

Areas Covered

Before Reading This Manual

This section explains the notes for your safety and conventions used in this manual.

Chapter 1 Overview

This chapter introduces the main features of a disk array configured with the array controller and provides precautions.

Chapter 2 Array Configuration [SATA Setup Utility]

This chapter explains array configurations using this array controller.

Chapter 3 Preparations

This chapter explains how to update the device drivers.

Chapter 4 Array Management [ServerView RAID]

This chapter contains an overview of and product requirements for ServerView RAID Manager, and describes how to install and use the program.

Chapter 5 Replacing Hard Disk

This chapter explains maintenance related issues, such as hard disk replacement.

Appendix

This section explains ServerView RAID event log and how to set e-mail notifications for hard disk failures.

Before Reading This Manual

This manual is a guide for using a software RAID controller, "Embedded MegaRAID SATA".

Remarks

■ Symbols

Symbols used in this manual have the following meanings:

	These sections explain prohibited actions and points to note when using this software. Make sure to read these sections.
	These sections explain information needed to operate the hardware and software properly. Make sure to read these sections.
	This mark indicates reference pages or manuals.

■ Key descriptions/operations

Keys are represented throughout this manual in the following manner:

E.g.: [Ctrl] key, [Enter] key, [→] key, etc.

The following indicate the pressing of several keys at once:

E.g.: [Ctrl] + [F3] key, [Shift] + [↑] key, etc.

■ CD/DVD drive descriptions

In this manual, both CD-ROM and DVD-ROM drives are described as a CD/DVD drive.

Select a proper drive depending on your environment.

■ Entering commands (keys)

Command entries are written in the following way:

```
diskcopy a: a:
           ↑ ↑
```

- In the spaces indicated with the "↑" mark, press the [Space] key once.
- In the example above, the command entry is written in lower case, but upper case is also allowed.
- CD/DVD drive letters are shown as [CD/DVD drive]. Enter your drive letter depending on your environment.

```
[CD/DVD drive]:\setup.exe
```

■ Screenshots and figures

Screenshots and figures are used as visual aids throughout this manual. Windows, screens, and file names may vary depending on the OS, software, or configuration of the server used. Figures in this manual may not show cables that are actually connected for convenience of explanation.

■ Consecutive operations

Consecutive operations are described by connecting them with a dash (–).

Example: For the operation to click the [Start] button, point to [Programs], and click [Accessories]

↓

Click the [Start] button – [Programs] – [Accessories].

■ Abbreviations

The following expressions and abbreviations are used throughout this manual.

table: Abbreviation of product name

Product name	Expression and abbreviation	
Embedded MegaRAID SATA	the array controller, this array controller	
Microsoft® Windows Server® 2003, Standard Edition Microsoft® Windows Server® 2003 R2, Standard Edition	Windows Server 2003	Windows
Microsoft® Windows® Small Business 2003 Microsoft® Windows® Small Business 2003 R2		
Microsoft® Windows Server® 2003, Standard x64 Edition Microsoft® Windows Server® 2003 R2, Standard x64 Edition	Windows Server 2003 x64 [Note 1]	
Microsoft® Windows® 2000 Server Microsoft® Windows® 2000 Advanced Server	Windows 2000 Server	
Microsoft® Windows® 2000 Professional	Windows 2000 Professional	
Microsoft® Windows® XP Professional	Windows XP	
Windows Vista® Business Windows Vista® Enterprise Windows Vista® Ultimate	Windows Vista	
Red Hat Enterprise Linux ES (v.4 for x86)	RHEL-ES4(x86)	Linux
Red Hat Enterprise Linux ES (v.4 for EM64T)	RHEL-ES4(EM64T)	
Red Hat Enterprise Linux AS (v.4 for x86)	RHEL-AS4(x86)	
Red Hat Enterprise Linux AS (v.4 for EM64T)	RHEL-AS4(EM64T)	
Red Hat Enterprise Linux 5 (for x86)	RHEL5(x86)	
Red Hat Enterprise Linux 5 (for Intel64)	RHEL5(Intel64)	

[Note 1]: Unless otherwise noted, Windows Server 2003 can also mean Windows Server 2003 x64.

Reference Information

■ Information for PRIMERGY

For the latest information on PRIMERGY, update modules, drivers and the software, refer to the Fujitsu PRIMERGY website.

<http://www.fujitsu.com/global/services/computing/server/ia/driver/>

Regarding BIOS and FW, contact to Fujitsu Support Office.

Refer to the website (http://www.fujitsu.com/global/contact/computing/PRMGRY_index.html).

■ PRIMERGY Startup Disc

The "PRIMERGY Startup Disc" referred in this manual is supplied with a PRIMERGY server.

Depending on your PRIMERGY type, "PRIMERGY Document & Tool CD" may be supplied instead.

Then "PRIMERGY Startup Disc" also means "PRIMERGY Document & Tool CD" in this manual.

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Chapter 1

Overview

1

This chapter provides an overview and configuration precautions for the disk array, and an explanation of the array configuration flow.

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1.1 Array Controller Work Flow

The work flow when using a disk array controller is as follows:

■ For Windows

1 . Designing Disk Arrays

- ▼ Set the operation pattern of a disk array configuration. Design a RAID level and a logical drive configuration.
 - 1.2 Overview of Disk Array Configuration
 - 1.3 Disk Array Configuration Features

2 . Installing Hardware

- ▼ Install hard disks on the hard disk unit bay.
 - 1.4 Notes before Operation
 - "User's Guide" supplied with the server

3 . Configuring Disk Arrays

- ▼ Configure disk arrays using SATA Setup Utility before the OS installation.
 - Chapter 2 Array Configuration [SATA Setup Utility]

4 . Installing the OS

- ▼ → "User's Guide" supplied with the server

5 . Installing Management Tools

- ▼ Install the following management tools.
 - ServerView RAID
 - HDD Check Scheduler
 - Chapter 4 Array Management [ServerView RAID]

POINT

 - HDD Check Scheduler is set to start every day at 12:00 by default.

ServerStart helps you complete the steps **3** to **5** .

6 . Updating Device Drivers

- ▼ Update device drivers to the latest version stored on the Array Controller Document & Tool CD.
 - 3.1 Updating Device Drivers

7 . Preparing Environment For Management Tools

- Register a user account to access management tools. (Not required if already acquired at the installation of management tools.)
 - 4.3.1 How to Install ServerView RAID
- Set time for HDD Check Scheduler to start.
 - 4.4.2 Modifying HDD Check Start Time

POINT

 - HDD Check Scheduler is set to start every day at 12:00 by default. Change the schedule as needed.

■ For Linux

For using Linux, see the PRIMERGY page on the Fujitsu website (<http://primergy.fujitsu.com/>) and refer to information about Linux.

1. Designing Disk Arrays

- ▼ Set the operation pattern of disk array configuration. Design a RAID level and a logical drive configuration.
 - 1.2 Overview of Disk Array Configuration
 - 1.3 Disk Array Configuration Features

2. Installing Hardware

- ▼ Install hard disks on the hard disk unit bay.
 - 1.4 Notes before Operation
 - "User's Guide" supplied with the server

3. Configuring Disk Arrays

- ▼ Configure disk arrays using SATA Setup Utility before the OS installation.
 - Chapter 2 Array Configuration [SATA Setup Utility]

4. Installing the OS

- ▼
 - "Installation Guide"

5. Installing Management Tools

- ▼ Install the following management tools.
 - "Installation Guide"
 - ServerView RAID
 - HDD Check Scheduler
 - POINT**
 - HDD Check Scheduler is set to start every day at 12:00 by default.

6. Preparing Environment For Management Tools

- Register a user account to access management tools. (Not required if already acquired at the installation of management tools)
 - "Installation Guide"
- Set time for HDD Check Scheduler to start.
 - POINT**
 - HDD Check Scheduler is set to start every day at 12:00 by default. Change the schedule as needed.

1.2 Overview of Disk Array Configuration

This section contains an overview (RAID levels and logical drives) and a functional description of the disk array.

1.2.1 Array Controller Specifications

Specifications of the array controller described in this manual are as follows:

table: Specifications

Item	Contents
Product name	Embedded MegaRAID SATA
Where to be installed in the server	Onboard
Interface	SATA (Serial ATA)
The number of ports	Depending on the server
Cache memory	Not available
Cache memory battery	Not available
Supported OS	OS supported by server
Management Tools	<p>Available tools are: (1) SATA Setup Utility which configures disk arrays before installing the OS and (2) ServerView RAID which monitors or manages an array controller on the OS. Make sure to install the management tools before using the array controller.</p> <ul style="list-style-type: none"> • SATA Setup Utility BIOS utility in the array controller. →"Chapter 2 Array Configuration [SATA Setup Utility]" (→pg.23) • ServerView RAID →"Chapter 4 Array Management [ServerView RAID]" (→pg.55)

1.2.2 What is Disk Array?

A disk array or RAID (Redundant Array of Independent Disks) is a system that uses an array controller and multiple hard disks to achieve better performance and higher reliability than when using a single hard disk.

An array controller controls the access to each hard disk. There are different types of control methods that are defined as RAID levels.

By using a redundant RAID level, system operation can be continued without data loss in the event a hard disk unit fails.

1.2.3 RAID Levels

There are several types of RAID level, with different characteristics. The RAID levels supported by this array controller are 0 and 1. Depending on the RAID level, the number of installable hard disks, available capacity and applicability of redundancy are different.

table: Characteristics of each RAID level

RAID Level	Number of hard disks [Note 1]	Available total capacity	Redundancy
RAID 0	1 to 4	Capacity of one hard disk × number of hard disks	No
RAID 1	2	Capacity of one hard disk	Yes

[Note 1]: The number of hard disks indicates the specifications for the array controller. The actual installable number of hard disks depends on the specifications and configuration of the server.

POINT

- ▶ You should backup the data as frequently as possible just in case even when with redundancy.

■ Reliability and performance comparison between RAID levels

When choosing a RAID level, compare reliability and performance between RAID levels to determine the right level. The recommended RAID level is RAID 1. RAID 1 is superior to other RAID levels in data recoverability. RAID 1 can only be consisted of two hard disks and the available capacity is equal to the capacity of a single hard disk. If the logical drive capacity is insufficient, you can increase the capacity by configuring multiple RAID 1 logical drives.

table: Characteristics of each RAID level

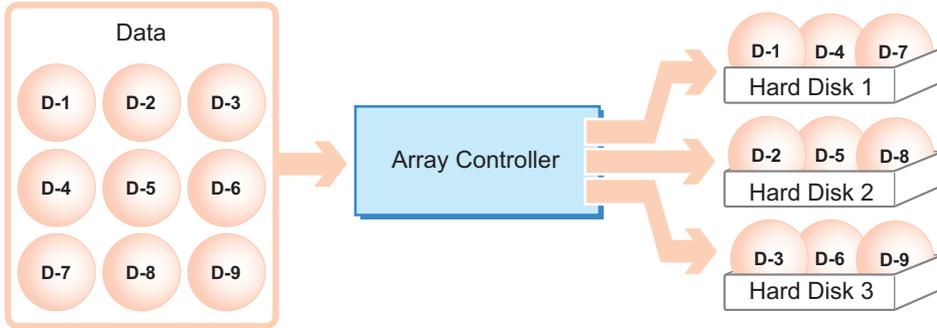
RAID Level	Data Reliability		Performance		Capacity	Remarks
	Redundancy [Note 1]	Recoverability [Note 2]	Write	Read		
RAID 0	×	×	○	○	◎	Not recommended because no data redundancy is provided.
RAID 1	○	△	○	○	△	Highly recommended for its excellent data recoverability.

[Note 1]: Data redundancy for the case when a single hard disk fails or gets disconnected.

[Note 2]: Data recoverability when two or more hard disks are disconnected due to a failure other than a hard disk failure. For RAID 1, in which data is not striped, other systems may read one of the consistent hard disks in the RAID 1 configuration. However, even for RAID 1, data cannot always be recovered.

■ RAID 0 (Striping)

Striping refers to the function of dividing data and writing them on multiple hard disks. For example, when writing nine blocks of data (D1 to D9), if three hard disks are involved, data is written evenly on each hard disk as shown in the figure below. Performance is improved by writing data on three different hard disks rather than writing all nine data blocks on a single hard disk.

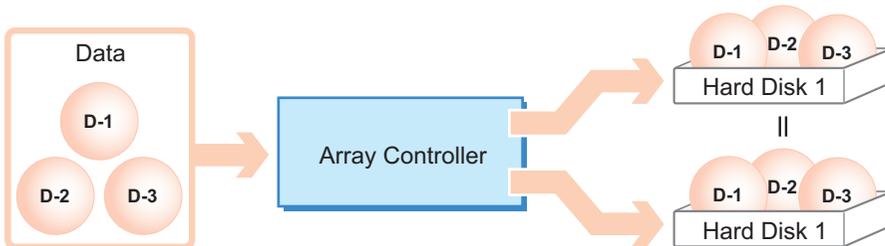


IMPORTANT

- ▶ RAID 0 has no redundancy and all data may be lost in the case of even one hard disk failure. System operation will also be interrupted.
- ▶ When replacing a hard disk as a preventive measure, you need to backup all the data on the logical drive and restore. For information about the preventive replacement of a hard disk, see "5.3.5 Preventive Replacement of Hard Disk (RAID 0) [SATA Setup Utility]" (→pg.124)

■ RAID 1 (Mirroring)

Mirroring is a function in which identical data is written in two hard disks in duplicate. When operating in RAID 1 disk array configuration, the system always writes the same data in two hard disks, using the redundancy feature. Operation continues even when one of the hard disks fails and loses redundancy (critical). RAID 1 always consists of two hard disks and the actual capacity you can use is the capacity of one hard disk.



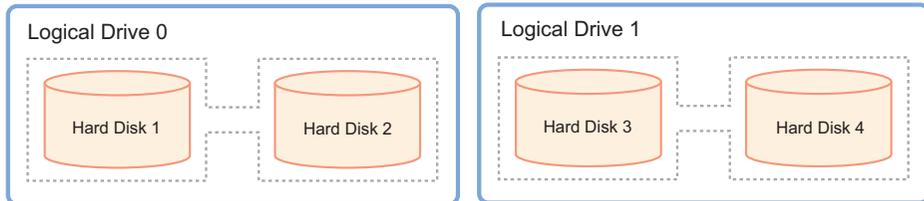
IMPORTANT

- ▶ With RAID 1, operation continues even if one of the hard disks fails (critical). However, data may be lost if both hard disks fail. If the status of a logical drive becomes critical, replace the failed hard disk as soon as possible and recover the redundancy. See "Chapter 5 Replacing Hard Disk" (→pg.107) for how to replace a hard disk.

1.2.4 Logical Drive

A logical drive is a logical hard disk space created when a disk array is configured. The OS recognizes it as same as a single hard disk.

As shown in the following figure, with RAID 1, two hard disks compose one logical drive, but the OS recognizes it as if a single hard disk was connected.



IMPORTANT

- ▶ Hard disks in a logical drive should be of the same model (with the same capacity and speed).

■ Status during hard disk failure

If one of the hard disks fails, the logical drive loses its redundancy, and the status becomes critical. If the other drive also fails, the logical drive status becomes offline (unavailable).

1.2.5 Checking Hard Disk Status

Hard disks and logical drives should be regularly monitored, and be replaced if there is a failure or failure prediction.

POINT

- ▶ The status differs depending on each management tool. For information about the status, see the appropriate description in your management tool's documents.
 - SATA Setup Utility
 - "2.1.5 Objects" (pg.27)
 - ServerView RAID
 - "4.6.3 Layout of Tree View" (pg.81)
- ▶ When ServerView RAID operates properly, information is logged as an event if an error occurs in the logical drive or hard disk.
 - "4.2 System Configuration and Event Monitor" (pg.60)
 - "Appendix A List of ServerView RAID Event Logs" (pg.128)

■ Logical drive status

Logical drive statuses are shown in the table below.

table: Logical drive status

Status	Description
Online	Operating normally.
Critical	Operating without redundancy. One or more hard disks for RAID 1 logical drive have been failed. Replace the failed hard disks as soon as possible and rebuild to restore the "Online" status. For how to replace the hard disk and rebuild, see "5.3 How to Replace Hard Disk" (→pg.119)
Offline	Not operating. Two or more hard disks in a logical drive have been failed. The data in the logical drive has also been lost.

■ Hard disk status

Hard disk statuses are shown in the table below.

table: Hard disk status

Status	Description
Online	Operating normally. It is included in the disk array.
Available	Operating normally. It is unused because it is not included in the disk array.
Failed	Unable to read/write data. The hard disk has been failed. Replace and perform rebuild. For how to replace a hard disk, see "5.3 How to Replace Hard Disk" (→pg.119).
Offline	Data read/write is disabled by the array controller. You need to rebuild the hard disk for the further usage.
Rebuild	The hard disk is currently being rebuilt.
Failure Predicted	Currently operating normally. But it may fail in the near future (failure predicted status). See "5.3 How to Replace Hard Disk" (→pg.119) and replace the hard disk as soon as possible.



- ▶ If there is a hard disk with failure status, there may be a hard disk failure and the hard disk may be operating without redundancy. The hard disk must be replaced as soon as possible. For how to replace a hard disk, see "5.3 How to Replace Hard Disk" (→pg.119).

1.3 Disk Array Configuration Features

This section explains the features in disk array configuration.

1.3.1 Logical Drive Initialization

After creating a logical drive, it must be initialized in order to use it properly. There are two methods to initialize a logical drive as described below.

■ Full initialization

With this method, "0 (zero)" is written in an entire logical drive to maintain consistency between the hard disks and to initialize them. This requires a certain amount of time because write operations are performed for the entire space of the hard disks.

POINT

- ▶ Full initialization is performed from SATA Setup Utility. For more information, see "2.4 Rebuilding Logical Drive" (→pg.43)
- ▶ If the server restarts during full initialization, the initialization is stopped and not completed. You need to initialize it again. The initialization will be resumed from where it was stopped.

● Time required for full initialization

The following table shows the estimated initialization time per 10GB of logical drive space.

table: Estimated time for full initialization per 10GB

RAID Level	Number of hard disks	Execution time per 10GB
RAID 1	2	approx. 30 min / 10GB

For example, the capacity of a RAID 1 logical drive consisting of two 80GB hard disks is 80GB, which requires approximately 240 minutes (= approx. 3 min./1GB × 80GB) to initialize. However, the time may differ from the value in the table above depending on the configuration and the hard disk type.

■ Fast initialization

With this method, "0 (zero)" is written to only the first and last 8MB of a logical drive.

If partition information remains in the first section of the logical drive, perform fast initialization to delete the partition information.

Fast initialization can be done with SATA Setup Utility. See "2.5 Initializing Logical Drive and Hard Disk" (→pg.47) for the procedure.

POINT

- ▶ This fast initialization completes in several tens of seconds to a few minutes.

1.3.2 Rebuild

Even if a single hard disk fails in a logical drive with redundancy, such as RAID 1, the logical drive continues to operate in critical state. If, however, another hard disk in the same logical drive also fails, the status of the logical drive becomes offline (unavailable). Rebuild is the operation to recover a logical drive from critical to normal (online).

The rebuild process is performed in the background in parallel with normal I/O access. During rebuilding, if a logical drive becomes critical, the redundancy of the logical drive remains lost. Once the rebuild is completed, it is restored to online.

■ Estimated time for rebuild

The following table shows the estimated time per 10GB of logical drive space when there is no I/O from the server.

table: Estimated time for rebuild per 10GB

RAID Level	Number of hard disks	Execution time per 10GB
RAID 1	2	approx. 25 min./10GB

For example, the capacity of a RAID 1 logical drive consisting of two 500GB hard disk is 500GB, which requires approximately 1250 minutes (= approx. 2.5 min./10GB × 500GB), which is approx. 20 hours to rebuild. When a hard disk operates 8 hours per day, it takes about 2 and a half days to rebuild. However, the time may differ from the value in the table above depending on the configuration and the hard disk type.

POINT

- ▶ The execution time above is an estimate when the Rebuild Rate is 30 (the initial value).
- ▶ The rebuild process is performed in parallel with normal I/O access; therefore I/O performance for the logical drives can be decreased during rebuild. With this array controller and the default settings, the I/O performance decreases about 50% at maximum.
- ▶ If the server restarts or shuts down during rebuild, the rebuild is resumed from where it was stopped the next time.

