information in array unit (Fibre version) df500a1. [LU mapping]

Example:

```
% autarget  -unit df500a1  -refer
Password:
Current target ID mode
   CTL0  M-TID, M-LUN
   CTL1  M-TID, M-LUN
CTL  PORT  T-ID  H-LUN  LUN
0    A     --    0      0
0    B     --    2      4
1    A     --    0      1
1    B     --    2      5
Reserved target ID mode
   CTL0  M-TID, M-LUN
   CTL1  M-TID, M-LUN
CTL  PORT  T-ID  H-LUN  LUN
0    A     --    1      2
0    B     --    3      6
1    A     --    1      3
1    B     --    3      7
%
```

The following example sets the target ID information in array unit (SCSI version) df400a1. The setting for the target ID of Controller 0, for Port A to 0 with a single target ID and multi-LUN configuration.

Example:

```
% autarget  -unit df400a1  -set -mode SM  -ctl0  -port A  -tid 0  -fd on
Password:
Target ID modification completed successfully.
Please reboot Array for changes to take effect.
%
```

The following example sets the target ID information in array unit (SCSI version) df400a2 and which supports restarting. The setting for the target ID of Controller 0, for Port A to 0 with a single target ID and multi-LUN configuration.

Example:

```
% autarget  -unit df400a2  -set -mode SM  -ctl0  -port A  -tid 0  -fd on
Password:
Target ID modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

The following example shows the format of the target ID configuration file when set by file input. Enter the **Target ID** by specifying "Yes" or "No". Enter necessary data for **Port**, **Target ID**, **H-LUN**, and **LUN**. Enter blank spaces between the items. If tabs are used, they are regarded as an input error and will be ignored.

Example 1: LU mapping mode

```
Information file for Target ID configuration

S-TID,M-LUN : NO
M-TID,S-LUN : NO
M-TID,M-LUN : YES

Data
Port  Target ID  H-LUN  LUN
 OA        0         0    0
 OA        0         1    1
 OA        0         2    2
 OA        0         3    3
 OA        0         4    4
 OA        0         5    5
 OA        0         6    6
 OA        0         7    7
 OB        1         0    8
 OB        1         1    9
 OB        1         2   10
 OB        1         3   11
 OB        1         4   12
 OB        1         5   13
 OB        1         6   14
 OB        1         7   15
```

Example 2: Single target ID and multi-LUN mode

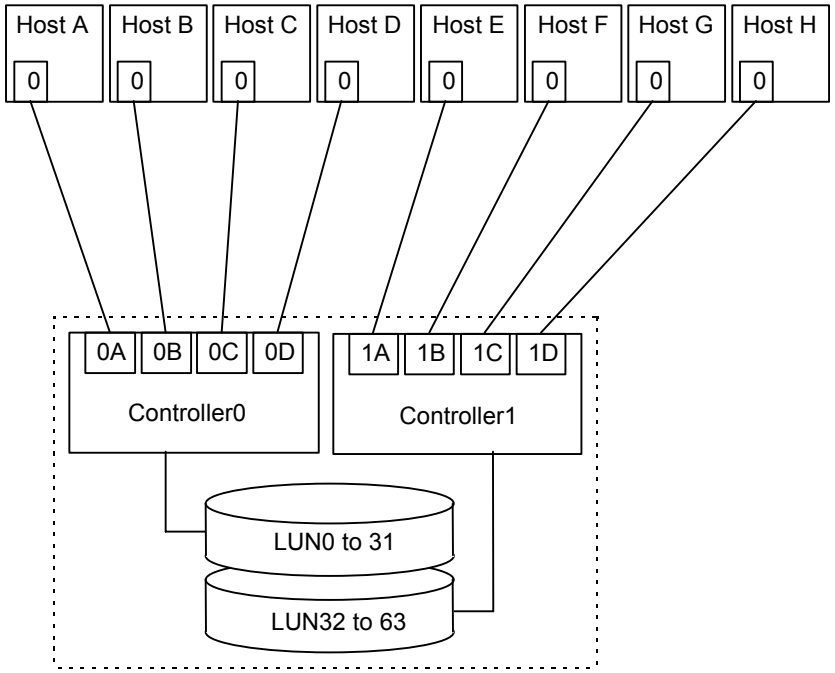
```
Information file for Target ID configuration

S-TID,M-LUN : YES
M-TID,S-LUN : NO
M-TID,M-LUN : NO

Data
Port  Target ID  H-LUN  LUN
 OA        0
 OB        1
 1A        2
 1B        3
```

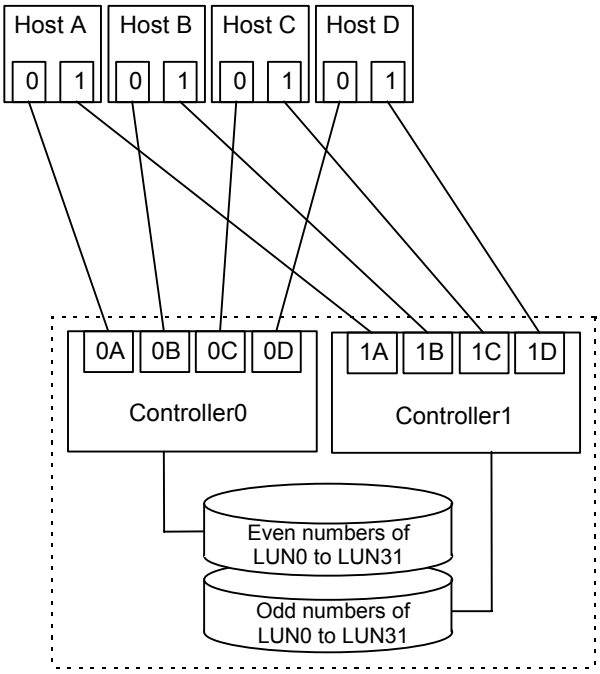
Note: When the Resource Manager 9200 is connected to array unit with the Fibre Channel connection, set '--' for the **T-ID**.

Two types of the sample files when setting by file input are provided. The sample file configuration is shown below.



Host	Port	Target ID	H-LUN	LUN
A	0A	0	0 to 7	0 to 7
B	0B	1	0 to 7	8 to 15
C	0C	2	0 to 7	16 to 23
D	0D	3	0 to 7	24 to 31
E	1A	0	0 to 7	32 to 39
F	1B	1	0 to 7	40 to 47
G	1C	2	0 to 7	48 to 55
H	1D	3	0 to 7	56 to 63

Figure 3.9 Sample File: id00.txt - - - Host LU Independent Access Type



Host	Port	Target ID	H-LUN	LUN
A-Path0	0A	0	0 to 7	0 to 7
A-Path1	0B	1	0 to 7	8 to 15
B-Path0	0C	2	0 to 7	16 to 23
B-Path1	0D	3	0 to 7	24 to 31
C-Path0	1A	0	0 to 7	0 to 7
C-Path1	1B	1	0 to 7	8 to 15
D-Path0	1C	2	0 to 7	16 to 23
D-Path1	1D	3	0 to 7	24 to 31

Figure 3.10 Sample File: id01.txt - - - Host LU Independent Access Type

3.7.4 Referencing/Setting LAN Information

- Command name

  aulan

- Format

  – 9200:

  ```
  aulan  -unit unit_name  -refer
  ```

  – 9200:

  ```
  aulan  -unit unit_name  -set  -ctl0 | -ctl1
         [ -addr inet_addr ]  [ -mask netmask ]  [ -gate gateway ]
         [ -dhcp enable | disable ]  [ -fd on | off ]
  ```

- Description

  This command displays and sets LAN information of the array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set LAN information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
-refer	References LAN information.
-set	Sets LAN information.
-ctl0 | -ctl1	Specifies the controller.
-addr inet_addr	Specifies the IP addresses.
-mask netmask	Specifies the subnet masks.

(Continued)

Options	Description
-gate gateway	Specifies individual default gateways.
-link enable | disable	Specifies whether LAN connection is valid or invalid.
-dhcp enable | disable	Specifies whether to set the DHCP mode to enable or disable.
-fd on | off	Specifies whether or not to make a backup copy of the FD. LAN information has been saved in the backup FD in the array unit as system parameter information. When changing settings, LAN information needs to be saved again; specify "on".

- Examples:

  The following example references the LAN information of array unit df500a1.

  Example:

```
% aulan  -unit df500a1  -refer
Password:
CTL  IP Address  Subnet mask    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 array unit df500a1.

  Example:

```
% aulan  -unit df500a1  -set  -ctl0
-addr 192.168.100.100  -mask 255.255.255.0  -gate 192.168.100.5
Password:
LAN information modification completed successfully.
Please reboot Array for changes to take effect.
%
```

  The following example sets LAN information for the Controller 0 side of array unit df400a1 and which supports remote restarting.

  Example:

```
% aulan  -unit df400a1  -set  -ctl0
-addr 192.168.100.100  -mask 255.255.255.0  -gate 192.168.100.5
Password:
LAN information modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

3.7.5 Referencing/Setting SCSI Transfer Rate

- Command name

  ausync

- Format

  – 9200:

  ```
  ausync  -unit unit_name  -refer
  ```

  – 9200:

  ausync -unit unit_name -set -ctl0 | -ctl1 -port A

  ```
  -sync standard | async | N5 | N10 | N20 | N40 |
  W10 | W20 | W40 | W80
  [ -fd on|off ]
  ```

- Description

  This command displays and sets the SCSI transfer rate of each port. When setting the SCSI transfer rate, only one command entry can be set per port.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set the SCSI transfer rate. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
-refer	References SCSI transfer rate information.
-set	Sets SCSI transfer rate information.
-ctl0 | -ctl1	Specifies the controller for which to set information.
-port A | B | C | D	Specifies the port for which to set information.
-sync standard | async | N5 | N10 | N13 | N20 | N33 | N40 | W10 | W20 | W26 | W40 | W66 | W80	Specifies the transfer rate of a port. When connecting the DF500, do not specify **N13**, **W26**, **N33**, and **W66**, because they are all not supported. **standard:** Sets the transfer rate so as to match that of a mounted interface board. **async:** Transfers in a mode in which synchronous transfer is not used. **N5, W10:** Maximum transfer rate: Narrow 5 [MB/s], Wide 10 [MB/s] **N10, W20:** Maximum transfer rate: Narrow 10 [MB/s], Wide 20 [MB/s] **N13, W26:** Maximum transfer rate: Narrow 13 [MB/s], Wide 26 [MB/s] **N20, W40:** Maximum transfer rate: Narrow 20 [MB/s], Wide 40 [MB/s] **N33, W66:** Maximum transfer rate: Narrow 33 [MB/s], Wide 66 [MB/s] **N40, W80:** Maximum transfer rate: Narrow 40 [MB/s], Wide 80 [MB/s]
-fd on | off	Specifies whether or not to make a backup copy of the FD. SCSI transfer rate information is saved in the backup FD in the array unit as system parameter information. When changing settings, SCSI transfer rate information needs to be saved again; specify "on".

- Examples:

  The following example references the SCSI transfer rate information of array unit df400a1.

  Example:

```
% ausync  -unit df400a1  -refer
Password:
CTL  Port  I/F board type  Velocity
0    A     no set          standard
0    B     no set          standard
0    C     no set          standard
0    D     differential    async
1    A     no set          standard
1    B     differential    5 (10) MB
1    C     no set          standard
1    D     no set          standard
%
```

  The following example sets SCSI transfer rate information for port A on the Controller 0 side of array unit df400a1.

  Example:

```
% ausync  -unit df400a1  -set  -ctl0  -port A  -sync standard  -fd on
Password:
SYNC CONTROL modification completed successfully.
Please reboot Array for changes to take effect.
%
```

  The following example sets SCSI transfer rate information for port A on the Controller 0 side of array unit df400a2 and which supports remote restarting.

  Example:

```
% ausync  -unit df400a2  -set  -ctl0  -port A  -sync standard  -fd on
Password:
SYNC CONTROL modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

3.7.6 Referencing/Setting the Port Option and Controller Identifier

- Command name

  auportop

- Format
  - For the 9200:

  ```
  auportop   -unit unit_name  -refer
  ```

  - SCSI version:

  ```
  auportop   -unit unit_name  -set
         [ -HostConnection ctl_no port_no
                          standard | OpenVMS | TRESPASS | WolfPack |
                           IBM7135 | NCR ]
         [ -VxVM ctl_no port_no enable | disable ]
         [ -OdeMapper ctl_no port_no enable | disable ]
         [ -ReportInquiry ctl_no port_no enable | disable ]
         [ -UASuppress ctl_no port_no enable | disable ]
         [ -HISUP ctl_no port_no enable | disable ]
         [ -CCHS ctl_no port_no enable | disable ]
         [ -InquiryStandard ctl_no port_no enable | disable ]
         [ -ProdidDF400 ctl_no port_no enable | disable ]
         [ -SUNCluster ctl_no port_no enable | disable ]
         [ -PRSV ctl_no port_no enable | disable ]
         [ -PortTypeOption ctl_no port_no
                         ResetLipSignal | ResetLipProcess |
                         TargetReset | Reserve enable | disable ]
         [ -ControllerID ctl_no string ]
         [ -fd on | off ]
  ```

– Fibre version:

```
auportop   -unit unit_name  -set
       [ -HostConnection ctl_no port_no
                        standard | OpenVMS | TRESPASS | WolfPack |
       [ -VxVM ctl_no port_no enable | disable ]
       [ -HPUX ctl_no port_no enable | disable ]
       [ -ReportInquiry ctl_no port_no enable | disable ]
       [ -UASuppress ctl_no port_no enable | disable ]
       [ -HISUP ctl_no port_no enable | disable ]
       [ -CCHS ctl_no port_no enable | disable ]
       [ -InquiryStandard ctl_no port_no enable | disable ]
       [ -HPUX2 ctl_no port_no enable | disable ]
       [ -ProdidDF400 ctl_no port_no enable | disable ]
       [ -HbaWwnReport ctl_no port_no enable | disable ]
       [ -NACA ctl_no port_no enable | disable ]
       [ - SUNCluster ctl_no port_no enable | disable ]
       [ -PRSV ctl_no port_no enable | disable ]
       [ -ftSRV1 ctl_no port_no enable | disable ]
       [ -ftSRV2 ctl_no port_no enable | disable ]
       [ -PortTypeOption ctl_no port_no
                       ResetLipSignal | ResetLipProcess |
                       LipPortAllReset | TargetReset |
                       Reserve | LUReset | TPRLO
                       enable | disable ]
       [ -ControllerID ctl_no string ]
       [ -fd on | off ]
```

- Description

  This command references and sets the port option of the system parameters and controller identifier online.

  The setting is allowed only if the Target ID mode of an array unit is set to [M-TID, M-LUN] (mapping). Additions to mapping information can be set for Target IDs that are not set.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit for which to reference and set system parameters. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-refer`	References system parameters.
`-set`	Sets system parameters.

`-HostConnection`
`ctl_no port_no`
`standard |`
`OpenVMS |`
`TRESPASS |`
`WolfPack |`
`IBM7135 |`
`NCR`
	Specifies the mode to be emulated.
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B)
	standard: Open system emulation mode
	OpenVMS: Open VMS mode
	TRESPASS: TRESPASS mode
	WolfPack: WolfPack mode
	IBM7135: IBM7135 mode
	NCR: NCR mode

`-VxVM`
`ctl_no port_no`
`enable | disable`
	Specifies whether to set the VxVM mode effective or ineffective.
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B)
	enable: Enables the VxVM mode.
	disable: Disables the VxVM mode.

`-OdeMapper`
`ctl_no port_no`
`enable | disable`
	Specifies whether to set the ODE Mapper mode effective or ineffective.
	ctl_no: Controller number (0, 1)
	port_no: Port number (A)
	enable: Enables the ODE Mapper mode.
	disable: Disables the ODE Mapper mode.

`-HPUX`
`ctl_no port_no`
`enable | disable`
	Specifies whether to set the HP® connection mode effective or ineffective.
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B)
	enable: Enables the HP® connection mode.
	disable: Disables the HP® connection mode.

(Continued)

Options	Description

`-ReportInquiry`
`ctl_no port_no`
`enable | disable`
	Specifies whether to set the Inquiry Page: 83 reporting mode effective or ineffective.
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B)
	enable: Enables the report of Inquiry Page: 83.
	disable: Disables the report of Inquiry Page: 83.

`-UASuppress`
`ctl_no port_no`
`enable | disable`
	Specifies whether or not to suppress a unit attention (06/2A00).
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B)
	enable: Suppress the unit attention.
	disable: Does not suppress the unit attention.

`-HISUP`
`ctl_no port_no`
`enable | disable`
	Specifies whether to set the HISUP mode effective or ineffective.
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B)
	enable: Enables the HISUP mode.
	disable: Disables the HISUP mode.

`-CCHS`
`ctl_no port_no`
`enable | disable`
	Specifies whether to set the CCHS convert mode effective or ineffective.
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B)
	enable: Enables the CCHS convert mode.
	disable: Disables the CCHS convert mode.

`-InquiryStandard`
`ctl_no port_no`
`enable | disable`
	Specifies whether to set the Standard INQUIRY data expand mode effective or ineffective.
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B)
	enable: Enables the Standard INQUIRY data expand mode.
	disable: Disables the Standard INQUIRY data expand mode.

`-HPUX2`
`ctl_no port_no`
`enable | disable`
	Specifies whether to set the HP® connection mode 2 effective or ineffective.
	ctl_no: Controller number (0, 1).
	port_no: Port number (A, B).
	enable: Enables the HP® connection mode 2.
	disable: Disables the HP® connection mode 2.

`-ProdidDF400`
`ctl_no port_no`
`enable | disable`
	Specifies whether to set the Product ID DF400 mode effective or ineffective.
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B)
	enable: Enables the Product ID DF400 mode.
	disable: Disables the Product ID DF400 mode.

(Continued)

Options	Description
-HbaWwnReport ctl_no port_no enable | disable	Specifies whether to set the HBA WWN Report mode effective or ineffective. **ctl_no:** Controller number (0, 1). **port_no:** Port number (A, B). **enable:** Enables the HBA WWN Report mode. **disable:** Disables the HBA WWN Report mode.
-NACA ctl_no port_no enable | disable	Specifies whether to set the NACA mode effective or ineffective. **ctl_no:** Controller number (0, 1). **port_no:** Port number (A, B). **enable:** Enables the NACA mode. **disable:** Disables the NACA mode.
-SUNCluster ctl_no port_no enable | disable	Specifies whether to set the SUN Cluster Connection mode effective or ineffective. **ctl_no:** Controller number (0, 1). **port_no:** Port number (A, B). **enable:** Enables the SUN Cluster Connection mode. **disable:** Disables the SUN Cluster Connection mode.
-PRSV ctl_no port_no enable | disable	Specifies whether to set the Persistent RSV Cluster mode effective or ineffective. **ctl_no:** Controller number (0, 1). **port_no:** Port number (A, B). **enable:** Enables the Persistent RSV Cluster mode. **disable:** Disables the Persistent RSV Cluster mode.
-ftSRV1 ctl_no port_no enable | disable	Specifies whether to set the ftServer Connection mode 1 effective or ineffective. **ctl_no:** Controller number (0, 1). **port_no:** Port number (A, B). **enable:** Enables the ftServer Connection mode 1. **disable:** Disables the ftServer Connection mode 1.
-ftSRV2 ctl_no port_no enable | disable	Specifies whether to set the ftServer Connection mode 2 effective or ineffective. **ctl_no:** Controller number (0, 1). **port_no:** Port number (A, B). **enable:** Enables the ftServer Connection mode 2. **disable:** Disables the ftServer Connection mode 2.
-PortTypeOption ctl_no port_no ResetLipSignal | ResetLipProcess | LipPortAllReset | TargetReset | Reserve | LUReset | TPRLO enable | disable	Sets options for individual ports for the Fibre Channel version of array units. **ctl_no:** Controller No. (0, 1) **port_no:** Port No. (A, B) **ResetLipSignal:** Sets ResetLip (signal). **ResetLipProcess:** Sets ResetLip (processing). **LipPortAllReset:** Sets the resetting of all ports by an LIP. **TargetReset:** Enables the Target rest. **Reserve:** Enables the Reserve. **LUReset:** Enables the LU reset. **TPRLO:** Sets Third Party Process Logout Mode. **enable:** Enables the settings described above. **disable:** Disables the settings described above.

(Continued)

Options	Description
`-ControllerID ctl string1`	Specifies the controller ID. **ctl:** 0, 1 **string1:** Controller ID (up to eight characters)
`-fd on | off`	Specifies whether or not to make a backup copy to the FD. System parameter information is already saved in the backup FD in an array unit. When settings are modified, the information must be saved again; be certain to specify “on”. **on:** Makes a backup copy. **off:** Does not make a backup copy.

- Examples:

The following example references the system parameters of array unit df500a1.

Example:

```
% auportop  -unit df500a1  -refer
Password:
Host Connection Mode 1
  Port 0A = Standard Mode
  Port 0B = Standard Mode
  Port 1A = Standard Mode
  Port 1B = Standard Mode

Host Connection Mode 2
VxVM DMP Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
HP Connection Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Report inquiry page 83H
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
UA(06/2A00) suppress Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
HISUP Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
CCHS Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Standard INQUIRY data expand Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
HP Connection Mode 2
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Product ID DF400 Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
HBA WWN Report Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
```

```
NACA Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
SUN Cluster Connection Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Persistent RSV Cluster Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
ftServer Connection Mode 1
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
ftServer Connection Mode 2
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Port Option
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
Reset All LIP Port Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Reset Target (Reset Bus Device) Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Reserve Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Reset Logical Unit Mode
  0A = disable
  0B = disable
  1A = disable
  1B = disable
Reset Logout of Third Party Process Mode
  0A = disable
  0B = disable
  1A = disable
  1B = disable
Controller Identifier
  CTL0 = DF500-00 C0
  CTL1 = DF500-00 C1
```

The following example sets the unit attention option "UA(06/2A00) suppress mode" by the system parameter for port A on the controller 0 side of array unit df500a1.

Example:

```
% auportop  -unit df500a1  -set –UASuppress 0 A enable
Password:
%
```

3.7.7 Setting Target Information Online

- Command name

  auontarget

- Format

  – SCSI version:

  ```
  auontarget  -unit unit_name  -add ctl_no port_no tid hlu lu [ -fd on | off ]
  auontarget  -unit unit_name  -chg ctl_no port_no tid hlu lu [ -fd on | off ]
  auontarget  -unit unit_name  -rm ctl_no port_no tid hlu lu [ -fd on | off ]
  ```

  – Fibre version:

  ```
  auontarget  -unit unit_name  -add ctl_no port_no hlu lu [ -fd on | off ]
  auontarget  -unit unit_name  -chg ctl_no port_no hlu lu [ -fd on | off ]
  auontarget  -unit unit_name  -rm ctl_no port_no hlu lu [ -fd on | off ]
  ```

- Description

  This command sets mapping information online.