IMPORTANT

- ▶ At the initial settings, if the server restarts or shuts down during rebuild, the array controller halts at POST waiting for key-in. (→"5.1 Displaying Failed Condition on POST Message" (pg.108)). When a message indicates a logical drive is being rebuilt appears, press any key.

1.3.3 Make Data Consistent

Make Data Consistent is a function to maintain consistency between data on redundant logical drives (RAID 1) and mirrored data.

IMPORTANT

- ▶ If the server is not shut down properly, the data consistency among hard disks may be lost. In such cases, use this function to make the data consistent.
Data sent to the server is never changed by performing Make Data Consistent because correction of mirrored data and parity data is performed as necessary.
- ▶ The Make Data Consistent function is also used to recover from hard disk media errors (different from inconsistency) because it reads the data on the hard disk.

POINT

- ▶ If the server restarts or shuts down during Make Data Consistent, the Make Data Consistent is resumed from where it was stopped the next time.

Estimated time for Make Data Consistent

The following table shows the estimated execution time per 10GB of logical drive space when there is no server I/O.

table: Estimated time for Make Data Consistent per 10GB

RAID Level	Number of hard disks	Execution time per 10GB
RAID 1	2	approx. 4 min. / 10GB

For example, the capacity of a RAID 1 logical drive consisting of two 80GB hard disks is 80GB, which requires approximately 32 minutes (= approx. 0.4 min./1GB × 80GB) for Make Data Consistent.

However, the time may differ from the value in the table above depending on the configuration and the hard disk type.

POINT

- ▶ The time above is an estimate when the Rebuild Rate is 30 (the initial value).

1.3.4 Hard Disk Failure Prediction Function (PFA / S.M.A.R.T.)

The PFA/S.M.A.R.T. function is a failure prediction function for the hard disks that determines the risk of a failure in advance and issues a warning when the risk is high.

Although a hard disk will still operate normally even when a failure is predicted, the hard disk may fail in the near future. Replace the hard disk as soon as possible. See "5.3 How to Replace Hard Disk" (→pg.119) for the replacement procedure. You can identify the hard disk which is predicted to fail with ServerView RAID Manager or event logs.

1.3.5 HDD Check Scheduler

HDD Check Scheduler is a program to detect or recover media errors on hard disks. HDD Check Scheduler performs media checks to all logical drive areas including drive areas that are not accessed in everyday operation by performing Make Data Consistent periodically.

■ Overview of HDD Check Scheduler

Media errors may occur accidentally on a hard disk, in particular if the disk is exposed to a severe shock during operation. In that case, since this kind of event is not a hard disk failure, the medium error will not be detected until reading the data in the erroneous sector. If the disk is configured in a RAID level with redundancy, this array controller's usual functions will recover the data using the data on other hard disks. However, if a medium error occurs in a file that is rarely accessed, the error will remain unrecovered, and if an additional hard disk should also fail, the data will be lost.

Use HDD Check Scheduler properly to perform media checks periodically.

IMPORTANT

- ▶ HDD Check Scheduler periodically executes Make Data Consistent using the standard OS task-scheduling function. When you install HDD Check Scheduler, Make Data Consistent is set to start at 12:00 every day by default.
- ▶ Make sure to install ServerView RAID first, and then install HDD Check Scheduler. Installing HDD Check Scheduler is required.
Using ServerStart enables you to install ServerView RAID and HDD Check Scheduler automatically. For how to install HDD Check Scheduler manually and set a schedule, see "4.4 Installing HDD Check Scheduler [Windows]" (→pg.68).
- ▶ HDD checks using HDD Check Scheduler can only be performed on logical drives with redundancy (RAID 1). The checks cannot be performed on RAID 0 logical drives or the logical drives in critical state.
- ▶ If the server restarts or shuts down during Make Data Consistent, the Make Data Consistent will resume from where it was stopped the next time.

1.3.6 Logical Drive Configuration Information and Event Notification

Logical drive configuration information contains the following: logical drive RAID levels, locations of hard disks composing logical drives, and current statuses of logical drives and hard disks.

With this array controller, logical drive configuration information is recorded in the dedicated area of each hard disk. It is not recorded on the server. When restarting a system after a hard disk failure, configuration information between each hard disk may become inconsistent depending on the failure condition, and the accurate information may not be read.

Therefore, it is required to monitor hard disk failures outside of the server using a monitoring terminal to record event logs or hard disk failure notifications via e-mail.

For configuration examples, see "4.2.1 Operations via Network" (→pg.60) or "4.2.2 Hard Disk Failure Notification via E-mail" (→pg.61).

For how to set e-mail notifications, see "Appendix B Setting E-mail Notification for Hard Disk Failure" (→pg.145).

1.4 Notes before Operation

Check the following before starting the operation.

1.4.1 Notes on Hard Disks to Be Used

The following notes apply to the hard disks to be used. Please check in advance.

- **Available hard disks**

All hard disks in a logical drive use the same model (with the same capacity and speed) as a rule. Check that the installed hard disks have the same capacity and speed. Also, make sure the hard disks are the SATA hard disks that are installable on the server.

- **Reusing hard disks**

Hard disks containing data may have partition information or array configuration information. Using such disks without taking the proper measures may cause unexpected problems. When using a previously used hard disk, erase the data by performing low level format on the system that was using the hard disk, before connecting the disk to this array controller. The same caution applies: when using hard disks used by this product on another system, or when reconfiguring involves changing RAID levels on the same system. See "2.5.2 Initializing Hard Disk" (→pg.48) and completely erase the information on the hard disk before using it on another system.

- **Removing hard disk**

When the server not supporting hot swap is running, do not remove any hard disks. Even when the server supporting hot swap is running, do not remove any hard disks except for the following situations:

- When replacing a failed hard disk
- When replacing a hard disk as a preventive measure

- **Notes on connecting device**

Do not connect any devices other than Fujitsu-specified hard disks to this array controller.

1.5 Notes on Operation

This section contains notes concerning system operation when using this array controller.

1.5.1 Messages at POST

Power On Self Test (POST) runs at the array controller initialization right after power is turned on. When POST detects an error in a hard disk or logical drive, a POST message appears and the array controller halts waiting for key-in. In this case, see "5.1 Displaying Failed Condition on POST Message" (→pg.108) and take the necessary measures.

1.5.2 When Server Is Not Shut Down Properly

If the server is turned off without performing a proper shutdown due to power interruption, the consistency of the logical drive may be lost. In such cases, perform Make Data Consistent. For more information, see "4.8.3 Make Data Consistent" (→pg.95).

Chapter 2

Array Configuration [SATA Setup Utility]

2

This chapter explains an array configuration using this array controller.

2.1	SATA Setup Utility	24
2.2	Configuring/Deleting Array	32
2.4	Rebuilding Logical Drive	43
2.5	Initializing Logical Drive and Hard Disk	47

2.1 SATA Setup Utility

This section explains how to start up and exit SATA Setup Utility. It also explains each item for settings.

2.1.1 Starting and Exiting SATA Setup Utility

For how to start up and exit SATA Setup Utility is as follows:

■ Starting up SATA Setup Utility

- 1 When the server is starting up and POST is running, the message "Press Ctrl-M or Enter to run LSI Software RAID Setup Utility." appears on the screen. While it is displayed, press the [Ctrl] + [M] keys or the [Enter] key.

```

LSI MegaRAID Software RAID BIOS Version A.01.07201620R
LSI SATA RAID Found at PCI Bus No:00 Dev No:1F
Device present at port 0   WDC WD800JD-55MSA1       75807MB
Device present at port 1   WDC WD800JD-55MSA1       75807MB
Device present at port 2   ST3160815AS              152115MB
Device present at port 3   ST3160815AS              152115MB
Device present at port 4   HL-DT-STDVD-ROM GD
Press Ctrl-M or Enter to run LSI Software RAID Setup Utility.

```

SATA Setup Utility starts up and Management Menu appears.

POINT

- ▶ You have approximately 5 seconds to press the [Ctrl] + [M] keys or the [Enter] key.

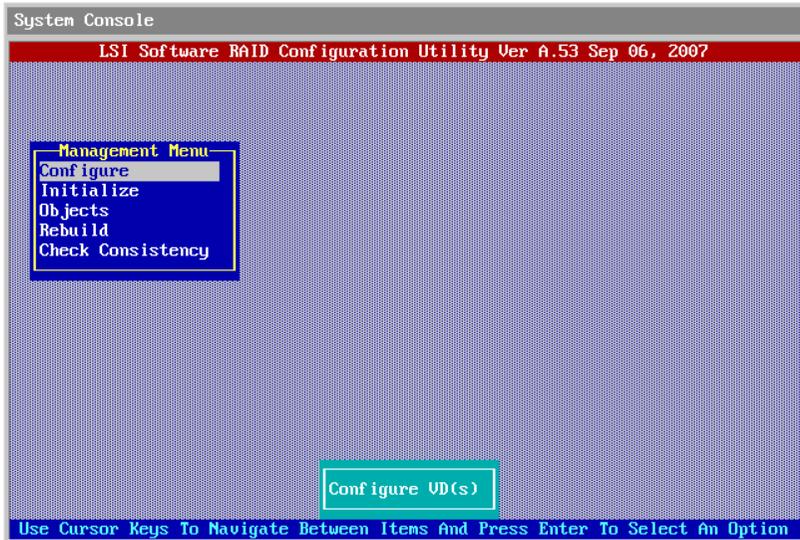
■ Exiting SATA Setup Utility

- 1 When a menu other than Management Menu is displayed, press the [Esc] key until the Management Menu appears.
- 2 When the Management Menu is displayed, press the [Esc] key. A message "Exit?" appears.
- 3 Select "Yes" and press the [Enter] key. Now you have exited SATA Setup Utility.

- 4 When the message "Press <CTRL><ALT> To Reboot The System" appears, turn off the server or press the [Ctrl] + [Alt] + [Delete] keys to restart the server.

2.1.2 Management Menu

Management Menu appears when starting up SATA Setup Utility.



Use the [↑] [↓] keys to point to the item to change the configuration, and press the [Enter] key to display the menu.

table: Management Menu

Item	Description
Configure	Creates, adds or deletes array configurations. →"2.1.3 Configuration Menu" (pg.26)
Initialize	Initializes logical drives. →"2.5.1 Initializing Logical Drive" (pg.47)
Objects	Displays or configures properties of the array controller, logical drives and hard disks. →"2.1.5 Objects" (pg.27)
Rebuild	Rebuilds logical drives. →"2.4 Rebuilding Logical Drive" (pg.43)
Check Consistency	Performs Make Data Consistent process for logical drives. →"2.2.3 Make Data Consistent on Logical Drive" (pg.38)

2.1.3 Configuration Menu

To display Configuration Menu, select [Configure] from Management Menu. You can view, create or add RAID configurations with this menu.

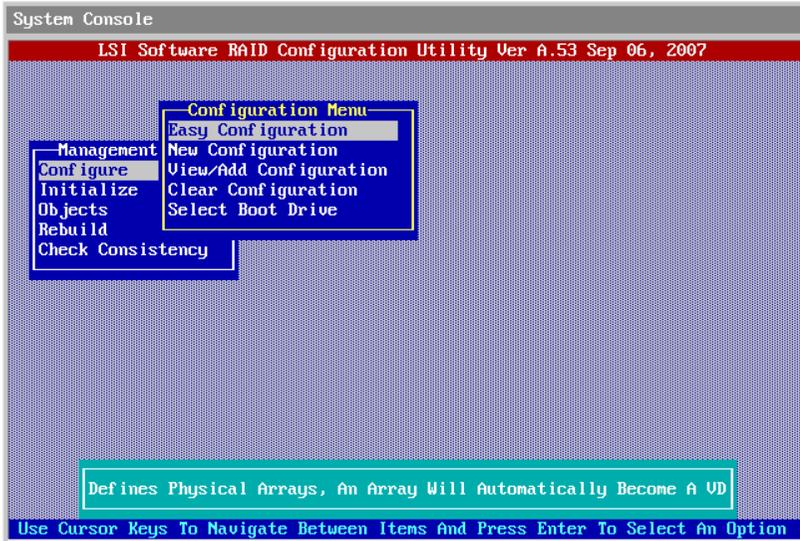


table: Configuration Menu

Item	Description
Easy Configuration	Not supported.
New Configuration	Deletes an existing configuration, and configures a new logical drive. →"2.2.1 Configuring New Logical Drive" (pg.32)
View/Add Configuration	Keeps an existing configuration, and configures an additional logical drive. →"2.2.2 Configuring Additional Array" (pg.35) Also displays / configures information of logical drives and hard disks. →"2.3 Displaying Logical Drive/Hard Disk Information" (pg.41)
Clear Configuration	Clears all existing arrays. →"2.2 Configuring/Deleting Array" (pg.32)
Select Boot Drive	Select a boot drive. Displays the [Bootable Virtual Drives] screen. Use the [↑] [↓] keys to select the logical drive to be booted, and press the [Enter] key.

2.1.4 Initialize

To initialize logical drives, see "2.5.1 Initializing Logical Drive" (→pg.47).

2.1.5 Objects

To display Objects, select [Objects] from Management Menu. You can view and configure properties of the array controller, logical drives or hard disks. To change the configuration, select the item to change using the [↑] [↓] keys, and press the [Enter] key.

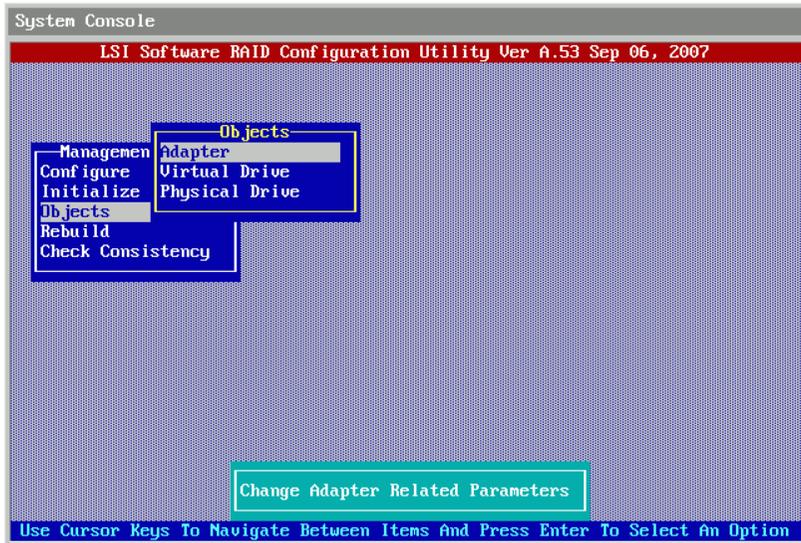


table: Objects

Item	Description
Adapter	Configures each item of a controller. → "■ Adapter" (pg.27)
Virtual Drive	Displays information, deletes, initializes and checks consistency of existing logical drives. → "■ Virtual Drive" (pg.29)
Physical Drive	Displays information of or operates physical drives. → "■ Physical Drive" (pg.30)

■ Adapter

You can configure each item of a selected controller. Make sure to operate at the initial value.

Select an item to configure using the [↑] [↓] keys, and press the [Enter] key.

To save the configuration, enter or select the configurations and press the [Enter] key.

IMPORTANT

- ▶ Configurations of a controller are recorded in a hard disk. Therefore, when you create a new logical drive, it is required to reconfigure it.

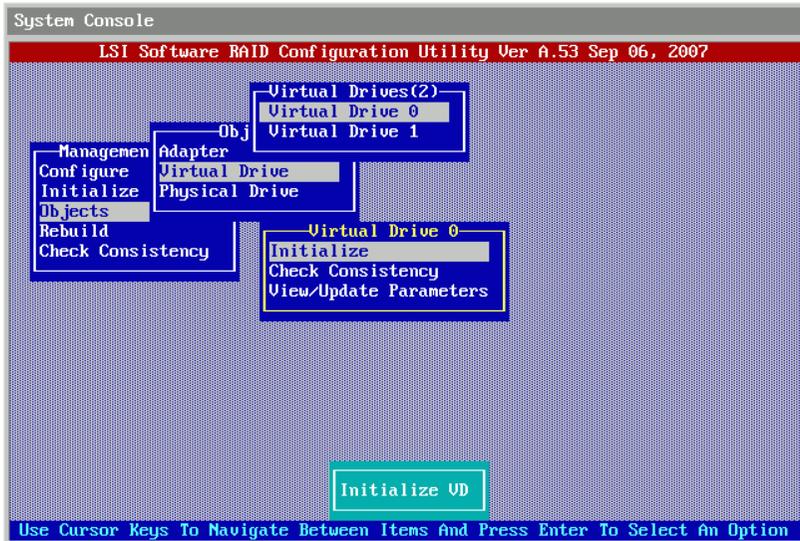


table: Adapter

Item	Default Value	Initial Value	Description
Rebuild Rate	30	30	Sets an I/O occupancy rate for rebuild.
Chk Const Rate	30	30	Sets an I/O occupancy rate for check consistency.
FGI Rate	30	30	Sets an I/O occupancy rate for full initialization.
BGI Rate	30	30	Not used for this array controller.
Disk WC	Off	Off	Enables/disables write cache.
Read Ahead	On	On	Enables/disables read-ahead cache.
Bios State	Enable	Enable	Enables/disables SATA RAID BIOS.
Cont On Error	Yes	No	Sets whether to stop or continue POST when an error, such as a hard disk unit failure, is detected on RAID BIOS.
Fast Init	Enable	Enable	Sets whether to perform fast initialization for logical drives. Note: ▶ Only this item can be changed as needed. → "2.5.1 Initializing Logical Drive" (pg.47)
Auto Rebuild	On	Off	Sets whether to perform automatic rebuild when replacing a hard disk unit.
Auto Resume	Enable	Enable	Sets from where to resume rebuild when the server shuts down/restarts during the rebuild; where it was stopped or the beginning.
DiskCoersion	1GB	1GB	Sets to round a hard disk unit when array is configured.

■ Virtual Drive

You can configure each item of a selected logical drive.



● Key operations

table: Virtual Drive key operation

Key	Description
[↑][↓]	Places a cursor over the logical drive.
[Enter]	Selects the logical drive to be set.
[Delete]	Deletes the selected logical drive.

● Operations of selected drive

table: Virtual Drive

Item	Description
Initialize	Displays a message, "Initialize?". To start initialization, select [Yes].
Check Consistency	Displays a message, "Consistency Check?". To start Make Data Consistent, select [Yes].
View/Update Parameters	Displays array configuration information.
RAID	Displays the RAID level of the logical drive.
Size	Displays the capacity of the logical drive.
Stripe Size	Displays the stripe size of the logical drive.
#Stripes	Displays the number of stripes of the logical drive.
State	Displays the state of the logical drive.
Spans	Displays the number of spans of the logical drive.
Disk WC	Displays and sets whether write cache is enabled/disabled. Note: ▶ This item always must be "Off".

table: Virtual Drive

Item	Description
Read Ahead	Displays and sets whether read-ahead cache is enabled/disabled. Note: ▶ This item always must be "On".

■ Physical Drive

You can view selected physical drive information and operate the physical drive.

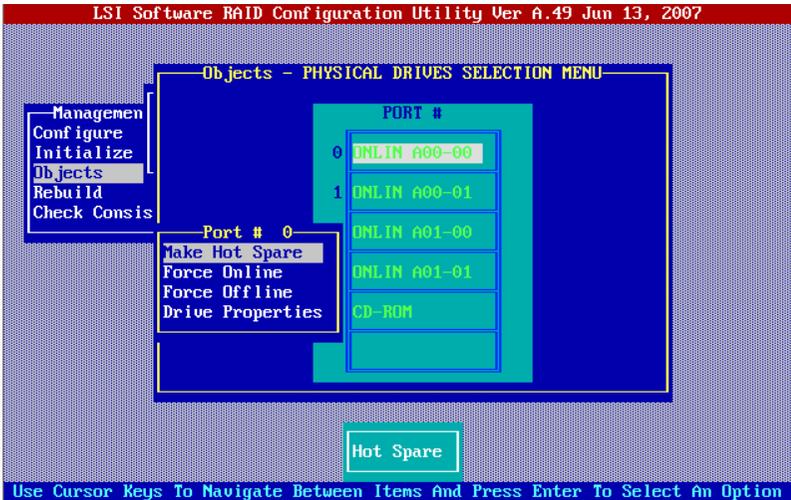


table: Physical Drive

Item	Description
Make Hot Spare	Not supported.
Force Online	Makes an offline disk to online. Note: ▶ Do not use this function unless you are instructed to do so, for example during maintenance. This operation may cause loss of data.
Force Offline	Makes an online disk to offline. Note: ▶ Do not use this function unless you are instructed to do so, for example during maintenance or when replacing a hard disk as a preventive measure. This operation may cause loss of data.
Drive Properties	Displays disk drive information.
Device Type	Displays the device type.
Capacity	Displays the disk capacity.
Product ID	Displays the product ID.
Revision No	Displays the firmware revision number.