  The setting is allowed only if the Target ID mode of an array unit is set to [M-TID, M-LUN] (mapping). Additions to mapping information can only be set for Target IDs that are already set.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit for which to reference and set system parameters. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".

`-add`
`ctl_no port_no`
`tid`
`hlu`
`lu`
	Adds the mapping information.
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B)
	tid: Target ID (Fibre version is unnecessary)
	hlu: LU number recognized by the host
	lu: LU number of the array unit

`-chg`
`ctl_no port_no`
`tid`
`hlu`
`lu`
	Changes the mapping information.
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B)
	tid: Target ID (Fibre version is unnecessary)
	hlu: LU number recognized by the host
	lu: LU number of the array unit

`-rm`
`ctl_no port_no`
`tid`
`hlu`
`lu`
	Deletes the mapping information.
	ctl_no: Controller number (0, 1)
	port_no: Port number (A, B)
	tid: Target ID (Fibre version is unnecessary)
	hlu: LU number recognized by the host
	lu: LU number of the array unit

`-fd on | off`	Specifies whether or not to make a backup copy of the FD.The mapping information is saved in the backup FD in the array unit as the system parameters information. When changing the settings, the mapping information needs to be saved again. Specify "on".

- Examples:

  The following example sets up an LU with an internal LUN 3 of array unit df500a1, as Controller 0, Port A, Target ID 1, and Host LUN 2.

  Example:

```
% auontarget  -unit df500a1  -add 0 A 1 2 3
Password:
%
```

  The following example changes the setup of an LU with an internal LUN 0 of array unit df500a1, to Controller 0, Port A, Target ID 1, and Host LUN 3.

  Example:

```
% auontarget  -unit df500a1  -chg 0 A 1 3 0
Password:
%
```

  The following example deletes the setup, as Controller 0, Port A, Target ID 1, and Host LUN 2, of an LU with an internal LUN 0 of array unit df500a1.

  Example:

```
% auontarget  -unit df500a1  -rm 0 A 1 2 0
Password:
%
```

3.8 File Output of Configuration and Configuration Setting by File

This section explains how to save the configuration information of the array unit in a text file, or to set its configuration using a text file. The configuration information saved in the text file is the status of the system parameters, and those of the constituent parts of the RAID/LU and the array unit. The configuration to be set is the system parameters and RAID/LU. The status of the constituent parts of the array unit 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 array units can be carried out, by saving a text file of the configuration from an array unit, and then by using the saved text file to set another array unit.

Editing a text file to set an array unit can be carried out, but it is suggested that this function be used only for the configuration of the same array unit. To change the configuration, carry it out by the individual functions.

3.8.1 File Output of the Configuration: System Parameters

- Command name

  ```
  ausyspout
  ```

- Format

  ```
  ausyspout  -unit unit_name  -file file_name
  ```

- Description

  This command outputs the contents of the setting for the system parameters set in the array unit in a specified file, in a text format.

- Options

Options	Description
`-unit unit_name`	Specifies 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 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-file file_name`	Specifies the name the file (path) to output the system parameters.

- Example:

  The following example outputs the setting information of the system parameters of array unit df500a1 in a file with the name: `sysprm.txt` in the directory where the Resource Manager 9200 is installed.

  Example:

```
% ausysypout  -unit df500a1  -file sysprm.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 Figure 3.7.

- File header
- Registration name with the Resource Manager 9200 of the array unit
- Output time (Time of the machine where the Resource Manager 9200 is installed)
- Microprogram revision
- Array unit type
- Common controller parameters
- Controller 0 parameters
- Controller 1 parameters
- Direction for FD backup

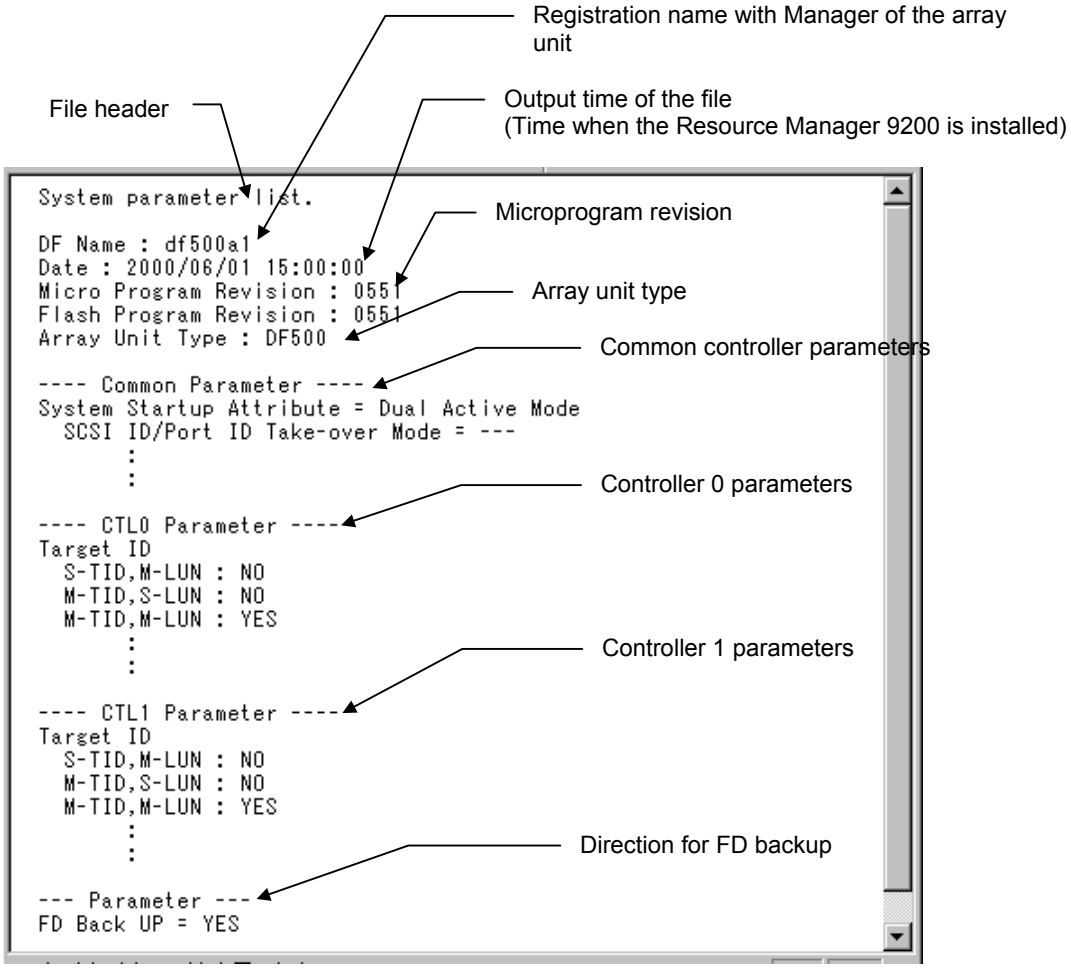


Figure 3.11 Outline of the Format of the System Parameter Output File

- Common Controller Parameters

  The common system parameters of the array unit are output. An output example of the system parameters of 9200 is shown in Figure 3.8.

```
---- Common Parameter ----
System Startup Attribute = Dual Active Mode
  SCSI ID/Port ID Take-over Mode = ---
  Default Controller
    Port A = ---
    Port B = ---
  Data Share Mode = Used
Host Connection Mode 1
  Port 0A = Standard Mode
  Port 0B = Standard Mode
  Port 1A = Standard Mode
  Port 1B = Standard Mode
Host Connection Mode 2
  Port 0A
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = OFF
    HP Connection mode enable = ---
    Report inquiry page 83H = ON
    UA(06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
  Port 0B
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = OFF
    HP Connection mode enable = ---
    Report inquiry page 83H = ON
    UA(06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
  Port 1A
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = OFF
    HP Connection mode enable = ---
    Report inquiry page 83H = ON
    UA(06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
  Port 1B
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = OFF
    HP Connection mode enable = ---
    Report inquiry page 83H = ON
    UA(06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
Serial Number =
Option 1
  Drive Detach mode enable = OFF
Option 2
  Multipath(Controller) = OFF
  PROCOM mode enable = OFF
  Report status (normal / warning) = OFF
  Multipath (Array Unit) = OFF
  Turbo LU Warning = OFF
Data Striping Size = 64KB
Operation if the Processor failures Occurs = Reset a Fault
INQUIRY Information
  Command Queuing = ON
  ANSI Version = ---
  Vendor ID =
  Product ID =
  ROM Microprogram Version =
  RAM Microprogram Version =
Web Title
  Web Title = ""
Cache Mode = All OFF
```

Figure 3.12 System Parameters: Output Example of Common Parameters

The common parameters are the items shown in Table 3.1.

Table 3.1 List of Common Parameters

No.	Parameter	Option
1	System Startup Attribute	-SystemStartup
	Single Mode	Single
	Dual Active Mode	DualIDTake
	Hot Standby Mode	DualNotIDTake
	SCSI ID/Port ID Take-over Mode	
	Used	HotIDTake
	Not Used	HotNotIDTake
	Default Controller	-TakingID
	Data Share Mode	-DataShare
2	Spare Disk	-SpareDisk
	One spare disk is valid	one
	Two spare disk is valid	two
	Spare disk not mounted	not
3	Host Connection Mode 1	-HostConnenction
	Standard Mode	standard
	Open VMS Mode	OpenVMS
	TRESSPASS Mode	TRESSPASS
	Wolfpack Mode	WolfPack
	IBM7135 I/O path switch emulation Mode	IBM7135
	NCR I/O path switch emulation Mode	NCR
4	Host Connection Mode 2	
	VxVM DMP mode enable	-VxVM
	ODE Mapper mode enable	-OdeMappar
	HP® Connection mode enable	-HPUX
	Report inquiry page 83H	-ReportInquiry
	UA (06/2A00) suppress mode enable	-UASuppress
	HISUP mode enable	-HISUP
	CCHS convert mode enable	-CCHS
	Standard INQUIRY data expand mode	-InquiryStandard
	HP® Connection mode 2 enable	-HPUX2
	Product ID DF400 mode	-ProdidDF400
	HBA WWN Report mode	-HbaWwnReport
	NACA mode	-NACA
	SUN Cluster Connection Mode	-SUNCluster
5	Serial Number	-SerialNumber
	Delay Planned Shutdown	-DelayPlannedShutdown
6	Drive Capacity (ROW LAST LBA)	-DriveCapacity

Table 3.1 List of Common Parameters (Continued)

No.	Parameter	Option
7	Option 1	
	VxVM DMP mode enable	-VxVM
	CLAM mode enable	-CLAM
	SUN Solaris2.5.1 mode enable	-Solaris
	Drive Detach mode enable	-DriveDetach
	MP5400 mode enable	-MP5400
	ODE Mapper mode enable	-OdeMappar
	HP® Connection mode enable	-HPUX
8	Option 2	
	Multi path (Controller)	-MultipathController
	Report inquiry page 83H	-ReportInquiry
	PROCOM mode enable	-PROCOM
	Report status (normal/warning)	-ResetStatus
	Multi path (Array Unit)	-MultipathArrayUnit
	Turbo LU Warning	-LuCacheWarning
	NX mode enable	-NX
	Auto Reconstruction mode enable	-AutoReconst
	Forced Write Through mode enable	-ForcedWriteThrough
	RAID3 Mode	-RAID3
	UA (06/2A00) suppress mode enable	-UASuppress
	SGI mode enable	-SGI
	Port-ID Taking-over enable	-PortIdTaking
9	Data Striping Size	-DataStriping
10	Buzzer	-Buzzer
11	LU size Report to the Host	-LuSizeReport
12	SCSI Reset/LIP Mode for all Ports	-ScsiResetLip
13	Operation if the Processor failures Occurs	-ProcessorFailures
14	INQUIRY Information	
	Command Queuing	-inquryCommandQueue
	ANSI Version	-inquryAnsiVersion
	Vendor ID	-inquryVendor
	Product ID	-inquryProduct
	ROM Microprogram Version	-inquryRomMicro
	RAM Microprogram Version	-inquryRammicro

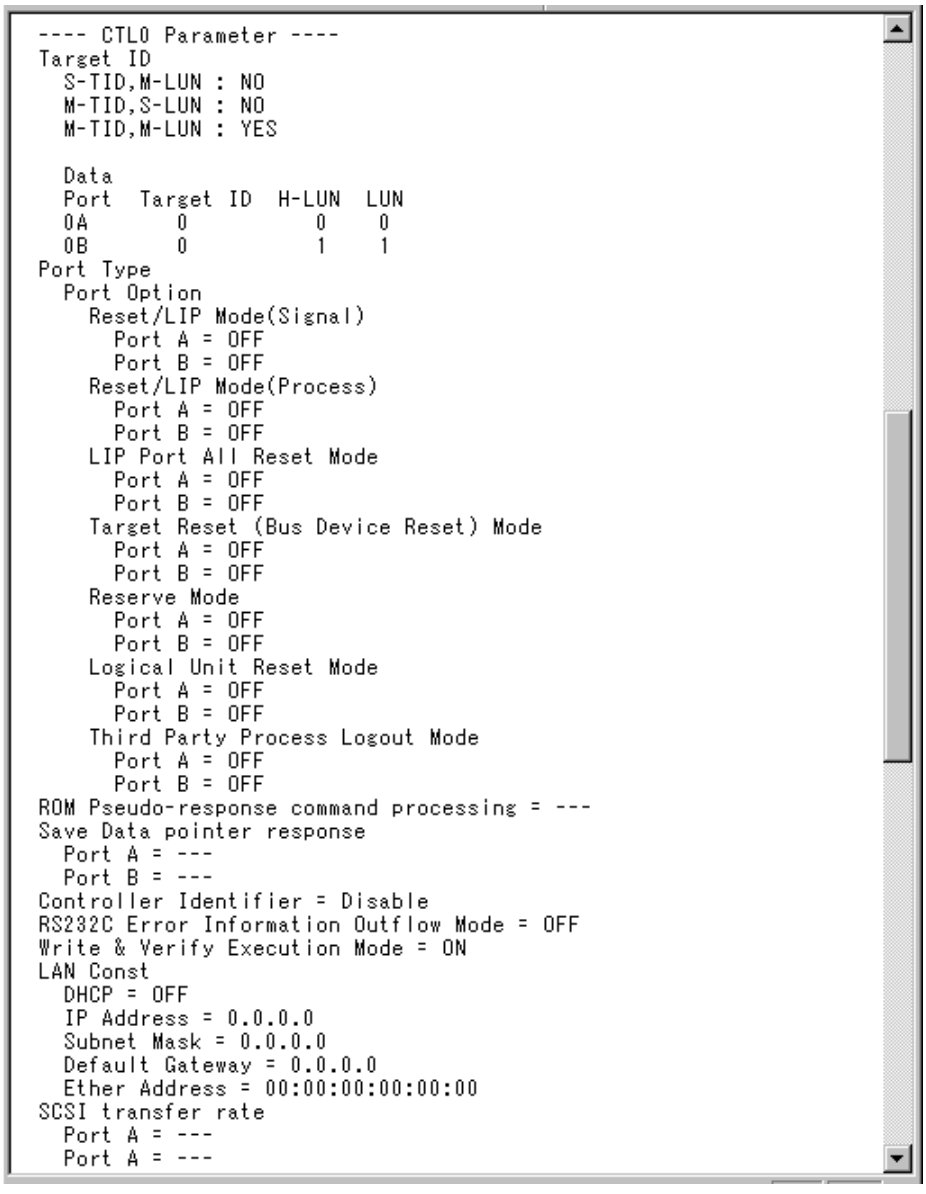
Table 3.1 List of Common Parameters (Continued)

No.	Parameter	Option
15	Cache Mode All OFF Random mode Sequential mode Random & Sequential mode	-CacheMode off random sequential randseq
16	Web Title	-WebTitle
17	Host Connection Mode Link Separation	 -LinkSeparation

Depending on the array unit in connection, there are items that do not need to be set, and these items will not be saved in the file. Moreover, if the value of an item in the parameters is given as "---" it is an item not supported in the configuration of the array unit.

- Controller 0 Parameters

  The parameters of controller 0 in the system parameters of the array unit that make the output are listed.



```
---- CTL0 Parameter ----
Target ID
  S-TID,M-LUN : NO
  M-TID,S-LUN : NO
  M-TID,M-LUN : YES

  Data
  Port  Target ID  H-LUN  LUN
  0A       0          0    0
  0B       0          1    1
Port Type
  Port Option
    Reset/LIP Mode(Signal)
      Port A = OFF
      Port B = OFF
    Reset/LIP Mode(Process)
      Port A = OFF
      Port B = OFF
    LIP Port All Reset Mode
      Port A = OFF
      Port B = OFF
    Target Reset (Bus Device Reset) Mode
      Port A = OFF
      Port B = OFF
    Reserve Mode
      Port A = OFF
      Port B = OFF
    Logical Unit Reset Mode
      Port A = OFF
      Port B = OFF
    Third Party Process Logout Mode
      Port A = OFF
      Port B = OFF
ROM Pseudo-response command processing = ---
Save Data pointer response
  Port A = ---
  Port B = ---
Controller Identifier = Disable
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
SCSI transfer rate
  Port A = ---
  Port A = ---
```

Figure 3.13 System Parameters: Output Example of Controller 0 Parameters

The parameters of controller 0 are the items shown in Table 3.2.

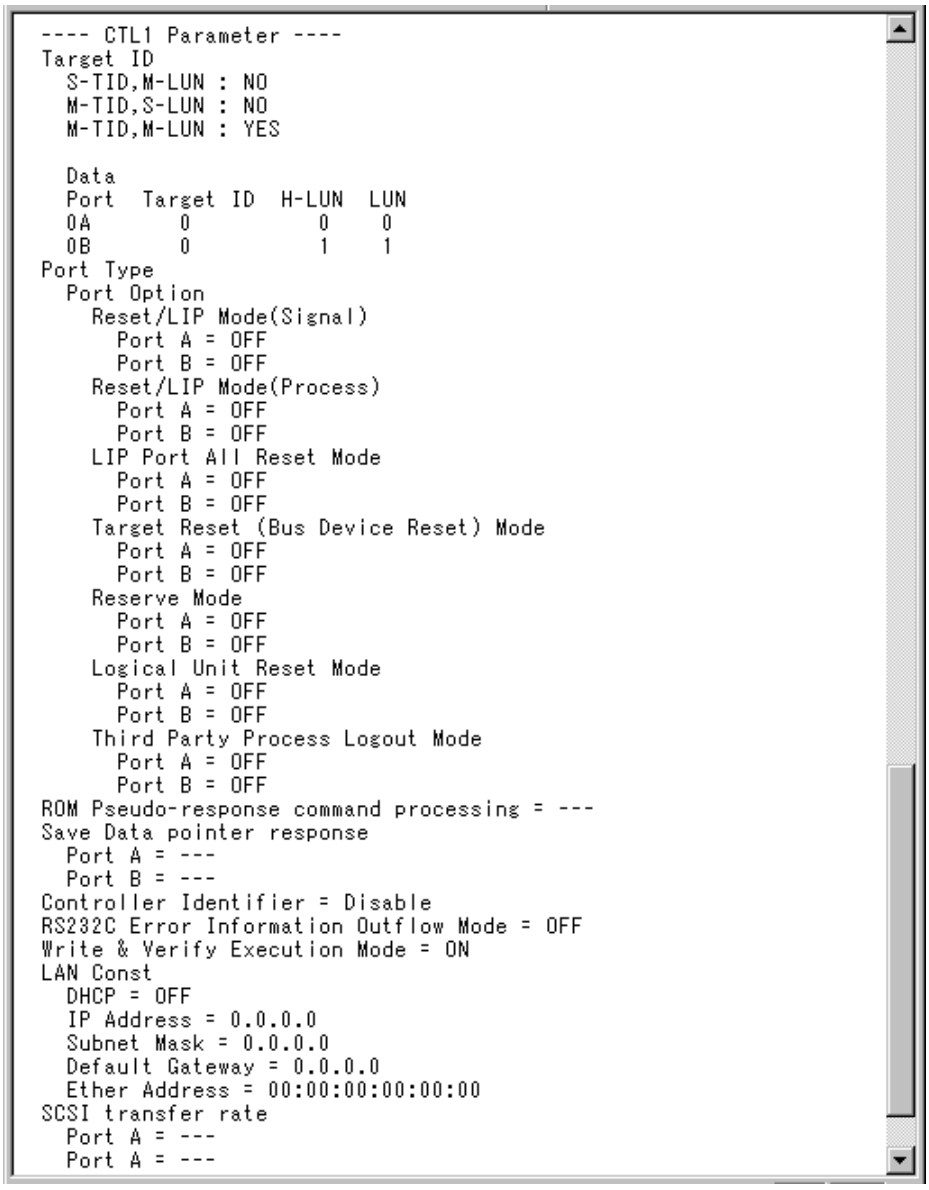
Table 3.2 List of Parameters of Controller 0

No.	Parameter	Option
1	Target ID	-setSM -rmSM -setMS -rmMS -setMM -rmMM
2	Port Type	-PortType -PortTypeResetLp
3	ROM Pseudo-response command processing	-PseudoResponse
4	Save Data pointer resource	-SaveDataPointer
5	Controller Identifier	-ControllerIdentifier -ControllerID
6	RS232C Error Information Outflow Mode	-Rs232cOutflow
7	Write & Verify Execution Mode	-WriteVerifyExecution
8	LAN Const	-ConnectLAN -dhcp -IPAddress -SubnetMask -DefaultGateway
9	SCSI transfer rate	-sync

Depending on the array unit in connection, there are items that do not need to be set, and these items will not be saved in the file. Moreover, if the value of an item in the parameters is given as "---" it is an item not supported in the configuration of the array unit.

- Controller 1 Parameters

  The parameters of controller 1 in the system parameters of the array unit that make the output are output.