2.1.6 Rebuild

You can rebuild critical (degraded) logical drives.

→"2.4 Rebuilding Logical Drive" (pg.43)

2.1.7 Check Consistency

You can make data consistent on logical drives.

→"2.2.3 Make Data Consistent on Logical Drive" (pg.38)

2.2 Configuring/Deleting Array

This section explains how to configure and delete arrays with this array controller.

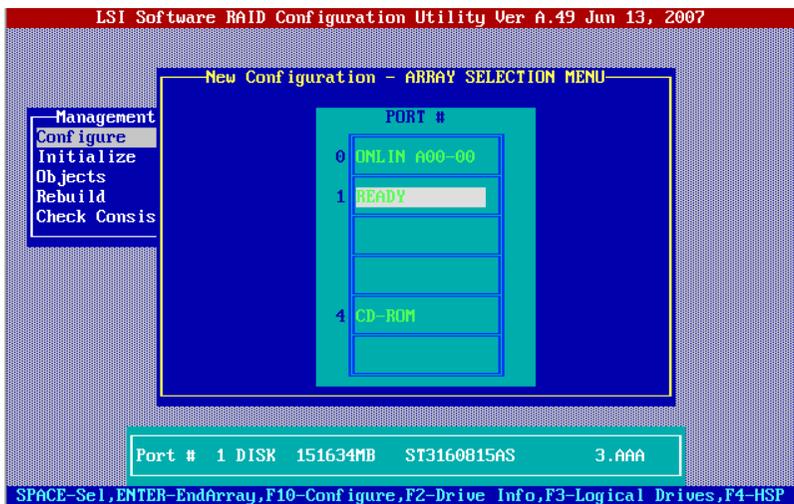
2.2.1 Configuring New Logical Drive

This section explains how to configure a new logical drive with this array controller.



- ▶ To use a previously used hard disk unit, initialize it on other systems before installing the hard disk. For more information, see the manual supplied with the system.

- 1** Start up SATA Setup Utility.
→"2.1.1 Starting and Exiting SATA Setup Utility" (pg.24)
- 2** Select [New Configuration] from Configuration Menu.
The message "Proceed?" appears.
- 3** Select [Yes].
The [New Configuration - ARRAY SELECTION MENU] screen appears.
- 4** Use the [↑] [↓] keys to place the cursor over the disk to configure an array, and press the [Space] key.



POINT

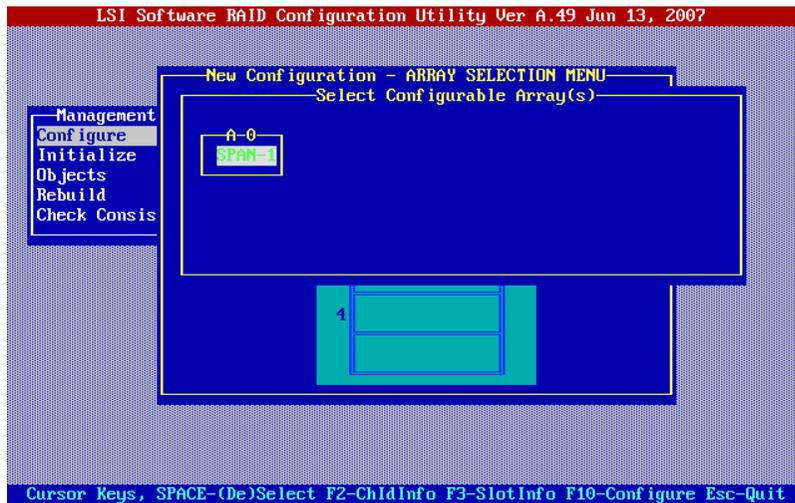
- ▶ To clear the selection, press the [Space] key again.
- To display the [Physical Drive Information] screen to see physical drive information, press the [F2] key.
- To display the [Virtual Drive(s) Configured] screen to see logical drive information, press the [F3] key.

5 Press the [F10] key.

The [Select Configurable Array] screen appears.

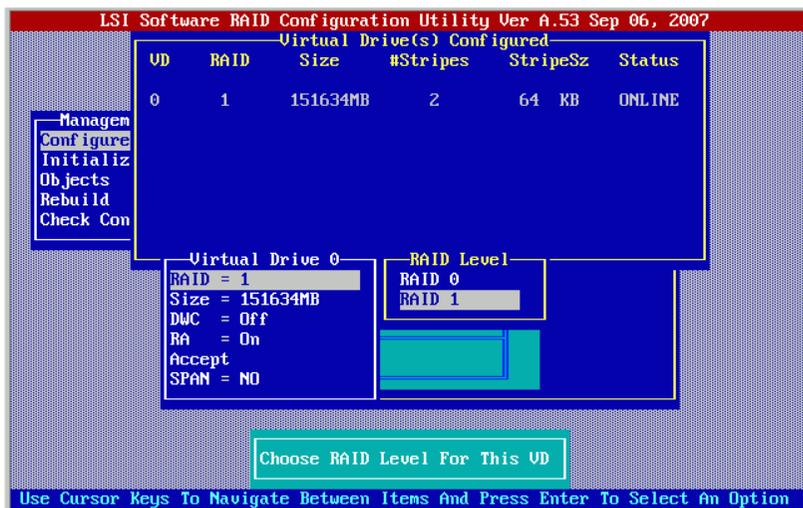
6 Press the [Space] key.

The selected array is marked "SPAN-1".



7 Press the [F10] key again.

The [Virtual Drive(s) Configured] and [Virtual Drive #] screens appear.



Not Changing RAID Level

Skip to step 8.

Changing RAID Level

1. Select [RAID = X], and press the [Enter] key.

The selectable RAID levels are displayed depending on the specified number of the hard disks.



- ▶ Do not change any other settings than RAID Level.

- 8 Select [Accept] and press the [Enter] key.

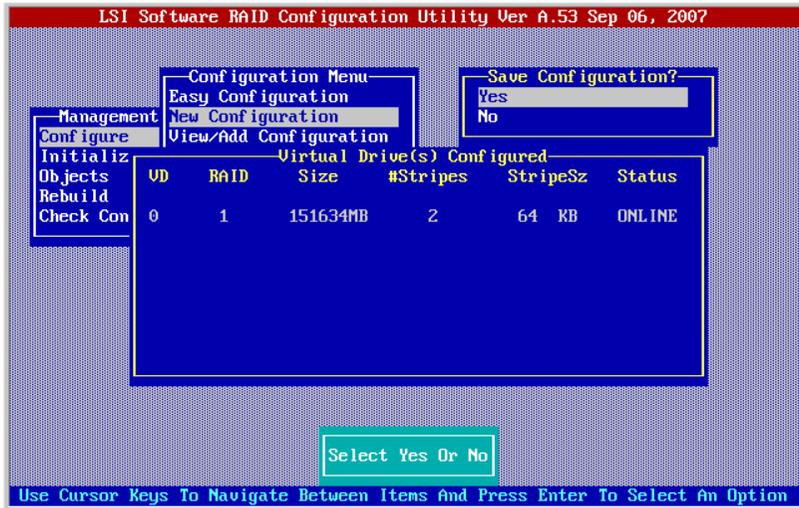
It takes you back to the [New Configuration - ARRAY SELECTION MENU] screen.

To complete the logical drive configuration, skip to step 9.

To continue configuring arrays of the hard disks indicating "READY", repeat steps from step 4 to 8.

- 9 Press the [Enter] key.

A message "Save Configuration?" appears.



- 10 Select [Yes].

The array configuration completes, and a message "Configuration Is Saved Press Any Key To Continue" is displayed at the bottom of the screen.



- ▶ When a logical drive is newly configured, select [Objects] (→pg.27) – [Adapter] (→pg.27) and set the initial value for this array controller.

- 11 Press the [Esc] key to exit the SATA Setup Utility.

→"2.1.1 Starting and Exiting SATA Setup Utility" (pg.24)

2.2.2 Configuring Additional Array

This section explains how to configure additional arrays with this array controller.

IMPORTANT

- ▶ When you use a previously used hard disk unit, initialize it on other systems before installing the hard disk. For more information, see the manual supplied with the system.

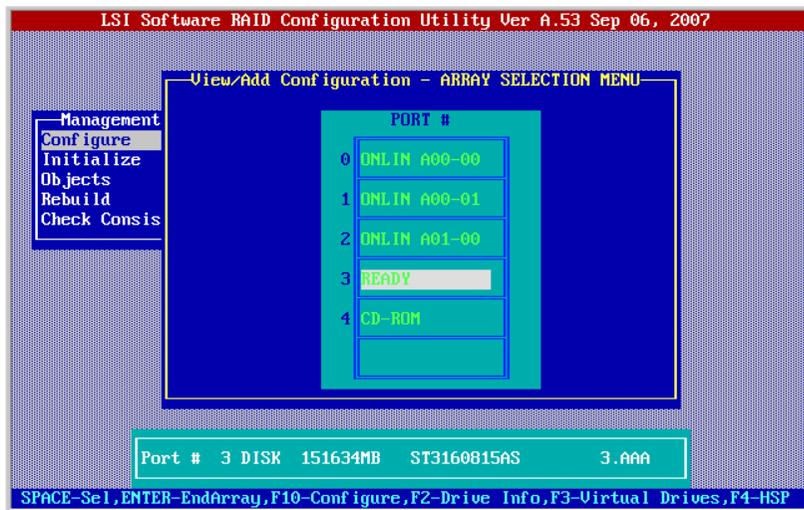
1 Start up SATA Setup Utility.

→"2.1.1 Starting and Exiting SATA Setup Utility" (pg.24)

2 Select [View/Add Configuration] from the Configuration Menu, and press the [Enter] key.

The [View/Add Configuration - ARRAY SELECTION MENU] screen appears.

3 Use the [↑] [↓] keys to place the cursor over the array configuration disk, and press the [Space] key.



POINT

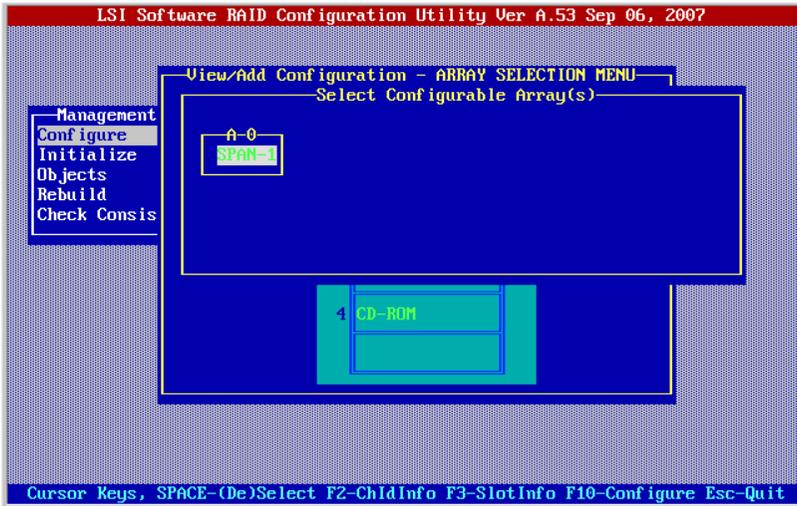
- ▶ To clear the selection, press the [Space] key again.
- To display the [Physical Drive Information] screen to see physical drive information, press the [F2] key.
- To display the [Virtual Drive(s) Configured] screen to see logical drive information, press the [F3] key.

4 Press the [F10] key.

The [Select Configurable Array] screen appears.

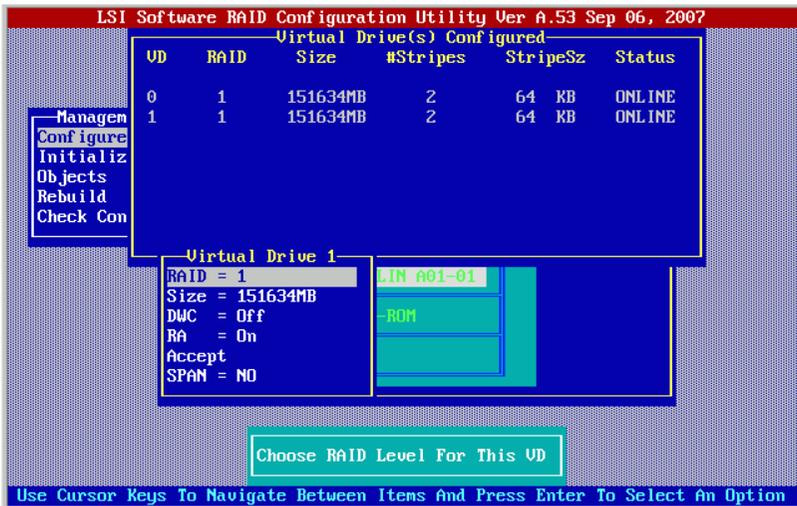
5 Press the [Space] key.

The selected array is displayed as "SPAN-1".



6 Press the [F10] key again.

The [Virtual Drive(s) Configured] and [Virtual Drive #] screens appear.



Not Changing RAID Level

Skip to step 8.

Changing RAID Level

1. Select [RAID = X], and press the [Enter] key.

The selectable RAID levels are displayed depending on the specified number of the hard disks.



- ▶ Do not change any other settings than RAID Level.

7 Select [Accept] and press the [Enter] key.

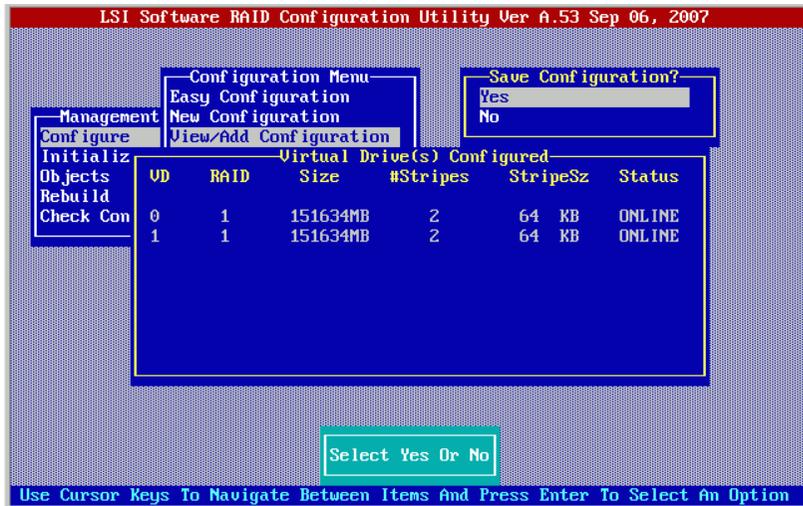
It takes you back to the [View/Add Configuration - ARRAY SELECTION MENU] screen.

To complete the logical drive configuration, skip to step 9.

To continue configuring arrays of the hard disks indicating "READY", repeat steps from step 4 to 8.

8 Press the [Enter] key.

A message "Save Configuration?" appears.



9 Select [Yes].

The array configuration completes, and a message, "Configuration Is Saved Press Any Key To Continue", is displayed at the bottom of the screen.

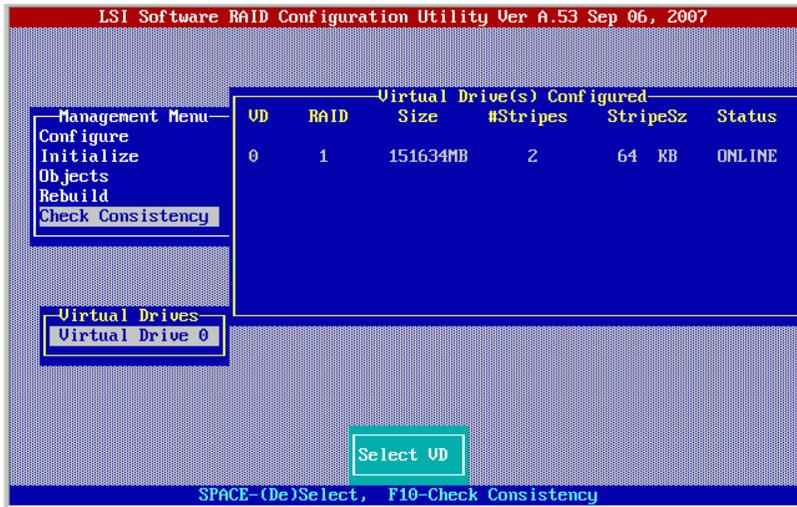
10 Press the [Esc] key to exit the SATA Setup Utility.

→ "2.1.1 Starting and Exiting SATA Setup Utility" (pg.24)

2.2.3 Make Data Consistent on Logical Drive

This section explains how to make data consistent on logical drives.

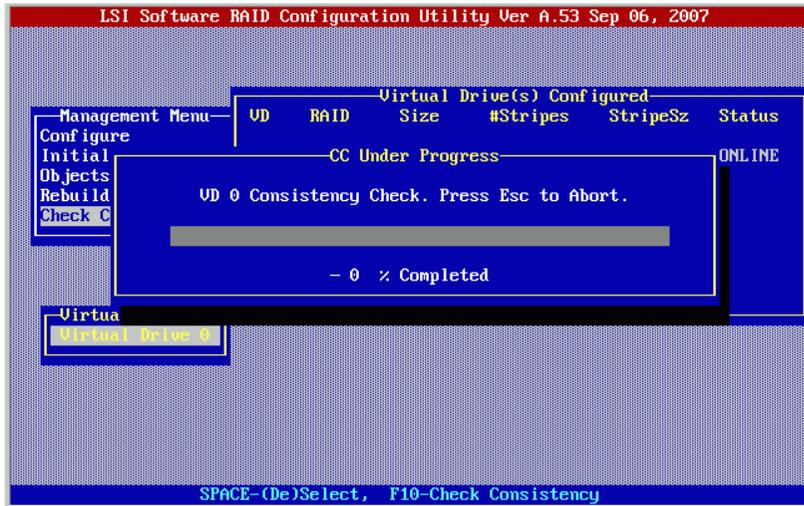
- 1** Start up SATA Setup Utility.
→"2.1.1 Starting and Exiting SATA Setup Utility" (pg.24)
- 2** Select [Check Consistency] from Management Menu, and press the [Enter] key.
The [Virtual Drive(s) Configured] and [Virtual Drives] screens appear.



- 3** Select the logical drive you want to perform Make Data Consistent, and press the [Space] key.
The selected logical drive is highlighted.
- 4** Press the [F10] key.
A message "Consistency Check?" appears.

5 Select [Yes], and press the [Enter] key.

Make Data Consistent starts and the progress bar appears.



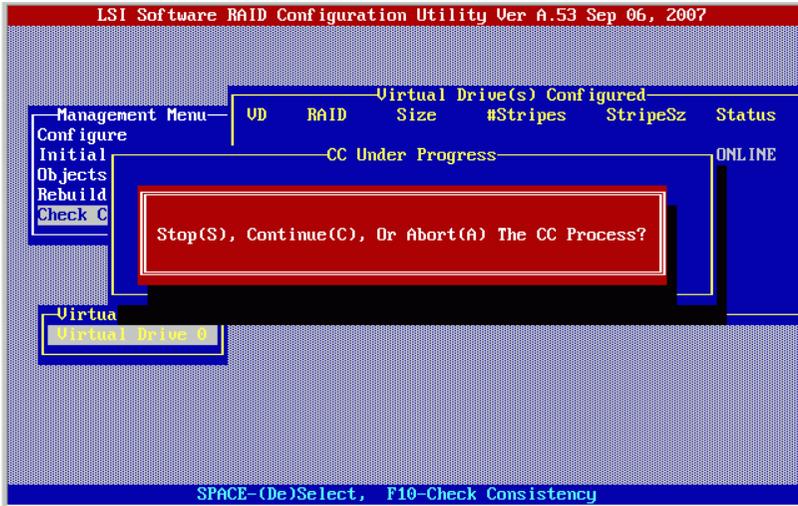
When Make Data Consistent is completed, "CC Completed Successfully. Press Esc.." is displayed.

6 Press the [Esc] key.

It takes you back to the Management Menu.

POINT

- ▶ To work on something else during Make Data Consistent, press the [Esc] key. The following menu appears.



On this menu, the following functions are available by pressing the [S], [C] or [A] key.

Stop (S)	Stops Make Data Consistent process. The process is resumed from where it was stopped the next time you perform Make Data Consistent or restart the system.
Continue (C)	Restarts Make Data Consistent process.
Abort (A)	Aborts Make Data Consistent process. The process is resumed from the beginning the next time.

2.2.4 Deleting Array Configuration

This section explains how to delete arrays with this array controller. Follow the procedure below to delete all set array configurations.

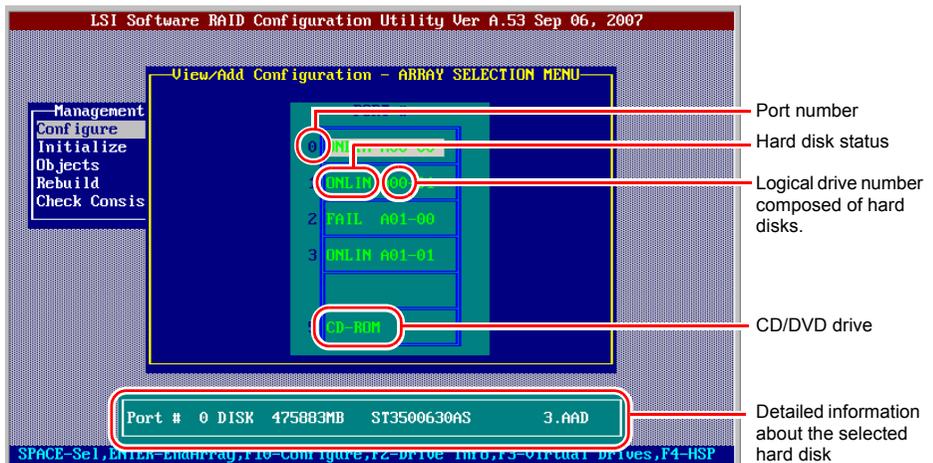
- 1** Start up SATA Setup Utility.
→"2.1.1 Starting and Exiting SATA Setup Utility" (pg.24)
- 2** Select [Clear Configuration] from the Configuration Menu.
A message "Clear Configuration?" appears.
- 3** Click [Yes].
Array is deleted.
- 4** Press the [Esc] key to exit SATA Setup Utility.
→"2.1.1 Starting and Exiting SATA Setup Utility" (pg.24)

2.3 Displaying Logical Drive/Hard Disk Information

This section explains how to display information of logical drive and hard disk connected to this array controller.

- 1** Start up SATA Setup Utility.
→"2.1.1 Starting and Exiting SATA Setup Utility" (pg.24)
- 2** Select [View / Add Configuration] from the Configuration Menu, and press the [Enter] key.
The [View / Add Configuration - ARRAY SELECTION MENU] screen appears.

Viewing configuration



Displaying each hard disk information

Select a hard disk with cursor keys. The hard disk information appears at the bottom of the screen.

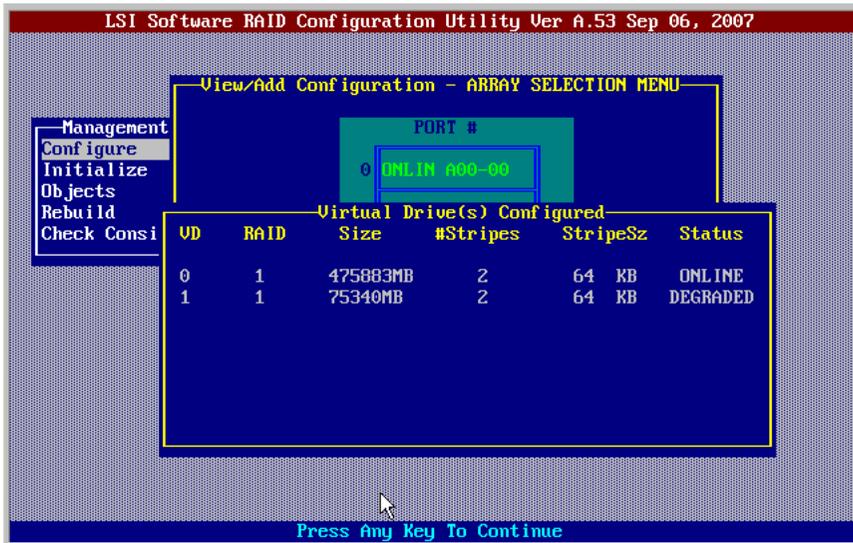


If the array controller does not recognize the hard disk composes logical drive, the information is displayed as follows.



Displaying a list of logical drives

Press [F3] key to display [Virtual Drive(s) Configured] screen.



Pressing any key takes you back to the [View/Add Configuration - ARRAY SELECTION MENU] screen.

3 Press the [Esc] key.

This takes you back to the Configuration Menu.

2.4 Rebuilding Logical Drive

Follow the procedure below to rebuild on SATA Setup Utility.

POINT

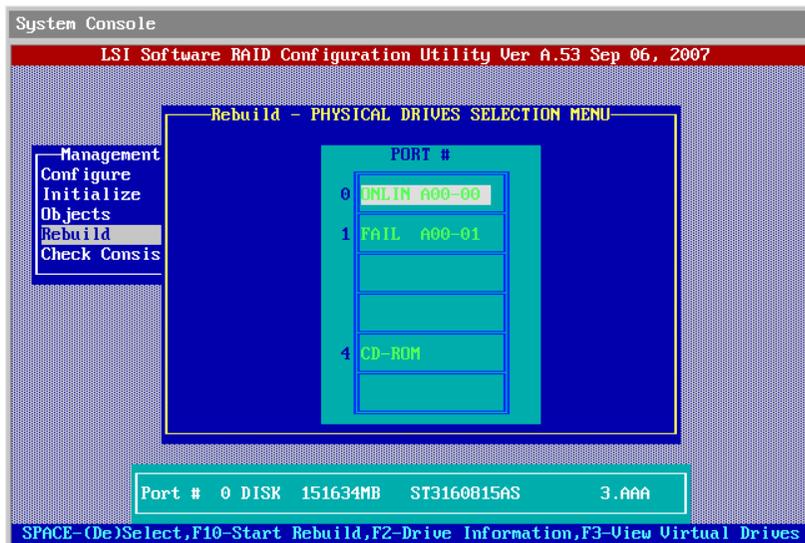
- ▶ Normally, before rebuilding, you need some operations, such as specifying the target hard disk from event logs. For the procedure, see "Chapter 5 Replacing Hard Disk".

1 Start up SATA Setup Utility.

→"2.1.1 Starting and Exiting SATA Setup Utility" (pg.24)

2 Select [Rebuild] from Management Menu, and press the [Enter] key.

The [Rebuild - PHYSICAL DRIVES SELECTION MENU] screen appears.



3 Place the cursor over the hard disk indicating "FAIL", and check the status.

If the message appears as follows although a hard disk is actually connected, some parts other than a hard disk may be failed.



If the hard disk information does not displayed although you replace the hard disk with following steps, contact an office listed in the "Contact Information" of "Start Guide".

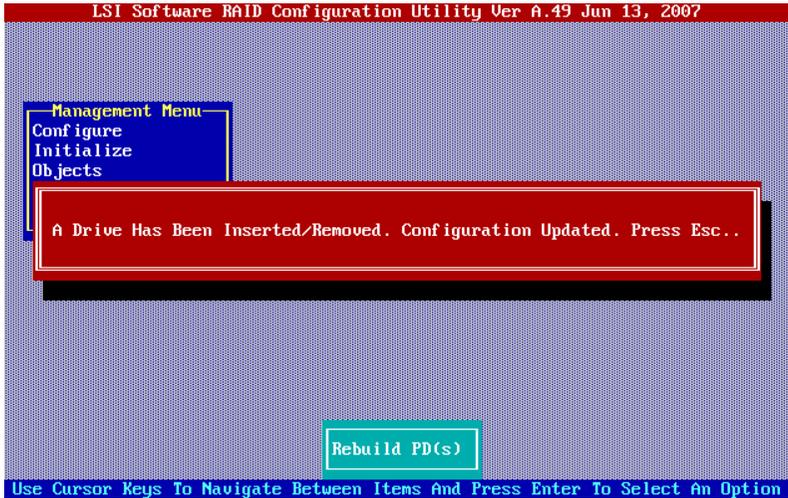
4 Replace the hard disk which is connected to the port indicating "FAIL" with a new one.

POINT

- ▶ For the port number displayed, the actual installation location, and how to remove and install a hard disk, see the "User's Guide" supplied with the server.

Using the server supporting hot swap

The following screen appears when removing/installing a hard disk is detected. Press the [Esc] key to return to the Management Menu.



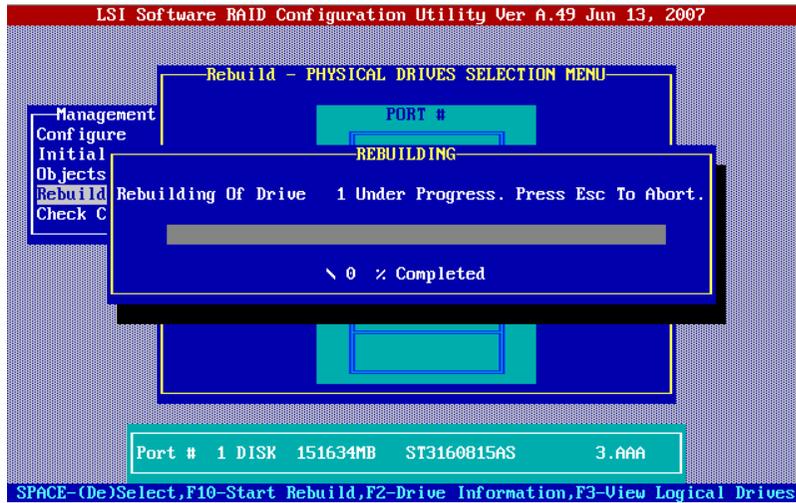
Using the server not supporting hot swap

Turn off the power and replace the hard disk. After the reboot, display the [Rebuild - PHYSICAL DRIVES SELECTION MENU] screen by taking step 1 and 2. Then skip to step 6.

- 5** Select [Rebuild] again from the Management Menu, and press the [Enter] key. The [Rebuild - PHYSICAL DRIVES SELECTION MENU] screen appears.
- 6** Select the hard disk indicating "FAIL", and press the [Space] key. The selected hard disk is displayed with red color.
- 7** Press the [F10] key. A message "Rebuilding Of Drive Will Take A Few Minutes. Start Rebuilding Drive (Y/N)?" appears.

8 Press the [Y] key.

Rebuilding starts and the progress bar appears.



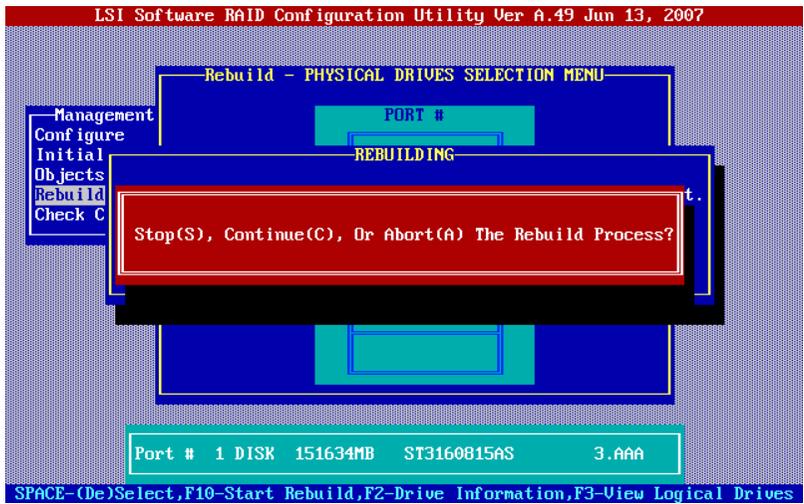
When rebuilding is completed, "Rebuilding Of Drive X Completed Successfully. Press Esc.." appears.

9 Press the [Esc] key.

It takes you back to the Management Menu.

POINT

- ▶ To work on something else during rebuild, press the [Esc] key. The following menu appears.



On this menu, the following functions are available by pressing the [S], [C] or [A] key.

Stop (S)	Stops rebuild. Rebuild is resumed from where it was stopped the next time you perform rebuild or restart the system.
Continue (C)	Restarts rebuild.
Abort (A)	Aborts rebuild. Rebuild is resumed from the beginning the next time.

2.5 Initializing Logical Drive and Hard Disk

This section explains how to initialize logical drives and hard disks with this array controller.

2.5.1 Initializing Logical Drive

There are two methods to initialize logical drives: fast initialization and full initialization.

With fast initialization, only the first and last 8MB of a logical drive are initialized, and the OS partition is deleted. The fast initialization takes a few to several tens of seconds to complete.

With full initialization, the entire logical drive is initialized. The full initialization takes approximately 3 minutes per 1GB.

→"1.3.1 Logical Drive Initialization" (pg.17)

1 Start up SATA Setup Utility.

→"2.1.1 Starting and Exiting SATA Setup Utility" (pg.24)

2 Select a method to initialize.

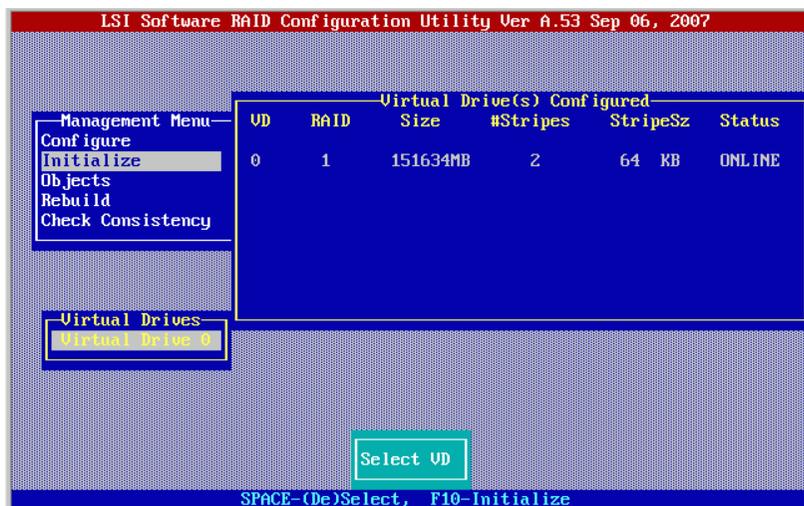
1. Select [Objects] from Management Menu, and press the [Enter] key.
2. Select [Adapter], and press the [Enter] key.
3. Set [Fast Init] as [Enable] or [Disable].

For fast initialization, set as [Enable]. For full initialization, set as [Disable].

→"2.1.5 Objects" (pg.27)

3 Select [Initialize] from the Management Menu, and press the [Enter] key.

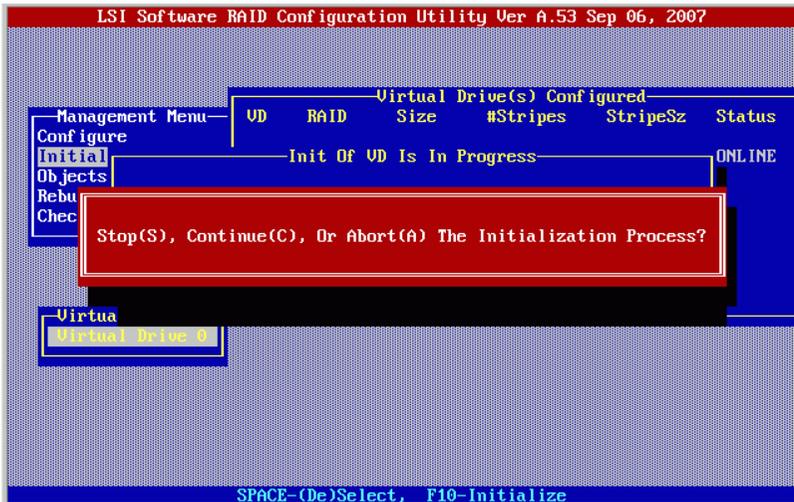
The [Virtual Drives] and [Virtual Drive(s) Configured] screens appear.



- 4** Select the logical drive to be initialized, and press the [Space] key.
The selected logical drive is highlighted.
- 5** Press the [F10] key.
A message "Initialize?" appears.
- 6** Select [Yes], and press the [Enter] key.
Initialization starts, and the progress bar appears.
When the initialization is completed, "VD X Initialization Complete. Press Esc.." appears.
- 7** Press the [Esc] key to return to the Management Menu.

POINT

- ▶ To work on something else during the initialization, press the [Esc] key.
The following menu appears.



On this menu, the following functions are available by pressing the [S], [C] or [A] key.

Stop (S)	Stops the initialization process. The process is resumed from where it was stopped the next time you initialize logical drives or restart the system.
Continue (C)	Restarts the initialization process.
Abort (A)	Aborts the initialization process. The process is resumed from the beginning the next time.

2.5.2 Initializing Hard Disk

In any of the following situations, initialize hard disks: when using a previously used hard disk on other systems, or using it on the same system but changing RAID Level when it is reconfigured.

POINT

- ▶ When you purchase this product, the procedure below is not necessary because it is already initialized.

1 Configure array on SATA Setup Utility.

→"2.2 Configuring/Deleting Array" (pg.32)

POINT

- ▶ With this procedure, you cannot initialize hard disks with different capacity at the same time. Configure an array with hard disks of the same capacity, and follow the procedure below on each array.

2 Enable full initialization.

1. Select [Objects] from Management Menu, and press the [Enter] key.
2. Select [Adapter], and press the [Enter] key.
3. Set [Fast Init] as [Disable].

→"2.1.5 Objects" (pg.27)

3 Select [Initialize] from the Management Menu, and press the [Enter] key.

The [Virtual Drives] and [Virtual Drive(s) Configured] screens appear.

4 Select the logical drive to be initialized, and press the [Space] key.

The selected logical drive is highlighted.

5 Press the [F10] key.

A message "Initialize?" appears.

6 Select [Yes], and press the [Enter] key.

Full initialization starts and the progress bar appears.

When the full initialization is completed, "VD X Initialization Complete. Press Esc.." appears.

POINT

- ▶ Full initialization takes approximately 3 minutes per 1GB.
→"1.3.1 Logical Drive Initialization" (pg.17)

7 Press the [Esc] key twice, and return to the Management Menu.**8** Delete arrays.

→"2.2.4 Deleting Array Configuration" (pg.40)

9 Turn off the server, and remove the hard disk unit which has initialized.

For how to remove the hard disk unit, see the "User's Guide" on the PRIMERGY Startup Disc supplied with the server.

POINT

- ▶ Another way to initialize a hard disk is as follows:
Select [Objects] (→pg.27) – [Virtual Drive] (→pg.29) – [Initialize].

Chapter 3

Preparations

3

This chapter explains how to update device drivers.

3.1 Updating Device Drivers	52
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3.1 Updating Device Drivers

This section explains how to update device drivers installed on the server. Before the update, a driver disk must be created using the "Array Controller Document & Tool CD".

IMPORTANT

- ▶ Even if the OS is newly installed on the server, the driver need to be updated when those included on the "Array Controller Document & Tool CD" are the latest version. For the latest information on the software supplied with the array controller, such as "Array Controller Document & Tool CD", refer to the Fujitsu PRIMERGY website (<http://primergy.fujitsu.com>).

3.1.1 Creating Driver Disk

Before updating device drivers, create a driver disk from the "Array Controller Document & Tool CD" with the following procedure.

- 1** Prepare a formatted floppy disk.
- 2** Insert the "Array Controller Document & Tool CD" into the CD/DVD drive.
- 3** Copy the driver for the OS to use from the following folder on the CD-ROM to the floppy disk.

Label the floppy disk with the floppy disk name as follows:

table: Driver disk

OS	Folder Name	Floppy Disk Name
Windows Server 2003	\DRIVERS\SCSI\LSI \MegaSR\w2k3	Embedded MegaRAID SATA Windows Server 2003 Drivers Disk
Windows Server 2003 x64	\DRIVERS\SCSI\LSI \MegaSR\w2k3x64	Embedded MegaRAID SATA Windows 2003 for x64 Edition Drivers Disk

POINT

- ▶ For the version number of the device drivers, see ReadmeEN.html on the "Array Controller Document & Tool CD".