```
---- CTL1 Parameter ----
Target ID
  S-TID,M-LUN : NO
  M-TID,S-LUN : NO
  M-TID,M-LUN : YES

  Data
  Port  Target ID  H-LUN  LUN
  0A       0          0    0
  0B       0          1    1
Port Type
  Port Option
    Reset/LIP Mode(Signal)
      Port A = OFF
      Port B = OFF
    Reset/LIP Mode(Process)
      Port A = OFF
      Port B = OFF
    LIP Port All Reset Mode
      Port A = OFF
      Port B = OFF
    Target Reset (Bus Device Reset) Mode
      Port A = OFF
      Port B = OFF
    Reserve Mode
      Port A = OFF
      Port B = OFF
    Logical Unit Reset Mode
      Port A = OFF
      Port B = OFF
    Third Party Process Logout Mode
      Port A = OFF
      Port B = OFF
ROM Pseudo-response command processing = ---
Save Data pointer response
  Port A = ---
  Port B = ---
Controller Identifier = Disable
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
SCSI transfer rate
  Port A = ---
  Port A = ---
```

Figure 3.14 System Parameters: Output Example of the Parameters of Controller 1

The parameters of controller 1 are the items shown in Table 3.3.

Table 3.3 List of Parameters of Controller 1

No.	Parameter	Option
1	Target ID	-setSM -rmSM -setMS -rmMS -setMM -rmMM
2	Port Type	-PortType -PortTypeResetLp
3	ROM Pseudo-response command processing	-PseudoResponse
4	Save Data pointer resource	-SaveDataPointer
5	Controller Identifier	-ControllerIdentifier -ControllerID
6	RS232C Error Information Outflow Mode	-Rs232cOutflow
7	Write & Verify Execution Mode	-WriteVerifyExecution
8	LAN Const	-ConnectLAN -dhcp -IPAddress -SubnetMask -DefaultGateway
9	SCSI transfer rate	-sync

Depending on the array unit in connection, there are items that do not need to be set, and these items will not be output in the file. Moreover, if the value of an item in the parameters is given as "---" it is an item not supported in the configuration of the array unit.

- Controller 1 Parameters

  The parameters of controller 1 in the system parameters of the array unit that make the output are listed.

```
---- Parameter ----
FD Back Up = YES
```

Figure 3.15 Output Example for FD Backup Specification

3.8.2 File Output of the Configuration: the Status of RAID/LU and Constituent Parts

- Command name

  `auconfigout`

- Format

  `auconfigout -unit unit_name -file file_name`

- Description

  This command outputs the RAID/LU configuration information already set in an array unit in specified file in a text format.

- Options

Options	Description
`-unit unit_name`	Specifies the name of the array unit that outputs the RAID/LU information file. Specifies with one-byte coded alphanumeric characters and special symbols "-(minus)" and "_(underline)" of up to 16 characters long.
`-file file_name`	Specifies the name of a file (path) into which to output configuration information.

- Examples:

  The following example outputs RAID/LU configuration information of array unit df500a1, by the file name: `config.txt`, into a directory in which the Resource Manager 9200 has been installed.

  Example:

```
% auconfigout -unit df500a1 -file config.txt
%
```

The format of the output file consists of the following items. The outline of the layout of the output file is shown in Figure 3.12. Figure 3.12 is the outline of the layout of the output file for the 9200.

- File header
- Registration name at the Resource Manager 9200 of the array unit
- Output time (Time of the machine where the Resource Manager 9200 is installed)
- Microprogram revision
- Array unit type
- RAID/LU configuration
- Status of constituent parts

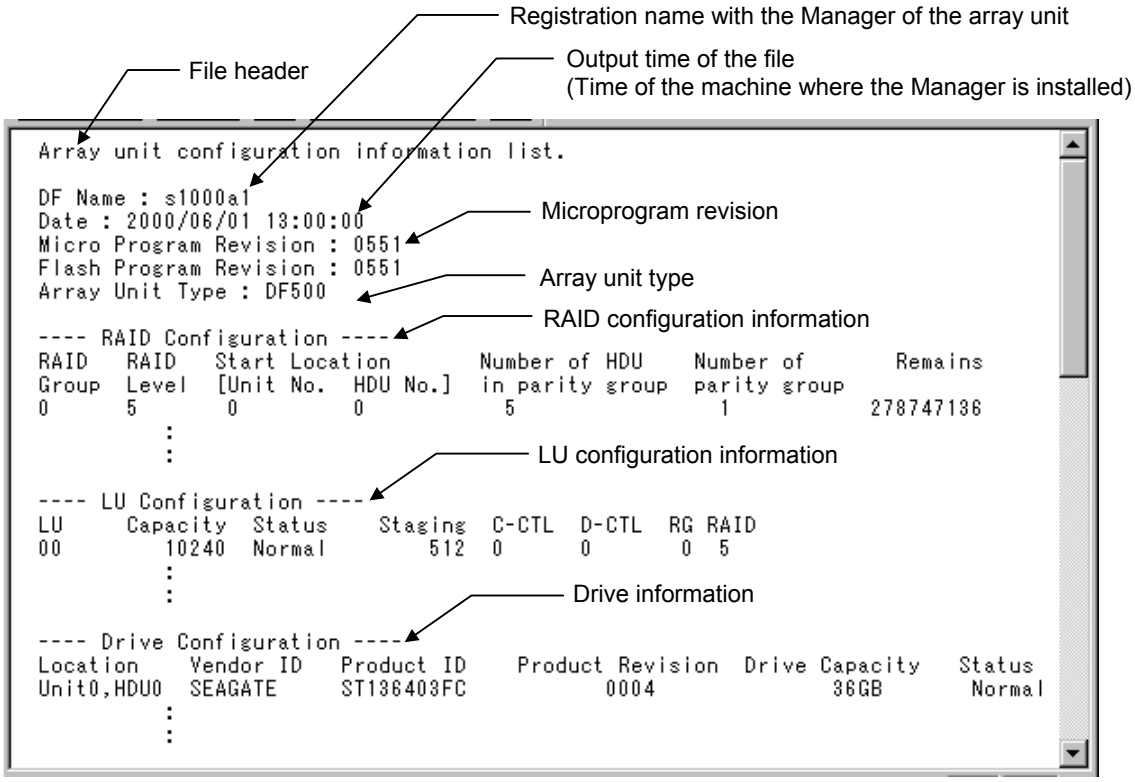


Figure 3.16 The Outline of the Format of RAID/LU Configuration Information Output File

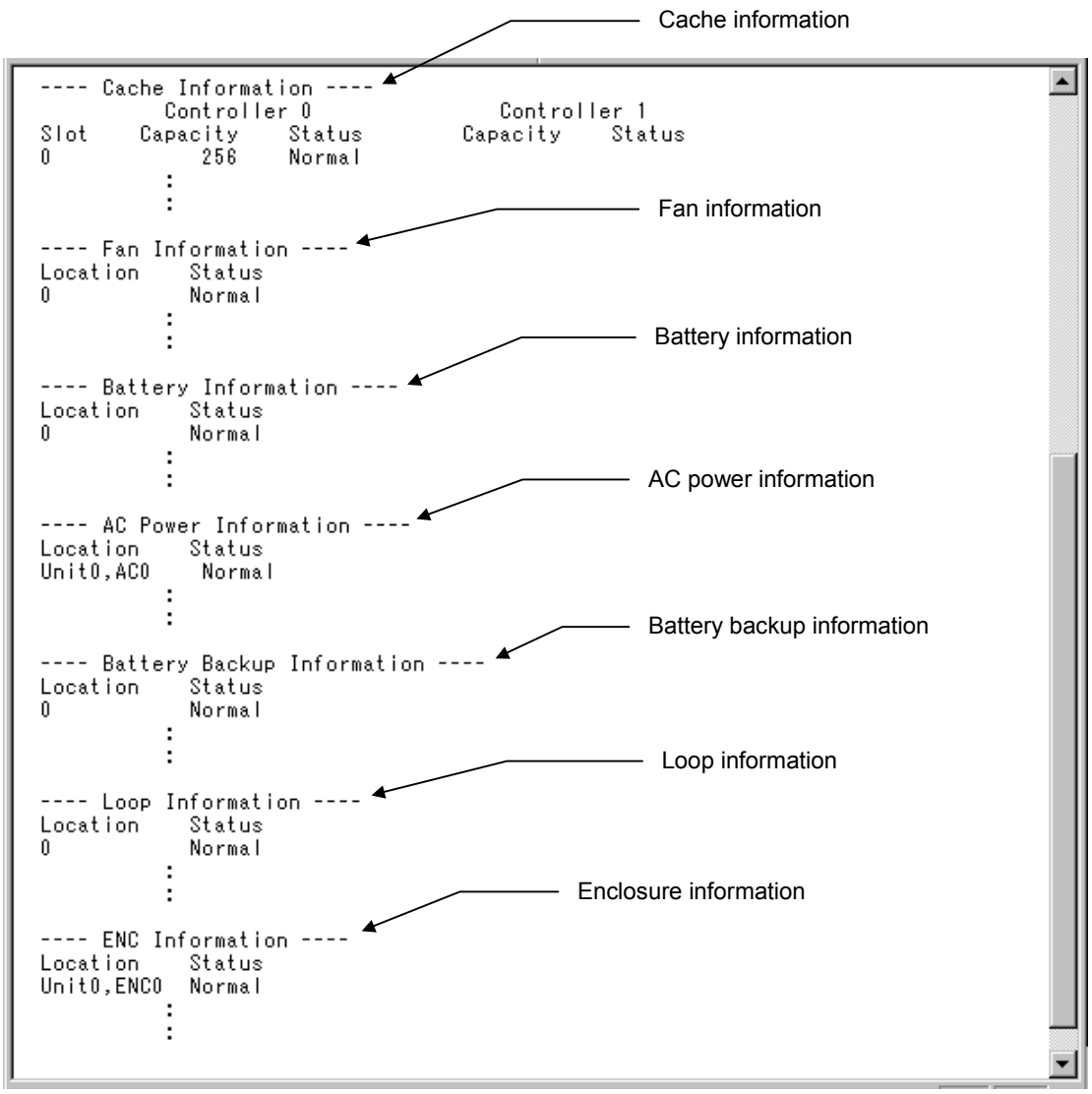


Figure 3.16 The Outline of the Format of RAID/LU Configuration Information Output File (Continued)

- Format of RAID configuration information

  The function outputs the RAID configuration of the array unit. RAID groups which have not been created are displayed as "-" in the "Level" column.

  For 9200:

Example:

```
---- RAID Configuration ----
RAID   RAID   Start Location       Number of HDU    Number of       Remains
Group  Level  [Unit No.  HDU No.]  in parity group  parity group
0      5       0          0          5                1            278747136
1      5       0          5          5                1            278747136
          :
          :
18     -
19     -
```

  - **RAID Group:** RAID group number
  - **RAID Level:** RAID level
    When no RAID is set, "-" is displayed. No other information is displayed.
  - **Start Location:**

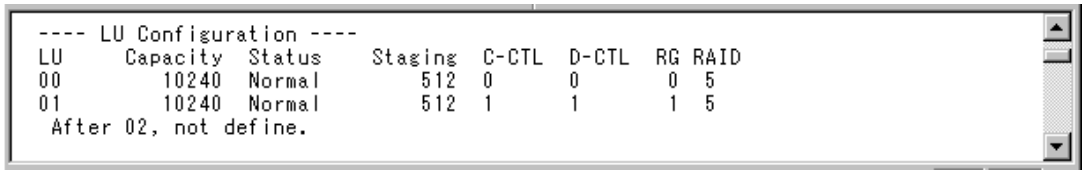
    Unit No.: Starting unit number of RAID group

    HDU No.: Starting HDU number of RAID group
  - **Number of HDU in parity group:** The number of HDU in the parity group of the RAID group
  - **Number of parity group:** The number of parity groups in the RAID group
  - **Remains:** The capacity [Block] that can be defined by LU of the RAID group

- Formatting LU configuration information

  The LU configuration of the array unit is listed. The information is displayed up to the created LU numbers.

Example:



```
---- LU Configuration ----
LU     Capacity  Status    Staging  C-CTL  D-CTL  RG RAID
00        10240  Normal        512  0      0       0  5
01        10240  Normal        512  1      1       1  5
 After 02, not define.
```

  - **LU:** LU number
  - **Capacity:** LU capacity (in units of block)
  - **Status:** The status of the LU

    Normal: Normal status in which the LU is defined and formatted

    Unformat: Status in which the LU is defined but not formatted

    Detached: Status in which the LU is blocked

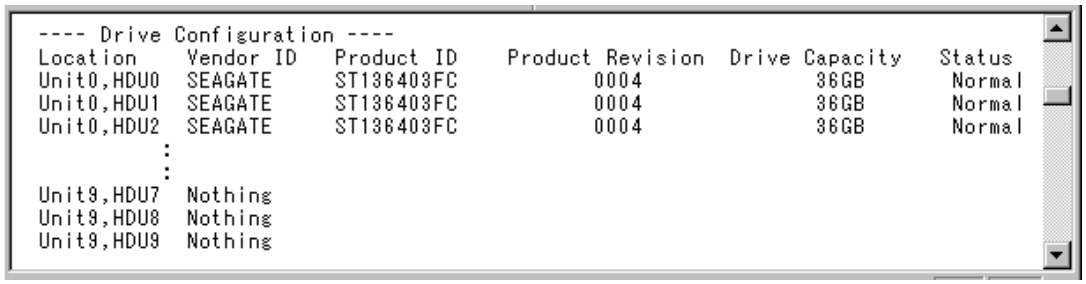
    Regressed: Status in which the LU is regressed
  - **Staging Size:** Pre-read data amount (in units of block)
  - **C-CTL:** The number of the controller currently in use
  - **D-CTL:** Default number of controller controlling the LU
  - **RG:** The number of the RAID group that creates the LU
  - **RAID:** The RAID level of the RAID group that creates the LU

- Format for Drive Information

  The information and status of the drive of the array unit are listed.

  For the 9200:

Example:



```
---- Drive Configuration ----
Location    Vendor ID   Product ID    Product Revision  Drive Capacity   Status
Unit0,HDU0  SEAGATE     ST136403FC          0004              36GB       Normal
Unit0,HDU1  SEAGATE     ST136403FC          0004              36GB       Normal
Unit0,HDU2  SEAGATE     ST136403FC          0004              36GB       Normal
          :
          :
Unit9,HDU7  Nothing
Unit9,HDU8  Nothing
Unit9,HDU9  Nothing
```

  - **Location:** The installation location of the drive
  - **Vendor ID:** The vendor ID of the drive
  - **Product ID:** The product ID of the drive
  - **Product Revision:** Firmwave revision of the drive
  - **Drive Capacity:** The capacity of the drive
  - **Status:** The status of the drive

    Normal: Normal (RAID, LU defined)

    Detached: Detached

    Standby: Normal (LU undefined)

    Undefine: Normal (RAID undefined)

    Recon.: Reconfiguring (copying from collection or backup)

  "Nothing" is shown after **Location** for the location of a HDU not installed.

- Format for Cache Information

  The configuration information and status of the cache of the array unit are listed.

Example:

```
---- Cache Information ----
          Controller 0              Controller 1
Slot    Capacity    Status        Capacity    Status
0            256    Normal             256    Normal
1            256    Normal             256    Normal
2           None    Nothing           None    Nothing
3           None    Nothing           None    Nothing
```

  - **Slot:** The installation location of the cache

  Controller 0

  - **Capacity:** The capacity [Mbyte] of the cache of controller 0
  - **Status:** The status of the cache of controller 0

    Normal: Normal

    Detached: Detached

    Nothing: Not installed

    ---: Slot not supported

  Controller 1

  - **Capacity:** The capacity [Mbyte] of the cache of controller 1
  - **Status:** The status of the cache of controller 1

    Normal: Normal

    Detached: Detached

    Nothing: Not installed

    ---: Slot not supported

- Format for Fan Information

  The status of the fan of the array unit is output.

Example:

```
---- Fan Information ----
Location    Status
0           Normal
```

  - **Location:** The installation location of the fan
  - **Status:** The status of the fan

    Normal: Normal

    Alarm: Abnormal

    Nothing: Not installed

- Format for Battery Information

  The status of the battery of the array unit is output.

Example:

```
---- Battery Information ----
Location    Status
0           Normal
```

  - **Location:** The installation location of the battery
  - **Status:** The status of the battery

    Normal: Normal

    Alarm: Abnormal

    Nothing: Not installed

- Format for AC Power Information: for connection with the 9200:

  The status of the AC power supply of the array unit is output.

  For the 9200:

Example:

```
---- AC Power Information ----
Location    Status
Unit0,AC0    Normal
Unit0,AC1    Normal
           :
           :
Unit9,AC0    Nothing
Unit9,AC1    Nothing
```

  - **Location:** The installation location of the A.C. power supply
  - **Status:** The status of the A. C. power supply

    Normal: Normal

    Alarm: Abnormal

    Nothing: Not installed

- Format for Battery Backup Status Information: for connection with the 9200:

  The status of the battery backup circuit of the array unit is output.

Example:

```
---- Battery Backup Information ----
Location    Status
0           Normal
1           Normal
```

  - **Location:** The installation location of the battery backup circuit
  - **Status:** The status of the battery backup circuit

    Normal: Normal

    Alarm: Abnormal

- Format for Loop Information: for connection with 9200:

  The status of the loop of the array unit is output.

Example:

```
Location    Status
0           Normal
1           Normal
2           Normal
3           Normal
```

  - **Location:** The installation location of the loop
  - **Status:** The status of the loop

    Normal: Normal

    Alarm: Abnormal

    Nothing: Not installed

- Format for Enclosure Information: for connection with 9200:

  The status of the enclosure of the array unit is output.

Example:

```
---- ENC Information ----
Location    Status
Unit0,ENC0  Normal
Unit0,ENC1  Normal
          :
          :
Unit9,ENC0  Nothing
Unit9,ENC1  Nothing
```

  - **Location:** The installation location of the enclosure
  - **Status:** The status of the enclosure

    Normal: Normal

    Alarm: Abnormal

    Nothing: Not installed

3.8.3 Setting the Configuration from a File: System Parameters

- Command name

  ```
  ausyspset
  ```

- Format

  ```
  ausyspset  -unit unit_name  -file file_name
  ```

- Description

  This command sets the contents of the system parameters described in a file to the array unit.

  If you set the file that was output under the condition in which any fee-based optional feature is in an unlocked (installed) statues, 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 unit. 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 **3.8.1 File Output of the Configuration: System Parameters**.
  - For setting items, see Subsection **3.7.1 Referencing/Setting System Parameters**, and Subsection **3.8.1 File Output of the Configuration: System Parameters**.

  For setting items for backup in system parameter information, the set system parameters must be saved into the backup FD in an array unit, and hence be sure to specify "Yes".

  For connection with a dual system, setting will not be carried out if one of the controllers is detached. Confirm that the array unit is not in warning status before using it.

  When executing the command, an array unit is disabled to execute commands from both the host and the Resource Manager 9200. In addition, to make the set system parameters effective, restart an array unit. Until the unit is restarted up, the previous settings remain effective.

  After setting is finished, restart an array unit, make sure that the unit has started up, and then connect the unit to the host and the Resource Manager 9200. After initiating the restarting of an array unit, the unit is not ready to accept I/O requests from the host until restarting is complete.

- Options

Options	Description
`-unit unit_name`	Specifies 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 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-file file_name`	Specifies the name of the file (path) to input the configuration information.

- Examples:

  The following example sets array unit df400a1 according to the configuration system parameters described in the text file: `sysprm.txt`.

  Example:

```
% ausyspset  -unit df400a1  -file sysprm.txt
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
System parameter modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

  The following example sets array unit df500a1 according to the configuration system parameters described in text file: `sysprm.txt`.

  Example:

```
% ausyspset  -unit df500a1  -file sysprm.txt
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
System parameter modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

3.8.4 Setting the Configuration from a File: RAID/LU Definition

- Command name

  ```
  auconfigset
  ```

- Format

  ```
  auconfigset  -unit unit_name  -file file_name
  ```

- Description

  This command sets the RAID/LU setting information described in the file to the array unit.
  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 unit. For the file format, see the following:

  – Subsection **3.8.2 File output of the configuration: the status of RAID/LU and 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 an RAID configuration.
  Specifies the RAID level, the RAID group No., and the RAID size.
  For RAID groups that are not set up, enter "-" for "Level", and other items are not set.

  LU configuration information: Sets up an LU configuration.
  Specifies the LU No., the LU capacity, the amount of data pre-read, the No. of the current controller controlling an LU, the No. of the default controller controlling an LU, the RAID group No., 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 group is allocated to one LU in the group, specifies "All" for "Capacity".

  Although "0" or "1" is specified for the No. of the current controller controlling an LU, the current controller No. is set to the same as the No. of the default controller controlling an LU.

  When setting up LUs less than the maximum, specify "After nn, not define" (nn: the last LU No. + 1) at the end.

Drive information: Sets up the configuration of HDUs mounted in array unit for which to set drive information.
Specifies the drive capacity. Other items are not set, but the items are listed.
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 set up.

- Options

Options	Description
`-unit unit_name`	Specifies the name of the array unit to be set with the RAID/LU configuration. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-file file_name`	Specifies the name of the file (path) to input the configuration information.

- Example:

  The following example sets array unit df500a1 according to the RAID/LU configuration described in text file: `config.txt`.

  Example:

```
% auconfigset  -unit df500a1  -file config.txt
The new RAID/LU configuration will be set in array unit.
When setup process starts, current RAID/LU configuration will be deleted.
Are you sure (y/n [n]): y
Password:
RAID configuration setting start.
RAID configuration setting complete.
LU configuration setting start.
LU configuration setting complete.
LUx format start
LUy format start
LUx format end : Normal Terminated
LUz format start
LUx format end : CHECK CONDITION : xx-xxxx
        :
        :
%
```

3.9 Microprogram Replacement

3.9.1 Downloading/Replacing Microprogram

- Command name

  `aumicro`

- Format
  - 9200:

  ```
  aumicro  -unit unit_name  -upload  -time time  -check on | off
  aumicro  -unit unit_name  -change  -ctl0 | -ctl1
  ```

- Description

  This command downloads a microprogram into the array unit. Additionally, it replaces the current microprogram with a downloaded microprogram.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit whose microprogram to download and replace. Specifies with one-byte coded alphanumeric characters and special symbols "-(minus)" and "_(underline)" of up to 16 characters long.
`-read`	Reads a microprogram onto the Resource Manager 9200.
`-path disk01 disk02 disk03 ...`	Specifies sequentially the path names to individual directories in which each FD file of a microprogram to be downloaded is stored.
`-fpath disk01`	Specifies the path name of the directory which stored disk 01 file of microprogram to download.
`-upload`	Downloads a microprogram into an array unit.
`-time time`	Specifies the time interval (1 to 60 seconds) at which to download a microprogram.
`-check on | off`	Specifies whether or not to check the revision of a microprogram.
`-change`	Replaces a microprogram.
`-ctl0 | -ctl1`	Specifies the controller whose microprogram is to be replaced.
`-revision`	Displays the revision of a microprogram which is to be replaced.
`-clean`	Deletes the read-in microprogram read.

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 a microprogram into array unit df500a1 and afterward performs the microprogram replacement.

  This example checks the revision of a microprogram of array unit df500a1 when downloading it.

  Example:

```
% aurev  -unit df500a1
Serial Number : 0777
Microprogram Revision : 0500
%
```

  This example first reads in a microprogram to be downloaded. The microprogram is stored in several floppy disks. This example shows that the contents of the floppy disk are stored in directories disk01, disk02, disk03, disk04, and disk05.

  Example:

```
% aumicro  -unit df500a1  -read  -path  disk01  disk02  disk03  disk04  disk05
Password:
Read disk : disk01 disk02 disk03 disk04 disk05
%
```

  This example checks the revision of the read-in microprogram.

  Example:

```
% aumicro  -revision
Password:
New Revision : 0501
%
```

  This example downloads the read-in microprogram into array unit df500a1. It sets the time interval to 3 seconds, and specifies the checking of the microprogram 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.

  Example:

```
% aumicro  -unit df500a1  -upload  -time 3  -check on
Password:
df500a1 : mmm/nnn done.
%
```

  This example replaces the current microprogram with the downloaded microprogram. Replacing takes place in the order of controller 0 and then controller 1.

  Example:

```
% aumicro  -unit df500a1  -change  -ctl0
The controller being replaced will stop accepting the access from the host.
Are you sure you want to replace the microprogram for controller 0?
Password:
%
% aumicro  -unit df500a1  -change  -ctl1
The controller being replaced will stop accepting the access from the host.
Are you sure you want to replace the microprogram for controller 1?
Password:
%
```

When downloading and replacing the microprogram has completed, the read-in microprogram in the Manager will be removed.

Example:

```
% aumicro  -clean
Password:
%
```

3.10 SNMP Environment Information

3.10.1 Setting SNMP Environment Information and Outputting Its File

- Command name

  ausnmp

- Format

  ```
  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

Options	Description
-unit unit_name	Specifies the name of an array unit for which to read and set up an SNMP environment file. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
-get	Reads 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.
-config config.txt	Specifies the file name of SNMP configuration information.
-name name.txt	Specifies the file name of SNMP name information.