3.1.2 Updating Driver (Windows Server 2003)

- 1** Log on to Windows with Administrator privileges.
- 2** Exit all programs before updating.
- 3** Click the [Start] button – [Control Panel] – [System].

- 4** Select the [Hardware] tab, and click [Device Manager].
- 5** Double-click [SCSI and RAID Controller].
A SCSI adapter list appears.
- 6** Double-click the [LSI Logic Embedded MegaRAID] icon.
The [Properties] window appears.
- 7** Select the [Driver] tab, and click [Update Driver].
The [Hardware Update Wizard] window appears.
- 8** Select [No, not this time], and click [Next].
- 9** Select [Install from a list or specific location], and click [Next].
- 10** Select [Don't search. I will choose the driver to install.], and click [Next].
- 11** Insert the following floppy disk in the floppy disk drive, and click [Have Disk].
 - For Windows Server 2003
"Embedded MegaRAID SATA Windows Server 2003 Drivers Disk"
 - For Windows Server 2003 x64
"Embedded MegaRAID SATA Windows 2003 for x64 Edition Drivers Disk"
- 12** Enter "A:\\" in [Copy manufacturer's file from] and click [OK].
- 13** Select [LSI Logic Embedded MegaRAID] from the model field, and click [Next].
The files are copied.
- 14** When file copying is finished, click [Done] and close the [Hardware Update Wizard] window.
- 15** Click [Close] to close the [Properties] window.

 **POINT**

- ▶ If the [Change System Settings] window appears, click [No].

- 16** Restart the system when the device driver has been updated.

 **POINT**

- ▶ To see if the device driver is correctly read, check that the following controller is displayed in [SCSI and RAID controller] of the Device Manager.
 - LSI Logic Embedded MegaRAID
 Also, to check the version of the device driver that is being read, double-click the controller name above, select the [Driver] tab and see the version information.

4

Chapter 4

Array Management [ServerView RAID]

This chapter contains an overview of and product requirements for ServerView RAID Manager, and describes how to install and use the program.

4.1	Requirements for ServerView RAID	56
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4.1 Requirements for ServerView RAID

This section describes ServerView RAID.

ServerView RAID is used to monitor, manage, maintain, and configure the array controller and hard disks and logical drives that are connected to the array controller.

4.1.1 ServerView RAID Overview

This software runs on the OS to monitor and manage the array controller.

ServerView RAID is an application that allows you to manage a disk array system connected to the array controller (RAID controller).

Using ServerView RAID, which is a client-server application, you can manage the array controller via a network as well as in a standalone environment.

ServerView RAID includes the ServerView RAID service and ServerView RAID Manager.

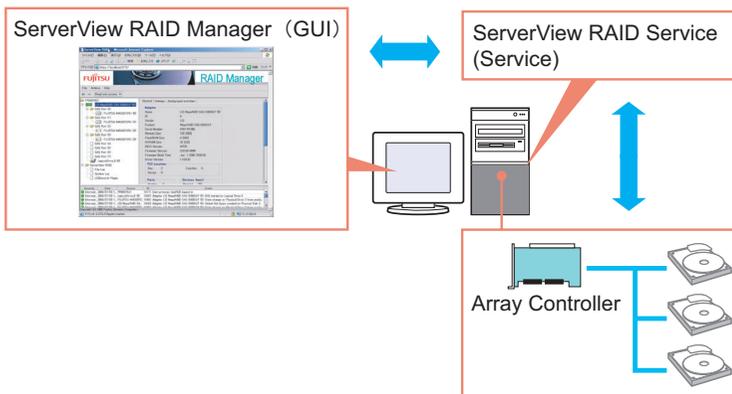
The ServerView RAID service and ServerView RAID Manager use HTTPS to communicate with each other.

- **ServerView RAID service**

This is installed on the server. This program operates as an OS service and monitors the behavior of the array controller.

- **ServerView RAID Manager**

This is a graphical user interface that uses a Web browser and Java. You manage and configure the array controller with ServerView RAID Manager.



IMPORTANT

- ▶ To ensure stable operation of PRIMERGY, install ServerView RAID when using the array controller. If ServerView RAID is not installed, failures will not be detected. You will also be unable to perform maintenance correctly.
- ▶ Only start ServerView RAID Manager when management or maintenance of arrays is necessary. From a security standpoint, it is not recommended to run ServerView RAID Manager continuously. If the accessed server shuts down while you are logged in to ServerView RAID Manager, ServerView RAID Manager cannot communicate with the ServerView RAID service and cannot respond, making it impossible to operate ServerView RAID Manager. In this case, close the Web browser in which ServerView RAID Manager is running.
- ▶ ServerView RAID uses SSL to encrypt communication. Since server certification is not supported, you are responsible for ensuring the reliability of the network and the server.

4.1.2 Requirements for ServerView RAID

An appropriate server environment is required for using ServerView RAID properly. Make sure that the following requirements are met.

■ ServerView RAID (Server requirements)

You must have the following environment to use ServerView RAID.

table: Requirements for ServerView RAID

Category	Description	
	For Windows	For Linux
Hard disk	150MB or more free space in the installation partition of the OS	150MB or more free space under /opt
Application	TCP/IP, SNMP service, and ServerView must be installed	
OS	OS supporting servers with this array controller installed	
Web browser	Internet Explorer 6 or later	Mozilla Firefox 1.0.4 or later SeaMonkey 1.0.3 or later
Java	Java™ 2 Runtime Environment Standard Edition V1.5.0_06 or later	

IMPORTANT

- ▶ Make sure to install device drivers and ServerView RAID specified by Fujitsu.
- ▶ Make sure to configure the network settings properly. If there is a problem with the network configuration, you may be unable to monitor the status of arrays by ServerView or events may not be notified.
- ▶ To monitor the array controller, see the OS event log notified by ServerView (Source: Fujitsu ServerView Services). For the list of logs notified by ServerView, see "Appendix A List of ServerView RAID Event Logs" (→pg.128).

■ ServerView RAID Manager (when managed from a client PC)

When ServerView RAID Manager is used on a client PC different from the server, the following environment is required for the client PC.

table: Requirements for ServerView RAID Manager

Category	Description
Network	Network connection with TCP/IP available
Input device	A mouse or other pointing device
Processor	Pentium® 500MHz or higher (1GHz or higher recommended)
Memory	512MB or more (1GB or more recommended)
Monitor	800 × 600 or better resolution (1024 × 768 or more recommended), 256 or more colors
OS	Windows Server 2003 SP1 or later Windows XP Windows 2000 Server Service Pack 4 or later Windows 2000 Professional Service Pack 4 or later
Web browser	Internet Explorer 6 or later
Java	Java™ 2 Runtime Environment Standard Edition V1.5.0_06 or later

4.1.3 Access Privileges to ServerView RAID

To use the ServerView RAID functions, you must log in to ServerView RAID Manager.

When you log in, user authentication is performed against your user account registered with the OS. The available functions depend on the user account. There are two levels of access privileges as shown below:

● User privileges

The User privileges are mainly used to see the status of the array controller, hard disks, and logical drives. To use the User privileges, log in to ServerView RAID Manager with any of the user names and passwords registered with the OS. With User privileges, you can see the detailed information, settings, and status of the RAID subsystems, such as the array controller, hard disks, and logical drives. However, you cannot change the disk array configuration, rebuild hard disks, or modify the parameters for the array controller and ServerView RAID.

POINT

- ▶ The array cannot be configured with User privileges. We recommend that you log in with User privileges unless you need to operate the array or modify the settings.

● Administrator privileges

These privileges are used for management, maintenance, and configuration of the array controller, hard disks, and logical drives. To use the Administrator privileges, log in to ServerView RAID Manager as a user belonging to the "raid-adm" group, the "Administrators" group (for Windows), or "root" group (for Linux). In addition to the functions available with User privileges, it is possible to use all other functions including creating/changing disk array configurations, rebuilding hard disks, making data consistency of logical drives, and changing the hard disk status.

 **IMPORTANT**

- ▶ When using ServerView RAID with Administrator privileges, certain operations may cause loss of data in the array controller. Read this chapter and use ServerView RAID carefully.

 **POINT**

- ▶ You must create the "raid-adm" group. Make sure to create the group with the name "raid-adm".

4.1.4 Using ServerView RAID in Linux Environment

To use ServerView RAID in a Linux environment, you need to install device drivers for Linux and ServerView RAID.

For using Linux, see the PRIMERGY page on the Fujitsu website (<http://primergy.fujitsu.com/>) and refer to information about Linux.

 **POINT**

When using the software in a RHEL5(Intel64), RHEL-AS4(EM64T), or RHEL-ES4(EM64T) environment

- ▶ The Java plug-ins do not work on the servers with the RHEL5(Intel64), RHEL-AS4(EM64T), or RHEL-ES4(EM64T) system. You cannot manage the array controller with ServerView RAID Manager running directly on these servers.
To manage the array controller on servers with the RHEL5(Intel64), RHEL-AS4(EM64T), or RHEL-ES4(EM64T) system, run ServerView RAID Manager on a Windows server or client PC, and manage the array controller remotely.
For the remote management configuration, see "4.2.1 Operations via Network" (→pg.60).

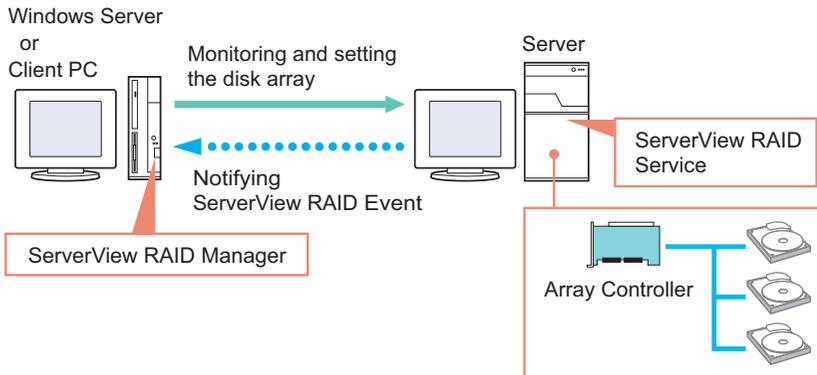
4.2 System Configuration and Event Monitor

This section explains about hardware/network configurations to monitor and manage the server installed this array controller. It also explains how to monitor events.

4.2.1 Operations via Network

In a network environment, arrays on the servers can be monitored and managed from a server or a Windows client PC connected to the network.

To manage the disk array on the server with ServerView RAID installed from ServerView RAID Manager on another server or a client PC, the configuration is as follows:

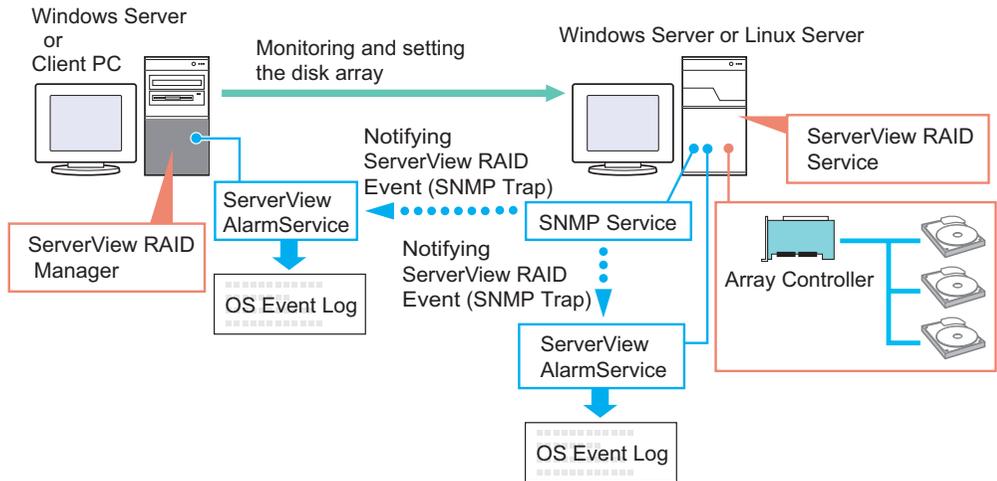


POINT

- ▶ Each ServerView RAID Manager program can manage only one server. To manage disk arrays on multiple servers from a single client PC or server, start one ServerView RAID Manager program for each server.
- ▶ If there is an intervening firewall in the environment, you need to configure the network settings, such as unblocking the port used by the ServerView RAID. ServerView RAID uses the TCP port 3173.

■ Interaction with ServerView AlarmService

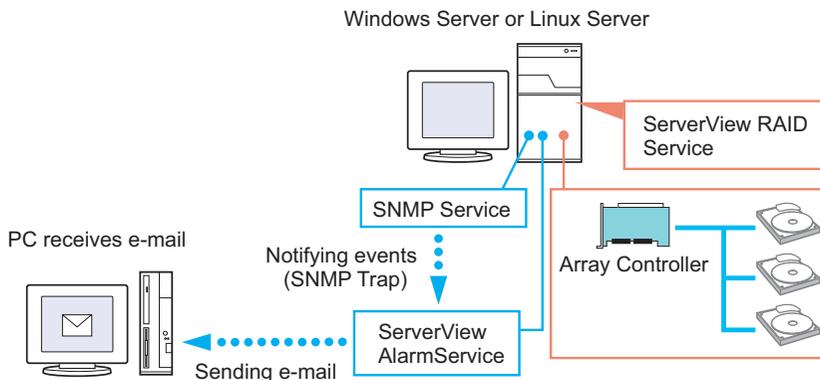
ServerView RAID logs the events of the array controller in the OS event log on the server using ServerView AlarmService. When you monitor the disk array remotely, you can also log the events of the array controller in the OS event log on the client PC by installing ServerView Console or ServerView AlarmService on the client PC. When you install ServerView AlarmService on the client PC as well, the configuration is as follows:



- ▶ Make sure to install ServerView on the server.

4.2.2 Hard Disk Failure Notification via E-mail

Using ServerView AlarmService allows you to receive e-mails which notify the serious events, such as a hard disk failure. For how to set e-mail notifications, see "Appendix B Setting E-mail Notification for Hard Disk Failure" (→pg.145).



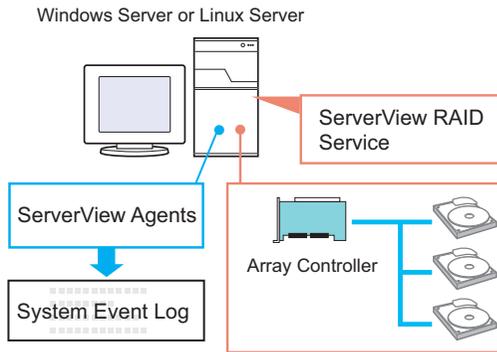
4.2.3 Hard Disk Failure Notification to System Event Log

Installing ServerView Agents on the server with the system event log function allows the server to record events of status changes working with ServerView RAID.

For the information about events, see "5.2.2 Checking with System Event Log" (→pg.115). For how to refer the system event log, see the "User's Guide" supplied with the server.



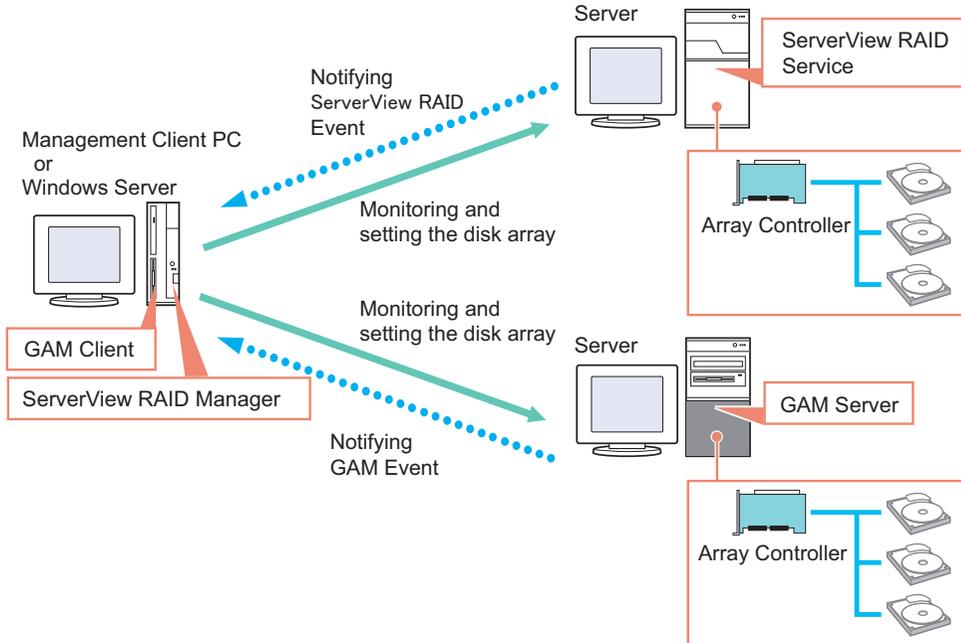
- ▶ To use this function, make sure to install both ServerView RAID and ServerView Agents.



4.2.4 When Using Both ServerView RAID and GAM

When using both ServerView RAID and GAM on a network, you can use ServerView RAID Manager and GAM Client simultaneously on the management client PC or Windows server.

You can use the following configuration:



If ServerView is installed on the management client PC or Windows server, you can start ServerView RAID Manager or GAM Client program for a server managed by ServerView by making use of ServerView's interaction with the RAID Manager. For details about the RAID Manager linking, see "RAID Manager Linking" in the "ServerView User's Guide".

POINT

- ▶ Global Array Manager (GAM) is the service/application to monitor/manage other Fujitsu array controllers.

IMPORTANT

- ▶ To install GAM Client on a Windows server where ServerView RAID is already installed, install only GAM Client. Do not install GAM Server.
- ▶ One GAM Client can manage up to a maximum of 100 GAM Servers. When managing more than 100 servers at the same time, one Windows server or one client PC to be used as GAM Client is necessary per 100 servers.
- ▶ If multiple versions of the GAM Server coexist, use the version of GAM Client that corresponds to the latest version of GAM Server, or a later version.

4.2.5 Monitoring Event Log

This section explains about the event logs which this array controller records and how to use them.

■ Event log file

ServerView RAID event log file is stored as "RAIDLog.xml" (or "RAIDLog<number>.xml") in the following folder.

→ "■ File log" (pg.89)

The event log file may be used for an analysis but not used for monitoring arrays.

For Windows Server 2003	C:\Program Files\Fujitsu Siemens\RAID\web\public\
For Linux	/opt/fsc/RAID/web/public/

■ Log recorded in OS event log

Each log is recorded in OS event log of Windows / Linux as follows.

Not required to monitor the unsupported logs.

● For Windows

table: Log recorded in OS event log

Recorded in	Source	Description
OS event log (Application)	ServerView RAID	The logs which ServerView RAID service directly records in OS event log. →"■ System log" (pg.90)
	Fujitsu Server View Services	The event logs which are sent to ServerView AlarmService from ServerView RAID service. →"Appendix A List of ServerView RAID Event Logs" (pg.128).
OS event log (Application and System)	IDE_RAID_SYS	Not supported.
OS event log (System)	MegaSR	Not supported.

● For Linux

table: Log recorded in OS event log

Recorded in	Source	Description
/var/log/messages	ServerView RAID	The logs which ServerView RAID service directly records in OS event log. →"■ System log" (pg.90)
	FSC ServerView Services	The event logs which are sent to ServerView AlarmService from ServerView RAID service. →"Appendix A List of ServerView RAID Event Logs" (pg.128).
	megasr	Not supported.
	megaswr	Not supported.

4.3 Installing ServerView RAID [Windows]

This section explains how to install ServerView RAID on the Windows server.



- ▶ To monitor the events that occur in the array controller, make sure to install ServerView. And configure event-logging for a monitoring terminal and event notifications via e-mail.
 - "■ Interaction with ServerView AlarmService" (pg.61)
 - "4.2.2 Hard Disk Failure Notification via E-mail" (pg.61)

4.3.1 How to Install ServerView RAID

Follow the procedure below to install ServerView RAID.

- 1** Log on to Windows with Administrator privileges.
- 2** Before installing ServerView RAID, complete the following preparations:
 - Make sure that ServerView is installed and working properly.
 - Insert the Array Controller Document & Tool CD supplied with this product into the CD/DVD drive.
 - Exit all applications.



- ▶ Exit all applications before starting the installation. In particular, if you install the software while Event Viewer, Services, or Computer Management is running, the installation may fail.

- 3** Click the [Start] button – [Run...]. Enter the following path and click [OK].
 [CD/DVD drive]:\RAIDTOOL\SVRAID\Windows\install.bat
 The message "Installation of ServerView RAID has started." is displayed at the command prompt, and the installation of ServerView RAID begins.
- 4** When the message "Installation of ServerView RAID has finished." is displayed at the command prompt, press the [Enter] key.
 The command prompt window closes.
- 5** Restart the system.

- 6** When you newly installed ServerView RAID, once the system is up and running, create and configure a Windows user account.

User Account for Administrator Privileges

1. Create a user account for the Administrator privileges of ServerView RAID.
2. Create the "raid-adm" group.
3. Configure the user account for the Administrator privileges so that it belongs to the "raid-adm" group or the Administrators group.

User Account for User Privileges

1. Create a user account for the User privileges of ServerView RAID.
Do not include the user account for the User privileges in the "raid-adm" group.

IMPORTANT

- ▶ When creating an account for ServerView RAID, uncheck the [User must change password at next logon] checkbox.
Normally, the [Password never expires] checkbox should be checked. Unless the account is configured as above, you may be unable to log in to ServerView RAID Manager properly, because the program will consider the user account invalid without displaying any warning message if the account password has expired or has not been set.

POINT

- ▶ Create each user account as an OS user account.
- ▶ You must create the "raid-adm" group. Make sure to create the group with the name "raid-adm".

4.3.2 How to Uninstall ServerView RAID

Follow the procedure below to uninstall ServerView RAID.

IMPORTANT

- ▶ In general, do not uninstall ServerView RAID.

- 1** Log on to Windows with Administrator privileges.

IMPORTANT

- ▶ Exit all programs before starting the uninstallation.
If you uninstall the software while Event Viewer, Services, or Computer Management is running, the uninstallation will fail. Make sure to exit all programs.

- 2** Click the [Start] button – [Settings] – [Control Panel].
- 3** Double-click [Add or Remove Applications] (or [Add or Remove Programs] depending on the OS).

- 4** Select [ServerView RAID] from the application list and click [Delete] (or [Change/Remove] depending on the environment).

The message "Are you sure you want to remove ServerView RAID from the computer?" appears.

5 Click [Yes].

The uninstallation process starts.

6 When the following message appears after the uninstallation, click [Yes].

You must restart your system for the configuration changes made to ServerView RAID to take effect...

The system restarts.

4.4 Installing HDD Check Scheduler [Windows]

HDD Check Scheduler is a tool to detect or recover media errors on hard disks, by periodically performing Make Data Consistent of the media. This section explains how to install HDD Check Scheduler on a Windows server.

IMPORTANT

- ▶ Make sure to install HDD Check Scheduler. Also, make sure to install ServerView RAID before installing HDD Check Scheduler.
- ▶ During the HDD check, the I/O performance for the logical drives decreases to some extent (up to about 50%). After the installation, set the start time so that the check is performed during non-business hours, or low-business hours, referring to "4.4.2 Modifying HDD Check Start Time" (→pg.69). When you install HDD Check Scheduler, the check is set to start every day at 12:00 by default.
- ▶ If the server restarts or shuts down during the HDD check, HDD check is resumed from where it was stopped the next time.

POINT

- ▶ For an overview of the HDD Scheduler functions, see "1.3.5 HDD Check Scheduler" (→pg.19).
- ▶ HDD Check Scheduler performs Make Data Consistent periodically using the standard OS scheduling function (AT command for Windows, or Cron for Linux).
- ▶ We recommend that you perform the HDD check at least once a week.

4.4.1 Installing HDD Check Scheduler

Follow the procedure below to install HDD Check Scheduler.

- 1** Log on to Windows with Administrator privileges.
- 2** Before installing HDD Check Scheduler, complete the following preparations:
 - Check that ServerView RAID is installed.
 - Make sure that ServerView is installed and working properly.
 - Insert the Array Controller Document & Tool CD supplied with this product into the CD/DVD drive.
 - Exit all applications.

IMPORTANT

- ▶ Exit all applications before starting the installation. In particular, if you install the software while Event Viewer, Services, or Computer Management is running, the installation may fail.

- 3** Click the [Start] button – [Run...]. Enter the following file name and click [OK].
 [CD/DVD drive]:\RAIDTOOL\HDDCS\Windows\install.bat
 The message "Installing HDD Check Scheduler." is displayed at the command prompt.

- 4** When the message "Installation of HDD Check Scheduler has finished." appears, press the [Enter] key.
The command prompt window closes.

POINT

- ▶ When you install HDD Check Scheduler for the first time, the HDD check is set to start every day at 12:00 by default.
- ▶ If you reinstall and overwrite HDD Check Scheduler, the previously set start time setting will be kept.

4.4.2 Modifying HDD Check Start Time

The start time for HDD check can be modified using the AT command of the operating system. To modify the start time, follow the procedure below.

POINT

- ▶ We recommend that you perform the HDD check regularly, at least once a week.

- 1** Log on to Windows with Administrator privileges.
- 2** Click the [Start] button – [All Programs] – [Accessories] – [Command Prompt] to open the command prompt.
- 3** Type "AT" and press the [Enter] key.
- 4** Write down the ID value for the row with the following value in the [Command Line] column:
C:\Program Files\Fujitsu Siemens\RAID\FJutils\HDDchk.bat

Example: If the AT command output is as follows, the ID is 13.

```
C:\Documents and Settings\Administrator>at
Status ID Day Time Command Line
-----
1 Each M F 10:00 AM "C:\Program Files\Fujitsu
\F5FBFE01\ServerView Services\WebServer\ClearMyLogs.exe"
13 Each M T 12:00 PM "C:\Program Files\Fujitsu
Siemens\RAID\FJutils\HDDchk.bat"
```

- 5** Delete the currently registered HDD check schedule.

Execute the following command:

```
AT <ID in step 4> /delete
Example: AT 13 /delete
```

- 6** Register a new schedule. Using the AT command, register the following command line together with the time of execution.

C:\Program Files\Fujitsu Siemens\RAID\FJutils\HDDchk.bat

To specify the scheduled execution, enter the following AT command.

```
AT <Start Time> /every:<Day of Week> "Command Line"
```

- To execute the HDD check every Friday at 18:00

```
AT 18:00 /every:F "C:\Program Files\Fujitsu
Siemens\RAID\FJutils\HDDchk.bat"
```

- To execute the HDD check every day at 21:00

```
AT 21:00 /every:M,T,W,Th,F,S,Su "C:\Program Files\Fujitsu
Siemens\RAID\FJutils\HDDchk.bat"
```

POINT

- ▶ To specify the day of the week, use the following abbreviations:

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
M	T	W	Th	F	S	Su

- ▶ For details on how to use the AT command, see Windows Help.

4.4.3 Checking HDD Check Scheduler

To see whether the HDD check is properly executed, check the OS application log as follows:

POINT

- ▶ Each "x" in the descriptions indicates a string of characters or digits, depending on your operating environment.
- To see whether the HDD check is properly executed at the specified time, check that log entry is recorded at the specified time as follows. If no log entries are recorded at the specified time, review the settings.

```
Source      : Fujitsu ServerView Services
Type       : Information
Event ID    : 1
Description: Adapter LSI Logic Embedded MegaRAID (0): MDC started on
logical drive (0) (Server xxx)
```

- To see whether the HDD check is properly completed, check that log entry is recorded as follows. If log entries are not recorded at the specified intervals (more than once/week is recommended), review the settings.

```
Source      : Fujitsu ServerView Services
Type       : Information
Event ID   : 1
Description: Adapter LSI Logic Embedded MegaRAID (0): MDC finished on
logical drive (0) (Server xxx)
```

4.4.4 Uninstalling HDD Check Scheduler

To uninstall HDD Check Scheduler, follow the procedure below.

- 1** Log on to Windows with Administrator privileges.
- 2** Click the [Start] button – [All Programs] (or [Programs]) – [Accessories] – [Command Prompt].
A command prompt window opens.
- 3** Type "AT" and press the [Enter] key.
- 4** Write down the [ID] value for the row with the following value in the [Command Line] column:
C:\Program Files\Fujitsu Siemens\RAID\FJutils\HDDchk.bat

Example: If the AT command output is as follows, the ID is 13.

```
C:\Documents and Settings\Administrator>at
Status ID Day Time Command Line
-----
1 Each M F 10:00 AM "C:\Program Files\Fujitsu
\F5FBFE01\ServerView Services\WebServer\ClearMyLogs.exe"
13 Each M T 12:00 PM "C:\Program Files\Fujitsu
Siemens\RAID\FJutils\HDDchk.bat"
```

- 5** Delete the currently registered HDD check schedule.
Execute the following command:

```
AT <ID in step 4> /delete
Example: AT 13 /delete
```

4.5 Starting and Exiting ServerView RAID Manager

This section explains how to start and exit ServerView RAID Manager.

4.5.1 Preparations and Precautions for using ServerView RAID Manager

You need to configure the Web browser settings before using ServerView RAID Manager. Also, note the following precautions:

● General precautions

- ServerView RAID Manager uses a Java plug-in. Make sure to install Java on the server or client PC on which you use ServerView RAID Manager. If Java is not already installed, see "Installing Java™ 2 Runtime Environment Standard Edition" under "Chapter 2 Installation" in the "ServerView User's Guide" on the PRIMERGY Startup Disc, and install Java.
- On servers with the RHEL5(Intel64), RHEL-AS4(EM64T) or RHEL-ES4(EM64T) system, Java plug-ins do not work. Therefore, when you want to manage the array controller in RHEL5(Intel64), RHEL-AS4(EM64T) or RHELES4(EM64T) environment, you need a separate Windows server or client PC to run ServerView RAID Manager.
- When using ServerView RAID Manager on the server, do not use proxy servers for the IP address and localhost.
- Do not use the [Back], [Forward], and [Refresh] buttons in the Web browser.

● When using Internet Explorer as your web browser

- Enable SSL.
Select [Tools] – [Internet Options] – [Advanced] – [Security], and enable SSL 3.0 and TSL 1.0.
- Start the Web browser and add the zone setting of Web site as follows:
 1. In Internet Explorer, select [Tools] – [Internet Options].
 2. Click the [Security] tab and select [Intranet] (or [Local intranet] for Internet Explorer 7) or [Trusted sites].
 3. Click [Sites] (or [Advanced] for Windows 2000) and add the following URL of the server where you installed ServerView RAID: `https://<the name or IP address of the server>`.
 4. Click [Close].
 5. Click [Custom Level].
 6. Set [Enable] for [Run ActiveX controls and plug-ins].

● When using Mozilla Firefox / SeaMonkey as your web browser

Select [Edit] – [Configuration], and enable the following items in the configuration window:

- [SSL 2.0] and [SSL 3.0]
- [Enable Java]

4.5.2 Starting and Logging in ServerView RAID Manager

You can start ServerView RAID Manager in several ways as follows:

● Starting from the [Start] button

Start ServerView RAID Manager from the [Start] button.

This method can only be used on the Windows server on which ServerView RAID is installed.

● Starting from ServerView

Start ServerView RAID Manager by utilizing the RAID Manager linking function of ServerView.

For information about how to start ServerView RAID Manager from ServerView, see "RAID Manager Linking" in the "ServerView User's Guide" on the PRIMERGY Startup Disc.

● Starting by specifying the server name or IP address directly

Start ServerView RAID Manager by specifying the host name or IP address of the server directly. Using this method, you can manage the array controller on the server from a remote client PC.

1 Start ServerView RAID Manager.

Starting from the the [Start] button

1. Click the [Start] button – [All Programs] (or [Program]) – [Fujitsu Siemens] – [ServerView RAID Manager Start].

Starting by specifying the server name or IP address directly

1. Start the Web browser.
2. Type the following URL and press the [Enter] key.
https://<the name or the IP address of the server>:3173/

POINT

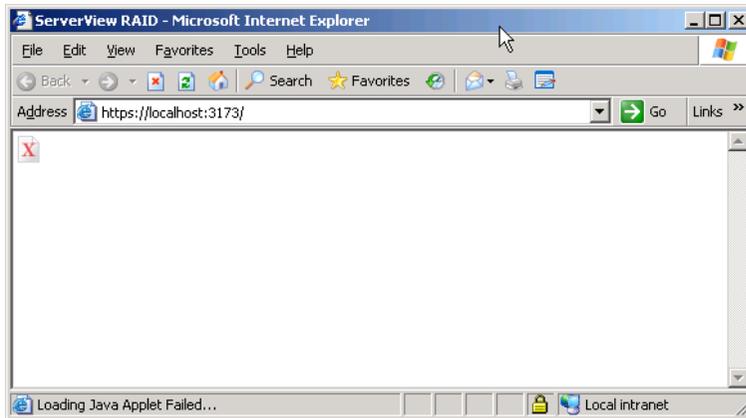
- ▶ If a security alert message appears, click [Yes] to continue.
- ▶ If the following message appears on the startup of Java, click [Yes] to continue.
 - "The web site's certificate is invalid. Do you want to continue?"
 - "The web site's certificate cannot be verified. Do you want to continue?"
- ▶ If the message "The name of the site does not match the name on the certificate. Do you want to run the application?" appears on the startup of Java, click [Run] to continue.

When ServerView RAID Manager is started, the login window appears.



IMPORTANT

- ▶ If you leave the Java startup popup window open for a long time while starting ServerView RAID Manager, the following window may appear and ServerView RAID Manager cannot be started. In this case, close the Web browser, and start ServerView RAID Manager again.



- ▶ Do not change the language selection button in the login window. Leave it as .

2 Enter a user name in [Username].

- Logging in with Administrator privileges
Enter the user name that belongs to the "raid-adm", "Administrators" (for Windows) or "root" (for Linux) group.
- Logging in with User privileges
Enter a user name that does not belong to the "raid-adm", "Administrators" (for Windows) or "root" (for Linux) group.

3 Type a password in [Password].

4 Click [Login].

The main window of ServerView RAID Manager appears.

POINT

- ▶ If you type a wrong password for logging in, you may be unable to type the password again. In this case, click [Username:], and enter the user account and the correct password.
- ▶ In ServerView RAID Manager, the available functions are limited by the access privileges. For details about access privileges, see "4.1.3 Access Privileges to ServerView RAID" (→pg.58).

4.5.3 Exiting ServerView RAID Manager

This section explains how to exit ServerView RAID Manager.

1 In the ServerView RAID Manager menu bar, click [File] – [Exit].

The login window appears.

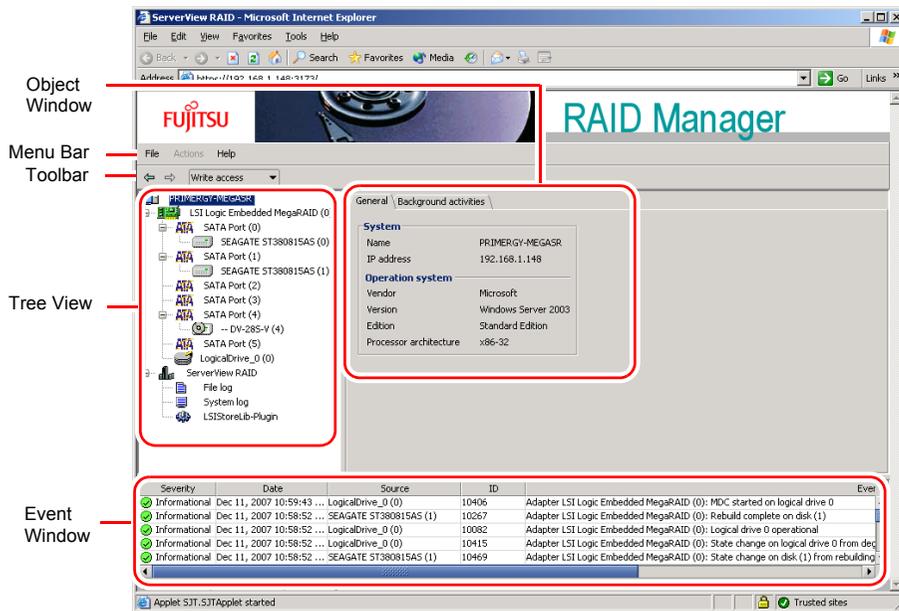
**2** Exit the Web browser.

4.6 ServerView RAID Manager Window Layout

The following provides a description of the windows, buttons, and menu items displayed when using ServerView RAID Manager.

4.6.1 Startup Window Layout and Functions

When ServerView RAID Manager is started, the following main window appears.



■ Object window

The window displays information about the object (device) selected in the tree view. Use the tabs at the top of the object window to switch the information displayed.

- [General] Tab
This tab displays information about the object, such as the IP address, the OS, and the capacities of a hard disk drive and logical drive.
- [Settings] Tab
This tab displays the settings of the object. It also allows you to modify the settings of the object.
- [Layout] Tab
This tab allows you to see the configuration of the object.
- [Background activities] Tab
This tab allows you to see the status of the background tasks currently running for the object.

POINT

- ▶ The information displayed in each tab of the object window varies with the selected object. The [Background activities] tab is not displayed when no background tasks are running.

■ Menu bar

ServerView RAID Manager provides menus for performing various functions.

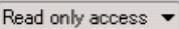
For details on the ServerView RAID Manager menus, see "4.6.2 Menu Layout and Functions" (→pg.78).

■ Toolbar

The toolbar contains the following buttons:

-  (Back/Forward)

These buttons allow you to go back/forward in the object selection history for the tree view.

-  (Change Access Mode)

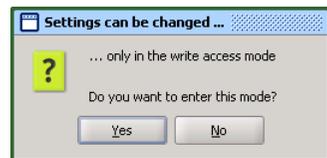
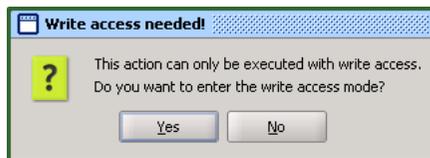
This button allows you to switch the access mode of the object. Access modes represent the operation privileges for ServerView RAID Manager. The following access modes are available:

- Read only access
You can only view the information.
- Write access
You can make any modifications.

When you want to operate the disk array or modify the settings for the controller and logical drives, you must set the Write access mode.

POINT

- ▶ When you log into ServerView RAID with Administrator privileges, you can use the Write access mode. When you log in with User privileges, you can only use the Read only access mode. For details, see "4.5.2 Starting and Logging in ServerView RAID Manager" (→pg.73).
- ▶ When you log in with Administrator privileges in the Read only access mode and perform any modification, such as modifying the settings, the following popup window appears. Click [Yes] to automatically switch the access mode to the Write access mode.



■ Tree view

The tree view displays all the objects related to the array controller as icons in a tree.

For details, see "4.6.3 Layout of Tree View" (→pg.81).

■ Event window

ServerView RAID monitors the operation of the array controller and hard disks connected to the controller.

When any behavior that is considered as an event (for example, a failure of a hard disk or an allocation of a spare disk drive) occurs, ServerView RAID Manager is notified of it and displays it in the event window. The following information is displayed.

table: Event window

Event	Description
Severity	Priority level of the event. The following icons are used:  Information  Warning  Error
Date	Date and time when the event occurred.
Source	Object (device) where the event occurred.
ID	ID of the event
Event	Event description



- ▶ For monitoring the array controller, use the OS event log. For more information, see "4.2.5 Monitoring Event Log" (→pg.63).
ServerView RAID Manager displays only the last 100 events in the event window.
For example, if you start ServerView RAID Manager after a long interval, you may lose the events for that period, because the old events are overwritten by new events.

4.6.2 Menu Layout and Functions

This section explains the layout and functions of ServerView RAID Manager menu items.

■ [File] menu

table: [File] menu

Menu	Function
Exit	Select this item to close the current session and return to the login window.

■ [Actions] menu



- ▶ The items in the [Actions] menu vary with the object selected in the tree view and the status of the object. Note that grayed out menu items are disabled.
- ▶ The [Actions] menu is the same as the right-click menu for the object selected in the tree view.