- Examples:

  The following example obtains the `config.txt` information and `the name.txt` information from array unit df500a1.

  Example:

```
% ausnmp  -unit df500a1  -refer  -config config.txt  -name name.txt
%
```

  The following example sets the `config.txt` and the `name.txt` information individually for array unit df400a1, which does not support the restart.

  Example:

```
% ausnmp  -unit df400a1  -set  -config config.txt  -name name.txt
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
SNMP Configuration modification completed successfully.
Please reboot Array for changes to take effect.
%
```

  The following example sets up the `config.txt` information and the `name.txt` information in array unit df500a1.

  Example:

```
% ausnmp  -unit df500a1  -set  -config config.txt  -name name.txt
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
SNMP Configuration modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

3.11 Displaying Statistical Information

3.11.1 Displaying Statistical Information

- Command name

  ```
  austatistics
  ```

- Format

  ```
  austatistics  -unit unit_name  -memory | -drive
  ```

- Description

  This command displays the statistical information that has been accumulated in the array unit. The following items will be displayed:

  - Controller use condition
  - Number of host commands received
  - Command execution condition
  - Cache load condition

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit for which to display statistical information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-memory | -drive`	Specifies the location of the statistical information to be displayed. **-memory:** The statistical information (the current information) in the current memory is displayed. **-drive:** The statistical information stored in the system drive (the information at the time of activation of the array unit) is displayed.

- Example:

  The following example displays the statistical information of array unit df500a1.

  Example:

```
% austatistics  -unit df500a1  -memory
Controller
  Array Time
  Controller Acting Time (Integrated) [minute(s)] :      4676
  Controller Acting Time (Work)       [m second]  : 256969390

  CTL0
    Power On Times    :        22      22
    H-SCSI Reset Time :      4676    4676
  CTL1
    Power On Times    :        22      22
    H-SCSI Reset Time :       676     676
Host Commands
CTL  LU  READ  WRITE
0    0   2677  3261
0    1   2752  2835
0    2   2506  2860
0    3   2614  2829
0    4   0     0
:    :   :     :
0    61  0     0
0    62  0     0
0    63  0     0
1    0   0     0
1    1   0     0
1    2   0     0
1    3   0     0
1    4   0     0
:    :   :     :
1    61  0     0
1    62  0     0
1    63  0     0

Execution
         Read        Write       Sequential  Sequential  Prefetch  Write Through
Reassigned
CTL  LU  Cache Hits  Cache Hits  Reads       Writes      Stagings  Operation
Blocks
0    0   1067        2904        384         424         31229     0             0
0    1   969         2651        387         386         30291     0             0
0    2   937         2664        374         371         26475     0             0
0    3   846         2629        360         368         24916     0             0
0    4   0           0           0           0           0         0             0
:    :   :           :           :           :           :         :             :

Cache Load
  Number of Inflow Threshold Reached
  CTL 0 :            0
  CTL 1 :            0
%
```

3.12 Obtaining Performance Information

3.12.1 Outputting Performance Information File

- Command name

  ```
  auperform
  ```

- Format

  ```
  auperform  -unit unit_name  -manual

  auperform  -unit unit_name  -auto  time  [ -count nn ]
  ```

- Description

  This command acquires the command operational condition of each LU in an array unit, and outputs their respective information in a text-file format into the current 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 six items will be acquired:

  - Number of Read commands received
  - Number of the cache-hitting ones of Read commands received
  - Rate of cache-hitting within the received Read command
  - Number of Write commands received
  - Number Write commands that had been cache-hit within the received Write command
  - Rate of cache-hitting within the received Write command

  The output file names are as follows:

  For acquiring manually: "pfms??.txt" for a single configuration, and "pfmd??.txt" for a dual configuration ("??" is a number from 00 to 99).

  For acquiring automatically: "pfmsXX.txt" for a single configuration, and "pfmdXX.txt" for a dual configuration ("XX" is a number from 00 to 98).

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to acquire performance information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
-manual	Acquires performance information manually.
-auto time	Automatically acquires performance information at an interval of time (1 to 1439 minutes) specified for this option.
-count nn	If automatic acquisition is specified, specify the number of times acquisition is repeated (1 to 99).

- Example:

  The following example acquires the performance information of array unit df500a1 only once at an interval of 10 minutes.

  Example:

```
% auperform  -unit df500a1  -auto 10
Day yy mm hh:mm:ss yyyy: count = n
%
```

3.13 Monitoring Errors

3.13.1 Setting Up E-Mail Reports

- Command name

  ```
  aumail
  ```

- Format

  ```
  aumail  -refer

  aumail  -set  [ -domain domain_name ]  [ -srv mail_server_addr ]
          [ -from from_addr ]  [ -add to_addr ]  [ -rm to_addr ]

  aumail  -test
  ```

- Description

  This command sets the E-Mail information that is transmitted when an error is detected while monitoring errors.

- Options

Options	Description
`-refer`	Displays the E-Mail information set currently.
`-set`	Sets E-Mail information. Specify one or more options among “-domain”, “-srv”, “-from”, “-add” and “-rm”.
`-domain domain_name`	Specifies the domain name. Specify the domain name in less than or equal to 39 alphanumeric characters or codes.
`-srv mail_server_addr`	Specifies the IP address or host name of a mail server. Specify the host name in less than or equal to 99 alphanumeric characters.
`-from from_addr`	Specifies the mail address of an E-Mail sender. Specify it the mail address in less than or equal to 99 alphanumeric characters or codes.
`-add to_addr`	Adds the mail address of an E-Mail receiver. Specify the mail address in less than or equal to 99 alphanumeric characters or codes. Up to 20 addresses can be set as receivers.
`-rm to_addr`	Deletes the mail address of an E-Mail receiver.
`-test`	Performs a test of originating an E-Mail.

- Examples:

  The following example displays the contents of an E-Mail information setup.

  Example:

```
% aumail  -refer
Domain Name         : abc.hitachi.co.jp
Mail Server Address : server1.abc.hitachi.co.jp
From Address        : sender1@str.hitachi.co.jp
Send to Address     : receiver1@abc.hitachi.co.jp
%
```

  The following example sets the E-Mail information.

  Example:

```
% aumail  -set  -domain abc.hitachi.co.jp  -srv server1.abc.hitachi.co.jp
-from sender2@abc.hitachi.co.jp  -add receiver2@abc.hitachi.co.jp
%
```

  The following example adds a receiver address.

  Example:

```
% aumail  -set  -add receiver3@abc.hitachi.co.jp
%
```

If an error is detected on the array unit while error monitoring is executed, the following error information will be reported by E-Mail. Usually, the subject is appended before E-Mail is transmitted.

- E-Mail Title

  To determine the failure of the array unit from the E-mail title, the E-mail has a format of attaching the failure part on the title (subject). The title format is shown below. Table 3.4 shows a list of titles (subjects).

  `Resource Manager/Obstruction` ***(failed part)***

Table 3.4 List of E-Mail Subjects

No.	Subject	Meaning
1	Disk	A drive blockade occurred.
2	DC Power	A DC power supply failure occurred.
3	Battery	A battery voltage error occurred.
4	Fan	A fan failure occurred.
5	Controller	A controller blockade occurred. (This occurs only in the dual controller configuration.)
6	AC Power	An AC power supply error occurred.
7	Cache Memory	A cache failure occurred.
8	Cache Backup Circuit	A backup circuit failure occurred.
9	ENC	An enclosure error occurred.
10	Loop	A loop error occurred.
11	Path	Path blockage occurred.
12	Warning	The array unit entered the warning state.
13	Array connection	A failure occurred in the connection with the array unit. A power OFF or a failure occurred in the array unit.

- E-Mail Message Text

  The E-mail reports a failed section with a message text. The format of the message text is shown below. A list of message texts is shown in Table 3.5.

  ```
  Day, Mon.dd hh:mm:ss yyyy/DF name/message text
  ```

  Day: Day of the week **hh:mm:ss:** Hours, minutes, and seconds

  Mon: Month **yyyy:** Year

  dd: Date

Table 3.5 List of E-Mail Message Texts

No.	Message text	Meaning of message
1	ARRAY Drive Detached ARRAY Detached Drive Position Port No.X Row No.Y	A drive blockade occurred. (The blocked drive is indicated with a set of a Port No. and a Row No.)
2	ARRAY DC Power Supply Failure	A DC power supply failure occurred.
3	ARRAY Battery Alarm	A battery voltage error occurred.
4	ARRAY Fan Alarm	A fan failure occurred.
5	ARRAY CONTROLLER Detached	A controller blockade occurred. (This occurs only in the dual controller configuration.)
6	ARRAY AC Power Supply Failure	An AC power supply error occurs.
7	ARRAY Cache Memory Alarm	A cache failure occurred.
8	ARRAY Cache Backup Circuit Alarm	A backup circuit failure occurred.
9	ARRAY ENC Alarm	An enclosure error occurred.
10	ARRAY Loop Alarm	A loop error occurred.
11	ARRAY Path Alarm	A path blockage occurred.
12	ARRAY Warning	The array unit entered the warning state.
13	ARRAY Resource Manager Interface error occurred	A failure occurred in the connection with the array unit. A power OFF or a failure occurred in the array unit.

3.13.2 Setting Additional Information on E-Mail

- Command name

  ```
  auunitmsg
  ```

- Format

  ```
  auunitmsg  -unit unit_name  -refer
  auunitmsg  -unit unit_name  -set string
  auunitmsg  -unit unit_name  -rm
  auunitmsg  -unit unit_name  -test
  ```

- Description

  This command sets the additional information E-mail.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit for which to acquire performance information. Specify the name in less than or equal to 16 characters using alphanumeric characters, special symbols "- (minus)", or "_ (underline)".
`-refer`	Displays the E-Mail additional information set currently.
`-set string`	Sets the E-Mail additional information. Specify the information in less than or equal to 64 alphanumeric characters. If you want to enter NULL characters, enter "".
`-rm`	Deletes the E-Mail additional information.
`-test`	Performs a test of originating an E-Mail.

The information set on E-mail is added to the E-mail attribute and the format is as follows:

```
Day, Mon.dd hh:mm:ss yyyy/DF name/additional information/message text
```

3.13.3 Setting the Starting of Application

- Command name

  `auextprog`

- Format

  `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

Options	Description
`-refer`	Displays (references) the external program set up.
`-set command`	Sets up an external program that is started 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.

  Example:

```
% auextprog -set go
%
```

  The following example displays the application setup to be executed.

  Example:

```
% auextprog -refer
Application Name : go
%
```

3.13.4 Monitoring Errors

- Command name

  `auerroralert`

- Format

  `auerroralert [ -time uptime ] [ -mail ] [ -prog every | once ] [ -nodisp ]`

- Description

  This command monitors an array unit subject to monitoring (an array unit registered with auunitadd by specifying the `-watch` option) for errors. While monitoring errors, the word "Execution" indicating that monitoring is in execution, and 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 "Execution" indicating that monitoring is in execution is displayed repeatedly on a line, and the time for which monitoring is in execution is updated and displayed.

  To stop monitoring for errors, forcibly terminate the process (e.g., press the **Ctl** + **c** keys).

- Options

Options	Description
`-time uptime`	Specifies the time interval at which to monitor errors. Specifies a value from 1 to 720 (minutes). If omitted, the error is monitored only once.
`-mail`	Originates an E-Mail when an error is detected.
`-prog every | once`	Executes an external program when an error is detected. **every:** After error monitoring is started, a specified application is started when an error is detected. If the same error is detected while monitoring errors, the application is no longer started from the second detection onward. **once:** After error monitoring is started, a specified application is started when an error is detected for the first time. If errors are detected continuously, the application will not start. After the specified application executes the first time, in order to start the application again when an error is detected, terminate the error monitoring and then restart again.
`-nodisp`	A screen display of the monitoring result is suppressed.

- Examples:

  The following example monitors errors at an interval of 10 minutes. During error monitoring, a battery failure was detected in array unit df400a1.

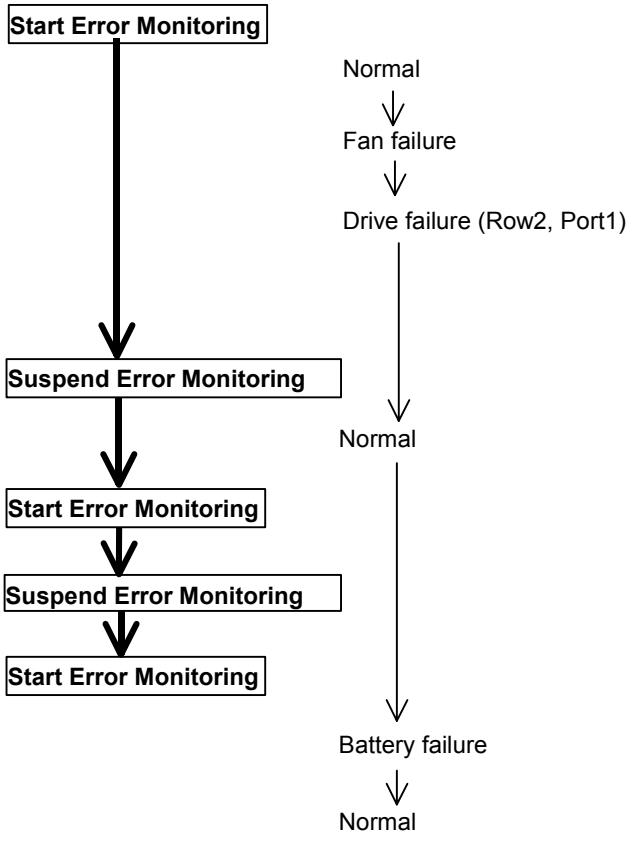
  Example:

```
% auerroralert  -time 1
Mon, May 01 10:10:00 2000 Executing.
Mon, May 01 10:30:00 2000/df400a1/ARRAY Battery Alarm.
Mon, May 01 10:40:00 2000 Executing.
```

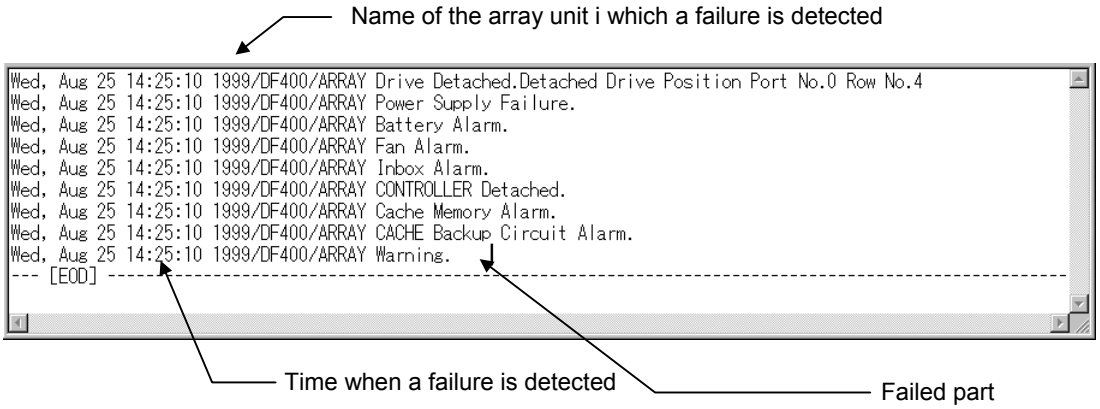
  When a failure is detected in the array unit and error monitoring is executed, the function outputs the failure information to a log file.

  The log file is output with file name: `errlog.txt` and in a text file format, onto a path setup by the DAMP_ROOT_DIR_PATH environmental variable. The file format is shown in the following example.

  Example:



Example:



The log file is output up to 223 kbyte or up to 2,000 events. When the log information exceeds the limit, the log information is overwritten from the top of the file and is output. "--- end ---" is output is at the end of the log information; therefore, search for "--- end ---" to determine the latest information.

Note: The failure detection time is a time of the clock on a personal computer or SUN server/workstation in which the Resource Manager 9200 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. A list of message texts is shown in Table 3.6.

```
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

Table 3.6 List of Message Texts to Be Output

No.	Message text	Meaning of message
1	Alert Started.	The error monitoring is started.
2	ARRAY Drive Detached. Detached Drive Position Port No.X Row No.Y	A drive blockade occurred. (The blocked drive is indicated with a set of a port No. and a row No.)
3	ARRAY DC Power Supply Failure	A DC power supply failure occurred.
4	ARRAY Battery Alarm	A battery voltage error occurred.
5	ARRAY Fan Alarm	A fan failure occurred.
6	ARRAY CONTROLLER Detached	A controller blockade occurred. (This occurs only in the dual controller configuration.)
7	ARRAY AC Power Supply Failure	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	An enclosure error occurred.
11	ARRAY Loop Alarm	A loop error occurred.
12	ARRAY Path Alarm	A path blockage occurred.
13	ARRAY Warning	The array unit entered the warning state.
14	ARRAY Resource Manager Interface error occurred	A failure occurred in the connection with the array unit. A power OFF and a failure occurred in the array unit.
15	ARRAY Resource Manager Interface error occurred. Error Code (nnnnn).	When the array unit was connected via an LAN, a connection disability occurred. **nnnnn:** Winsock error code
16	ARRAY Resource Manager Interface error occurred.	When the array unit was connected via RS232C, a connection disability occurred.
17	Errinf.Txt File Error (xxxx).	A failure occurred in an access to a work file. **xxxx:** OPEN: File open failure xxxx: File operation failure

Chapter 4 Resource Manager 9200 Operation Procedure

The following section describes basic operation procedures of Resource Manager 9200 after installation.

4.1 Executing Commands by Setting Administrator Mode

1. Setting a password

   When performing operations, such as setting up the configuration of an array unit on the Manager, as an administrator of the array unit, a password is required. Therefore, you must first set an administrator password. To set a password, use the `aupasswd` command. Once the password is set, it will be saved in the workstation, so the password does not need to be set every time you perform operation.

   Note: Changing a password at regular intervals is recommended. An `aupasswd` command is also used to change a password.

2. Registering an array unit

   Register the array unit that you want to operate in the Resource Manager 9200. Use the `auunitadd` command to register an array unit. When registering, give a unique unit name (up to 16 alphanumeric characters) to one array unit, and register information such as the unit type (9200), a configuration (Single, Dual), and a connection interface (LAN, RS232C). The name of the array unit registered here will be used by each command of the Resource Manager 9200 as a key word to specify an array unit. Once the information of the array unit is registered, it will be kept under control of the Resource Manager 9200, so the array unit information does not need to be registered at every operation.

   Additionally, use the `auunitchg` command to change the registered contents. When the registered information no longer needs to be controlled by the Resource Manager 9200, use the `auunitdel` command to delete the information.

3. Operations with various commands

   After an array unit is placed under control of the Resource Manager 9200 by registering the unit, perform operations on the array unit such as referencing, setting, and monitoring by use of various Resource Manager 9200 commands.

4.2 Executing Commands Using a User ID

1. Setting the user ID

   Register the user ID of a user who manages an array unit that has been registered in the Resource Manager 9200. Use an `auuidadd` command to set up a user ID.

   Note: Once a user ID is registered, commands cannot be executed on the relevant array units without entering the user ID (login: aulogin).

2. Logging into array unit

   Log into an array unit with a registered user ID. Use the `aulogin` command. When forcibly logging into an array unit to which another user has already logged in, use an `aulogin` command with the -discon option appended.

3. Operations with various commands

   After an array unit is placed under control of the Resource Manager 9200 by registering the array unit, perform operations on the array unit such as referencing, setting, and monitoring by use of various Resource Manager 9200 commands. When executing commands after logged in, you are not prompted to enter the user ID used for logging in and the password.

4. Logging out from array unit

   Log out from an array unit to which you have logged in. Use the `aulogout` command.

Chapter 5 Examples of Using Commands

The following shows an example of setting up one logical unit after connecting one RAID group to an array unit.

Example:

```
% aupasswd              Register a password.
New password :          Enter the password.
Retype new password :           Enter the password again.
%
% auunitadd  -unit array01  -DF400  -dual  -LAN  -ctl0 125.0.9.98  -ctl1 125.0.9.99
         Registers a DF400 array unit with a dual configuration by unit name array01.
         The connection interface is a LAN connection for both units.
% auunitref             Check whether the registration has completed.
Array Unit Name  Group Name  Array Unit Type  Error Alert  Connection Mode  IP
Address/Host
Name/Device Name
df350a                       DF400 Dual       on           LAN
192.168.33.120
192.168.33.130
%
% aurgadd  -unit array01  -rg 0  -RAID5  -row 0  -port 0  -width 5  -depth 1
         Adds a RAID group with a RAID5 level.
Password:               Enter an already-registered password.
%
% auluadd  -unit array01        Check whether the RAID group has been configured.
RG  Level  Port  Width  Row  Depth
0   5      0     5      0    1
%
% auliadd  -unit array01  -lu 0  -rg 0  -size 100352  -ctl0    Adds LU0.
Password:               Enter an already-registered password.
%
% auluref  -unit array01        Check whether the LU has been configured.
LU  Capacity  Status   Staging  C-CTL  D-CTL  RG  RAID
0   100352    Unformat 512      0      0      0   5
```