● **When selecting array controller**

table: [Actions] menu (When selecting an array controller)

Menu	Function
Scan configuration	Redetects all devices connected to the array controller, and updates the status to the latest one.
Create logical drive	Sets a disk array configuration. It is not supported to set a disk array configuration on ServerView RAID. Use SATA Setup Utility instead. →"2.2 Configuring/Deleting Array" (pg.32).
Delete all logical drives	Deletes all the logical drives connected to the array controller. Note: ▶ Do not use this function. You will lose all data under the array controller.
Delete last logical drive	Deletes the last created logical drive (i.e. the logical drive with the highest drive number). →"4.8.2 Delete Last Logical Drive" (pg.94)
Clear configuration	Clears all the disk array configurations of the array controller. Note: ▶ Do not use this function. You will lose all data under the array controller.

● **When selecting hard disk**

table: [Actions] menu (When selecting a hard disk)

Menu	Function
Locate device	Turns on the hard disk failure LED to indicate the disk's location.
Stop location	Turns off the hard disk failure LED that was turned on with [Locate Device].
Make online	Forces the status of the failed or offline hard disk to online (Operational). Note: ▶ Do not use this function unless you are instructed to do so, for example during maintenance. You may lose data.
Make offline	Forces the status of the online hard disk to offline (Failed). Note: ▶ Do not use this function unless you are instructed to do so, for example during preventive replacement of a hard disk or during maintenance. You may lose data.
Make ready	This array controller does not use this function.
Start rebuild	Starts rebuild for the selected hard disk.
Cancel rebuild	Stops rebuild running for the selected hard disk. Note: ▶ Do not use this function unless you are instructed to do so, for example during maintenance.
Manage hot spare...	Not supported. Do not use this.

● When selecting logical drive

table: [Actions] menu (When selecting a logical drive)

Menu	Function
Delete logical drive	Not supported. Do not use this.
Locate logical drive	Turns on the failure LEDs of the hard disks that make up the selected logical drive to indicate their locations.
Stop location	Turns off the hard disk failure LEDs that were turned on with [Locate Logical Drive].
Start MDC	Starts the Make Data Consistent for the selected logical drive.
Cancel MDC	Stops the Make Data Consistent running for the selected logical drive.
Cancel BGI	Not supported.
Start rebuild	Starts rebuild for the selected logical drive.
Cancel rebuild	Stops the rebuild running for the selected logical drive. Note: ▶ Do not use this function unless you are instructed to do so, for example during maintenance.
Start initialization	Initializes (deletes data on) the selected logical drive. Note: ▶ If you use this function, all of the data on the target logical drive will be deleted. Please be careful.
Cancel initialization	Cancels the initialization of the selected logical drive in progress.

● When selecting file log

table: [Actions] menu (When selecting a file log)

Menu	Function
Clear log	Deletes the event log file. Note: ▶ Do not use it. Event log files are used for failure investigation. If you delete event log files, it may become difficult to analyze failures.

■ [Help] menu

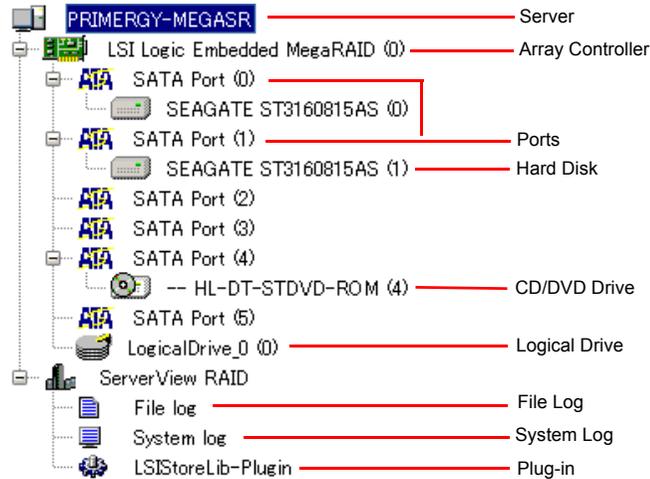
table: [Help] menu

Menu	Function
Info about ServerView RAID	Displays the version information of ServerView RAID.
Contents and index	Not supported.

4.6.3 Layout of Tree View

This section explains the icons in the tree view shown at the left of the main ServerView RAID Manager window.

In the tree view, you can see the status of the hard disks and logical drives.



- **Server**

At the top of the tree, the name of the connected server is displayed.

- **Array controller**

The array controller installed on the server is displayed.

Each controller number is shown in ().

You can see whether logical drives under the array controller are normal.

table: Array controller status icon

Icon	Status	Description
	OK (Normal)	All logical drives under the controller are working normally.
	Warning (Critical)	Some logical drives under the controller are critical (degraded). Or there is failure expected (S.M.A.R.T. error) on the hard disks under the controller.
	Failed (Offline)	Some logical drives under the controller are offline (failed).

POINT

- ▶ To see more detailed information in the object window, select the array controller icon. For more information, see "4.9.2 Checking Array Controller Status" (→pg.98).
- ▶ When the array controller icon is indicating critical or offline, check the status of the logical drives under the array controller and take the necessary measure.

● **Port**

The ports of the array controller are displayed. Each port number is shown in ().

● **Hard disk**

The vendor names and product names of the hard disks connected to the array controller are displayed.

The device number of each hard disk is shown in ().

You can also see the current status of each hard disk.

table: Hard disk status icon

Icon	Displayed in	Status	Description
	Gray	Online (Operational)	A part of the array and functioning properly
	White	Available	Unused or available
	Gray with an "X" mark	Failure (Failed)	A part of the array but has failed
	Gray with an "X" mark	Offline (Offline)	Forced to be unavailable by the array controller
	White (dotted frame) with an "X" mark	Unrecognizable (Failed (missing))	A part of the array but has failed, and not recognized by the array controller
	Gray	Rebuild (Rebuilding)	Rebuild in progress
	Gray with an "!" mark	Failure Prediction (S.M.A.R.T. error)	Failure expected

POINT

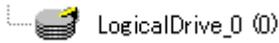
- ▶ To see more detailed information in the object window, select the hard disk icon. Note that you cannot see some information for unrecognizable hard disks. For more information, see "4.9.3 Checking Hard Disk Status" (→pg.100).
- ▶ S.M.A.R.T. error may appear in combination with another status.

● **CD/DVD drive**

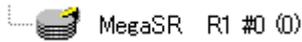
A CD/DVD drive connected to the array controller is displayed. With ServerView RAID, monitoring a CD/DVD drive is not supported.

● **Logical drive**

Logical drives created under the array controller are displayed. Each logical drive number is shown in ().



A logical drive label name may be displayed as follows: For the logical drive number, always see the number in ().



You can also see the current status of each logical drive with icons.

[table: Logical drive status icon](#)

Icon	Status	Description
	Online (Operational)	Normal
	Critical (Degraded)	Operating without redundancy
	Offline (Failed)	Not available

POINT

- ▶ To see more detailed information in the object window, select the logical drive icon. For more information, see "4.9.4 Checking Logical Drive Status" (→pg.102).

● **File log, System log, and Plug-in**

You can configure the log files and the OS event log for ServerView RAID. For more information, see "4.7.3 Setting ServerView RAID" (→pg.87).

4.7 Settings

This section explains how to change each parameter for the array controller, logical drives, and event logging.

4.7.1 Viewing and Changing Array Controller Settings

You can view and change array controller settings.



- ▶ The controller settings must be set at the initial values shown in the following table. If the settings are outside of the specified ranges or if you use the controller by default, correct operation may not be ensured.

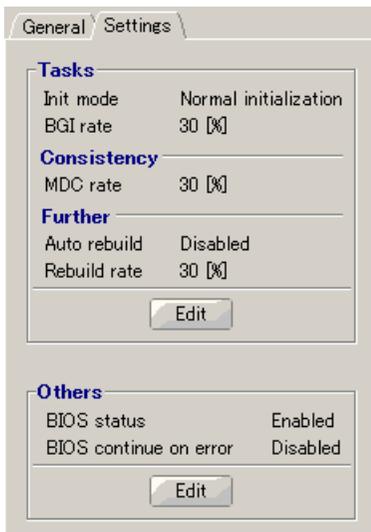
1 Start ServerView RAID and log in with Administrator privileges.

→ "4.5 Starting and Exiting ServerView RAID Manager" (pg.72)

2 In the tree view, select the controller ().

3 Click the [Settings] tab in the object window.

The current settings are displayed in the tab.



4 Click [Edit] to change each setting.

A setting window appears. For the items that can be set, see the following:

- Setting Tasks:
→ "■ Tasks" (pg.85)
- Setting Others:
→ "■ Others" (pg.86)

5 Click [OK].

A confirmation window appears.

6 Click [Apply].

You will see the change reflected on the [Settings] tab in the object window.

■ Tasks

You can change the array controller settings. See the following table and set the initial values.

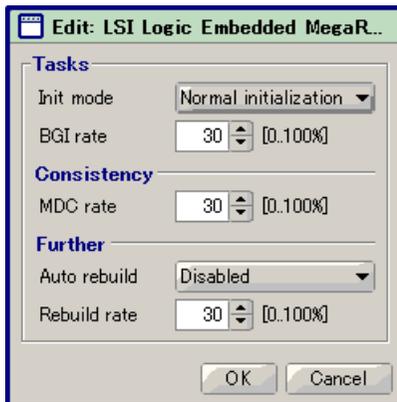


table: Array controller — Tasks

Option	Default Value	Initial Value	Description
Init mode	Normal initialization	Normal initialization	Not supported.
BGI rate	30	30	Not supported.
MDC rate	30	30	Sets the Make Data Consistent priority for normal I/O.
Auto rebuild	Enabled	Disabled	Enables automatic rebuild after a hard disk replacement.
Rebuild rate	30	30	Sets the rebuild priority for normal I/O.

■ Others

You can change the array controller and ServerView RAID settings.
See the following table and set the initial settings.

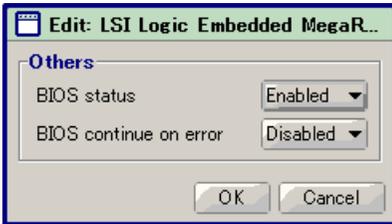


table: Array controller — Others

Option	Default Setting	Initial Setting	Description
BIOS status	Enabled	Enabled	Not supported.
BIOS continue on error	Enabled	Disabled	Enables/disables the function whether to remain at the POST screen when a disk failure is detected during POST which is initializing array controller.

4.7.2 Setting Logical Drive

You can check and change logical drives.

- 1** Start ServerView RAID and log in with Administrator privileges.
→ "4.5 Starting and Exiting ServerView RAID Manager" (pg.72)
- 2** In the tree view, select a logical drive ().
- 3** Click the [Settings] tab in the object window.
The current settings are displayed in the tab.



- 4** Click [Edit] to set each item.
A setting window appears. For items that can be set, see the following:
→ "■ Cache" (pg.87)

IMPORTANT

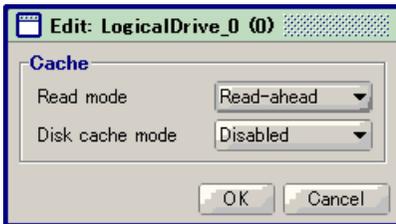
- ▶ Setting up a logical drive name is not supported. Do not use it.

5 Click [OK].
A confirmation window appears.

6 Click [Apply].
You will see the change reflected on the [Settings] tab in the object window.

Cache

The following is a setting window of logical drive access.



IMPORTANT

- ▶ Always use the following settings:
 - Read mode : Read-ahead
 - Disk cache mode : Disabled

4.7.3 Setting ServerView RAID

You can configure the log files and the OS event log for ServerView RAID.

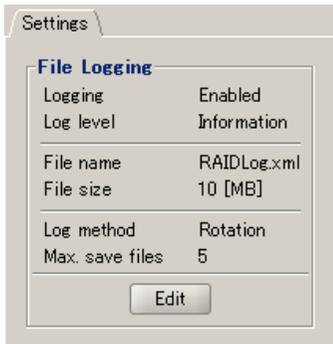
1 Start ServerView RAID and log in with Administrator privileges.
→"4.5 Starting and Exiting ServerView RAID Manager" (pg.72)

2 In the tree view, select the icon you want.



3 Click the [Settings] tab in the object window.
The current settings are displayed in the tab.

When you select File Log in the tree view:



When you select System Log in the tree view:



4 Click [Edit] to set each item.

A setting window appears. For the items that can be set, see the following:

- When you set File Log:
→ "■ File log" (pg.89)
- When you set System Log:
→ "■ System log" (pg.90)

IMPORTANT

- ▶ ServerView RAID, Setting the Multiplexer and the LSISStoreLib-Plugin is not supported, so do not use these items.

5 Click [OK].

A confirmation window appears.

6 Click [Apply].

You will see the change reflected on the [Settings] tab in the object window.

■ File log

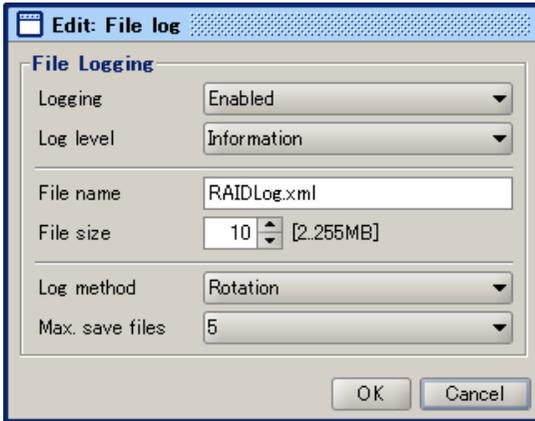


table: File log

Option	Setting		Description
Logging	Enabled	Cannot be changed	Enables event logging to the log file. Always use the program with this option Enabled.
Log level	Information	Cannot be changed	Sets a priority level for events that execute logging. Events that have a priority level equal to or greater than the one set here will be logged in the log file. Do not change this from Information.
File name	RAIDLog.xml	Cannot be changed	Log file name.
File size	10	Cannot be changed	Sets the log file size limit.
Log method	Rotation	Cannot be changed	Sets the method of log rotation.
Max. save files	5	Default	Maximum number of log files. We recommend that you set this value equal to or greater than the default value.

POINT

- ▶ The log files for ServerView RAID are stored as RAIDLog.xml (or RAIDLog<number>.xml) in the following folders:

For Windows Server 2003	C:\Program Files\Fujitsu Siemens\RAID\web\public\
For Linux	/opt/fsc/RAID/web/public/

Do not delete or edit the log files since they may be used for analysis. The used maximum file size is 20MB. Monitoring the log files is not supported.

■ System log



table: System log

Option	Setting		Description
Logging	Enabled	Default	Enables event logging to the OS event log.
Log level	Information	Default	Sets a priority level of events that are logged in the OS event log. Events that have a priority level equal to or greater than the one set here will be logged. Debug is not supported.

POINT

- ▶ ServerView RAID logs events that occur in the array controller in the OS application log as events of the "Source: ServerView RAID". However, when ServerView AlarmService is installed, events that occur in the array controller are logged also as events of the "Source: Fujitsu ServerView Services". For more information, see "4.2.5 Monitoring Event Log" (→pg.63).
- ▶ The event log for which the settings can be changed under System Logging is the one that contains the "Source: ServerView RAID".

4.8 Operating RAID Configuration

This section explains how to make data consistent and rebuild when an array is being configured.

IMPORTANT

- ▶ The server which controller chip is ICH9R cannot recognize new hard disks inserted while OS is working. When you purchase new hard disks and add logical drives, insert them before you turn on the server or add logical drives on SATA Setup Utility.
→"2.2.1 Configuring New Logical Drive" (pg.32)
- ▶ To check the controller chips installed on the server you use, see "4.9.2 Checking Array Controller Status" (→pg.98).

POINT

- ▶ Disk array operations require logging in to ServerView RAID Manager with Administrator privileges. They also require that the access mode is set to [Write access].
For details about access modes, see "■ Toolbar" (→pg.77).

4.8.1 Create Logical Drive

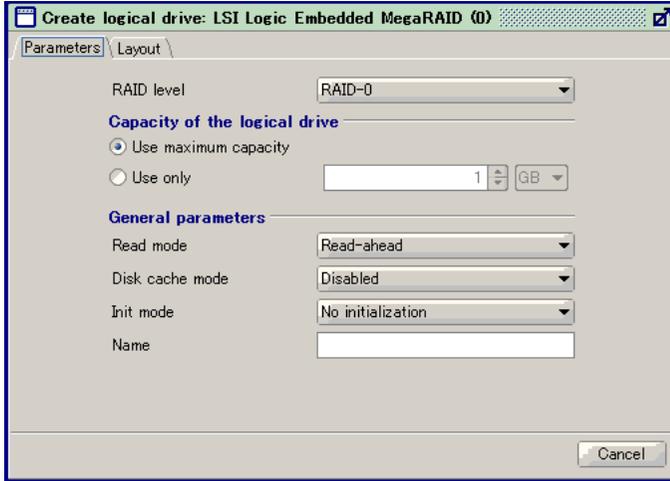
To create a new array configuration, follow the procedure below.

POINT

- ▶ During rebuild, the array structure cannot be configured or deleted. Perform these procedures after the rebuild is completed.
- 1** Start ServerView RAID Manager and log in with Administrator privileges.
→"4.5 Starting and Exiting ServerView RAID Manager" (pg.72)

- 2 In the tree view, select the array controller (), right-click, and then click [Create logical drive] from the displayed menu.

The [Parameters] tab of the Create Logical Drive window appears.



- 3 Select a RAID level for the logical drive.

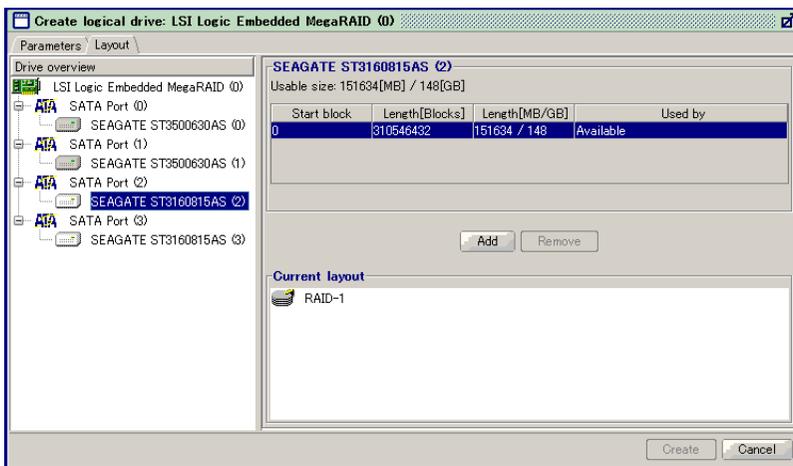
Click ▼ under [RAID level] and select the RAID level for the logical drive from the displayed list.



- ▶ The configurable RAID level is limited according to the number of unused hard disks.
- ▶ Do not change any settings other than RAID level.

- 4 Click the [Layout] tab to allocate a hard disk for a logical drive.

The following window appears.



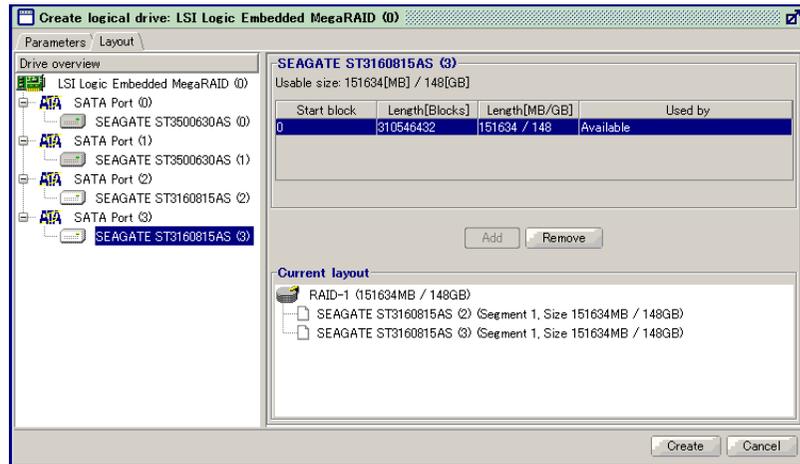
1. In the left tree of the window, select an unused hard disk ().
2. Click [Add].

The hard disk you selected or added is displayed in the Current Layout.

- Repeat steps above to allocate as many hard disks as you need for the RAID level you set.

table: RAID level and necessary number of hard disks

RAID Level	Number of hard disks
RAID 0	1 or more
RAID 1	2



IMPORTANT

- Use hard disks of the same capacity and type within a logical drive. If a mixture of different hard disks is connected, see "4.9.3 Checking Hard Disk Status" (→pg.100) in advance.

When deallocating hard disks from a logical drive

In the [Current layout] area on the left hand of the window, select a hard disk, and click [Remove].

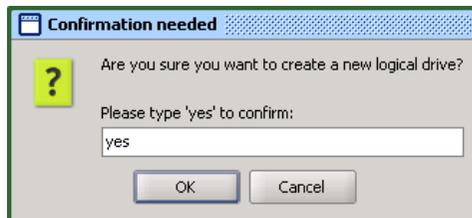
- Click [Create].

POINT

- If you cannot click [Create] because it is grayed out, the number of hard disks may not correspond to the selected RAID level. Review the allocation of hard disks in step 4.

A confirmation window appears.

- Enter "yes" and click [OK].



The new disk array configuration is created.

4.8.2 Delete Last Logical Drive

This section explains how to delete an existing logical drive.

IMPORTANT

- ▶ When you delete logical drives, start deleting them from the last created one (the drive with the highest number.) Do not delete them in any order than starting from the last created logical drive.
- ▶ We recommend that you back up data on all of the logical drives as a safeguard against accidental data loss due to operational errors before you delete logical drives.
- ▶ If a background task is running, wait until the background task finished before you start deleting logical drives.

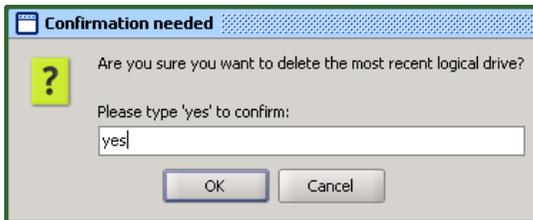
- 1** Back up the data to prepare for unexpected problems.
- 2** Start ServerView RAID Manager and log in with Administrator privileges.
→ "4.5 Starting and Exiting ServerView RAID Manager" (pg.72)
- 3** In the tree view, select the array controller () where the logical drive to be deleted is created, right-click, and then click [Delete last logical drive] from the displayed menu.

IMPORTANT

- ▶ Be careful not to click [Delete all logical drive]. If you click [Delete all logical drive], all the logical drives are deleted at once. Should the wrong logical drive be deleted, click [Cancel] in the confirmation window and start again from the beginning.

A confirmation window appears.

- 4** Enter "yes" and click [OK].



The last created logical drive is deleted.

IMPORTANT

- ▶ If you accidentally delete the wrong logical drives, recreate the array configuration, and then restore the data backed up before the deletion.

POINT

- ▶ If a logical drive is deleted, the hard disks that composed the logical drive will be marked as unused.

4.8.3 Make Data Consistent

Make Data Consistent, also called redundant data regeneration, is a function that regenerates the parity or mirrored data on redundant logical drives and makes the array structure consistent.

When a server failure or a power failure results in a dirty OS shutdown, the array may become inconsistent. When a dirty OS shutdown occurs, perform this function as early as possible.

POINT

- ▶ Make Data Consistent can be performed on logical drives with redundancy, i.e. RAID 1 logical drives in online state (operational). Make Data Consistent cannot be performed on logical drives without redundancy, i.e. logical drives in critical (degraded) or offline (failed) state.
- ▶ In addition to keeping the data consistent in the array, the Make Data Consistent also automatically corrects any media errors on the hard disks.
- ▶ Make Data Consistent can be performed simultaneously for several logical drives.

To perform the Make Data Consistent, follow the procedure below.

- 1** Start ServerView RAID Manager and log in with Administrator privileges.
→ "4.5 Starting and Exiting ServerView RAID Manager" (pg.72)
- 2** In the tree view, select a logical drive () where the Make Data Consistent is to be performed, right-click, and then click [Start MDC] from the displayed menu.

A confirmation window appears.



- 3** Click [Yes].

When the Make Data Consistent is started, [MDC running] appears in [Activity] of the object window and the progress of the Make Data Consistent is displayed. When the progress bar reaches 100% and the window closes, the check is completed.

4.8.4 Rebuild

Rebuild is the operation to recover a logical drive in critical (degraded) state to online (operational) state. For details about the rebuild, see "1.3.2 Rebuild" (→pg.18).

To execute a manual rebuild, follow the procedure below.



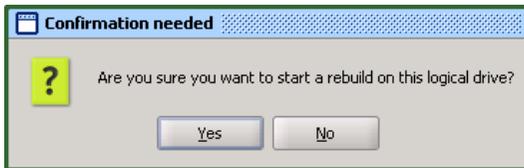
- ▶ For a hard disk failure, see "5.3 How to Replace Hard Disk" (→pg.119) and follow the procedure.
- ▶ During the rebuild, the I/O performance of the server decreases about 50% at maximum.
- ▶ It may take a few days to complete rebuild depending on the process of the server, the operating time, and the capacity of the hard disk. For details, see "1.3.2 Rebuild" (→pg.18).

1 Start ServerView RAID Manager and log in with Administrator privileges.

→"4.5 Starting and Exiting ServerView RAID Manager" (pg.72)

2 In the tree view, select a logical drive in degraded state (), right-click, and then click [Start rebuild] from the displayed menu.

A confirmation window appears.



3 Click [Yes].

When the rebuild is started, [Rebuilding] appears in [Activity] of the object window and the progress of the rebuild is displayed. When the progress bar reaches 100% and the window closes, the check is completed.

4.9 Checking each Status [ServerView RAID Manager]

The following information can be checked using ServerView RAID Manager.

- Information about events or errors that have occurred.
→"Appendix A List of ServerView RAID Event Logs" (pg.128)
- Server information.→"4.9.1 Checking Server Condition" (pg.97)
- Array configuration or controller information.
→"4.9.2 Checking Array Controller Status" (pg.98)
- Hard disk information.→"4.9.3 Checking Hard Disk Status" (pg.100)
- Logical drive information.→"4.9.4 Checking Logical Drive Status" (pg.102)
- Information about tasks running in the background.
→"4.9.5 Checking Progress of Background Tasks" (pg.104)

4.9.1 Checking Server Condition

To view information about the server installed ServerView RAID, select the server name displayed on the top of the tree view.

- 1** Start ServerView RAID Manager and log in.
→"4.5 Starting and Exiting ServerView RAID Manager" (pg.72)
- 2** Click the name of the server you want to check in the tree view.
Detailed information about the selected server is displayed.

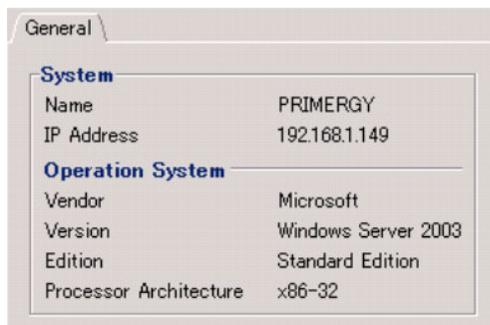


table: Detailed information about server

Item	Category	Description
System	Name	Server name.
	IP Address	Server IP address. The loopback address (127.0.0.1) may be displayed depending on the server network settings.
	Fully Qualified Domain Name	Server FQDN.

table: Detailed information about server

Item	Category	Description
Operation System	Vendor	OS vendor name.
	Version	OS type and version.
	Edition	OS edition.
	Service pack	Service pack applied to OS.
	Processor architecture	CPU type of OS.

[Note]: All items may not be displayed depending on the OS type or settings.

4.9.2 Checking Array Controller Status

Selecting the array controller in the tree view displays detailed information about the array controller in the object window.

- 1** Start ServerView RAID Manager and log in.
→"4.5 Starting and Exiting ServerView RAID Manager" (pg.72)
- 2** Click the array controller () you want to check in the tree view.
Detailed information about the selected array controller is displayed in the [General] tab.



table: Detailed information about array controller

Item	Category	Description
Adapter	Name	Model name of the array controller. The number in parentheses indicates the array controller number.
	ID	Number of the array controller.
	Vendor	Vendor name of the array controller.
	Product	Product name of the array controller.
	Chipset	Controller chip name of the array controller.
	Driver name	Driver name of the array controller.
	Driver version	Version number of the array controller's driver.
PCI Location	Bus	Bus number for the array controller.
	Function	Function number for the array controller.
	Device	Device number for the array controller.
Ports	Number	The number of ports on the array controller.
	Protocol	Protocol supported by the array controller.
Devices(max)	Physical	Logical maximum number of physical devices.
	Logical	Logical maximum number of logical devices.
Properties	Alarm present	Indication whether the alarm is present or not.
	Inconsistency handling	Action when logical drive inconsistency is detected.
	Correctable errors	The number of correctable errors the array controller detected.
	Uncorrectable errors	The number of uncorrectable errors the array controller detected.
Status		Current status of the array controller is displayed. →"● Array controller" (pg.81)
Additional Status		Additional information when there is failure (not indicating OK) on logical drives under the array controller.
Misc. properties	SAS	SAS address of the array controller.
	Coercion mode	Round unit of the capacity when creating a logical drive.

POINT

- ▶ Regarding the information displayed in the [Settings] tab, see "4.7.1 Viewing and Changing Array Controller Settings" (→pg.84).
- ▶ The [Background activities] tab is displayed if a background task is running.
Regarding the information displayed in the [Background activities] tab, see "■ Checking using Background activities from the array controller" (→pg.105).

4.9.3 Checking Hard Disk Status

Detailed information about hard disks connected to the controller is displayed in the object window.

- 1** Start ServerView RAID Manager and log in.
→ "4.5 Starting and Exiting ServerView RAID Manager" (pg.72)
- 2** Click the hard disk () you want to check in the tree view.
Detailed information about the selected hard disk is displayed.
- 3** Click the tab you want to check in the object window.

When you select the [General] tab:

Detailed information about the hard disk is displayed.

Disk	
Name	SEAGATE ST3160815AS (0)
Device number	0
Slot	0
Vendor	SEAGATE
Product	ST3160815AS
Type	SATA
Serial number	5RX01S9B
Firmware version	3AA
Transfer speed	300 [MB/s]
Transfer width	1 [bit(s)]
<hr/>	
Physical size	152627 [MB]
Config. size	151634 [MB]
<hr/>	
Misc errors	0
S.M.A.R.T. errors	0
Media errors	0
Activity	Idle
Status	Operational

table: Detailed information about hard disk

Item	Category	Description
Disk	Name	Hard disk model name. The number in parentheses indicates the location (channel and target ID) of the hard disk.
	Device number	Hard disk device number.
	Slot	Port number where the hard disk is installed.
	Vendor	Hard disk vendor name.
	Product	Hard disk product name.
	Type	Protocol type of the hard disk.
	Serial number	Serial number of the hard disk.
	Firmware version	Version number of the hard disk's firmware.
	Transfer speed	Current data transfer speed of the hard disk.
	Transfer width	Data transfer width of the hard disk.
	Physical size	Physical capacity of the hard disk.
	Config. size	Hard disk's available capacity when connected to the array controller.
	Misc errors	The number of errors detected in hard disks that are not categorized. This is reset to "0 (zero)" when restarting the system.
	S.M.A.R.T. errors	The number of errors detected in hard disks that are predicted to fail. This is reset to "0 (zero)" when restarting the system.
	Media errors	The number of media errors detected in hard disks. This is reset to "0 (zero)" when restarting the system.
	Activity	Currently running tasks in a logical drive. When background tasks are running, progress bars are displayed showing the currently running tasks and their pace. →"4.9.5 Checking Progress of Background Tasks" (pg.104)
Estimated time remaining	Displayed only when the background task is running. →"4.9.5 Checking Progress of Background Tasks" (pg.104).	
Status	Current status of the hard disk.	

When you select the [Layout] tab:

The hard disk usage is displayed.

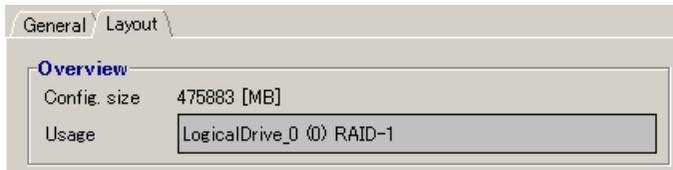


table: Hard disk usage

Category	Description
Config.size	Available hard disk space.
Usage	Name, number, and RAID level of a logical drive that the hard disk belongs to.

4.9.4 Checking Logical Drive Status

Detailed information about logical drives is displayed in the object window.

You can change the displayed information by switching the tabs at the top of the object window.

- 1 Start ServerView RAID Manager and log in.

→"4.5 Starting and Exiting ServerView RAID Manager" (pg.72)

- 2 In the tree view, click the logical drive you want to browse ().

Detailed information about the selected logical drive is displayed in the object window.

- 3 Click the tab you want to check in the object window.

When you select the [General] tab:



table: Detailed information about logical drive

Item	Category	Description
Logical Drive	Name	Logical drive name.
	Logical drive number	Logical drive number.
	RAID level	RAID level set for the logical drive.
	Stripe size	Striping size used by the logical drive.
	Logical size	Logical size of the logical drive.
	Physical size	Physical size of the logical drive.
	Initialization status	Initialized status of the logical drive. When Initialize, Make Data Consistent, and Rebuild are completed, this indicates "Initialized".
	Activity	Running tasks for the logical drive. When background tasks are running, the running tasks and their progress are displayed with a progress bar. →"4.9.5 Checking Progress of Background Tasks" (pg.104).
	Estimated time remaining	Displayed only when background tasks are running. →"4.9.5 Checking Progress of Background Tasks" (pg.104).
Status	Current status of the logical drive.	
Cache	Read mode	Settings for read-ahead cache of the hard disks under the logical drive.
	Disk cache mode	Settings for write cache of the hard disks under the logical drive.
Misc. properties	Operating system device name	Logical drive device name.

When you select the [Layout] tab:

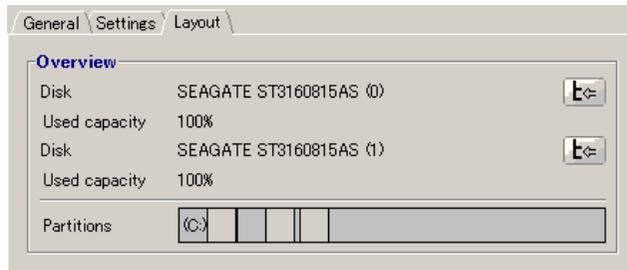


table: Logical drive layout information

Category	Description
Disk	Hard disks that compose the target logical drive.
Used capacity	Capacity of hard disks used by the target logical drive.

4.9.5 Checking Progress of Background Tasks

There are two background tasks: rebuild and Make Data Consistent. ServerView RAID Manager enables you to view the progress of these tasks with progress bars.

From the pace of the progress bar, you can figure out approximately how long the task will take from start to finish.

The background tasks for which the progress can be checked are as follows:

table: Background tasks

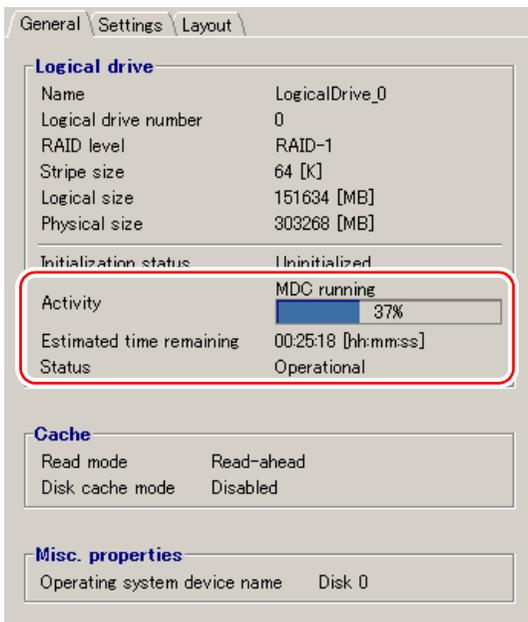
Background task	Activities	How to check background tasks
Make Data Consistent	MDC running	<ul style="list-style-type: none"> • Checking using detailed information about logical drives • Checking using Background activities from the array controller • Checking using detailed information about hard disks (rebuild only)
Rebuild	Rebuilding	

■ Checking using detailed information about logical drives

With this method, you can check the background tasks being executed on the selected logical drive.

- 1 Start ServerView RAID Manager and log in.
→"4.5 Starting and Exiting ServerView RAID Manager" (pg.72)
- 2 In the tree view, click the logical drive ().
- 3 Click the [General] tab.

You can check the type and progress of the background tasks being executed in [Activity].



POINT

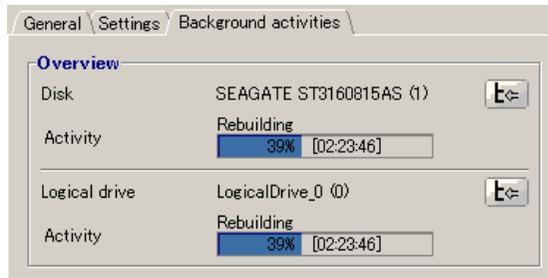
- ▶ The approximate time to complete the background task is displayed in [Estimated time remaining]. However, use this time only as a guideline since the actual time may be different depending on the system load.

■ Checking using Background activities from the array controller

With this method, you can check all the background tasks being executed in the selected array controller.

- 1** Start ServerView RAID Manager and log in.
→ "4.5 Starting and Exiting ServerView RAID Manager" (pg.72)
- 2** In the tree view, click the controller ().
- 3** Click the [Background activities] tab.

The logical drives where background tasks are currently being executed are displayed in [Logical Drive], and you can check the type and progress of the background tasks being executed in [Activity].



POINT

- ▶ When you click the button () to the right of the information for each logical drive, the target logical drive is selected in the tree view, so that you can view detailed information about that logical drive.
- ▶ While a rebuild is in progress, both the progress for the logical drive and the progress for the hard disk are displayed.
- ▶ The approximate time to complete the background task is displayed in [Activity]. However, use this time only as a guideline since the actual time may be different depending on the system load.

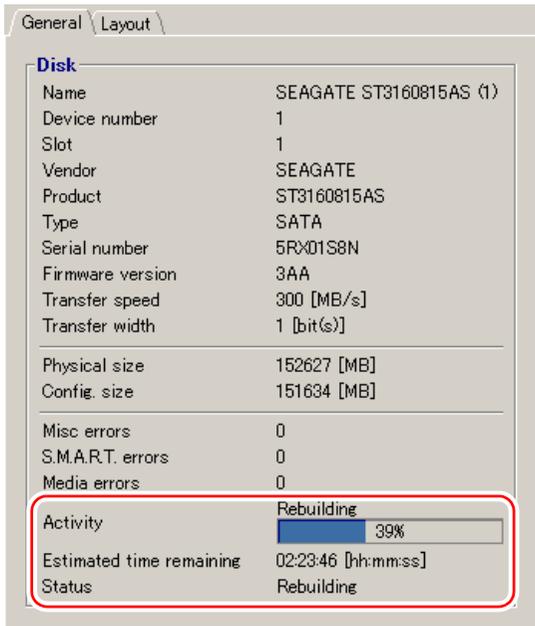
■ Checking using detailed information about hard disks (Rebuild only)

With this method, you can check the rebuilds being executed on the selected hard disk.

- 1** Start ServerView RAID Manager and log in.
→ "4.5 Starting and Exiting ServerView RAID Manager" (pg.72)
- 2** In the tree view, click the hard disk being rebuilt ().

3 Click the [General] tab.

You can check the progress of the rebuild being executed in [Activity].



POINT

- ▶ The approximate time to complete the background task is displayed in [Estimated time remaining]. However, use this time only as a guideline since the actual time may be different depending on the system load.

■ Displaying the approximate time needed for a background task

For on-going background tasks, approximate time that the task will take from start to finish is displayed in the progress bar.

POINT

- ▶ Use the displayed time only as a guideline since this time is calculated roughly from the task progress. The actual time may be different from the displayed time depending on the system load changes and other factors.

Chapter 5

Replacing Hard Disk

This chapter explains maintenance related issues, such as hard disk replacement.

5.1	Displaying Failed Condition on POST Message	108
5.2	Checking Target Hard Disk to Be Replaced	114
5.3	How to Replace Hard Disk	119

5.1 Displaying Failed Condition on POST Message

This section explains about messages displayed at Power On Self Test (POST) and error handling.

5.1.1 Message and Error Handling

POST runs at the array controller initialization right after power is turned on. When POST detects an error in a hard disk or logical drive, a message appears and the array controller may halt waiting for key-in depending on the status.

Take a necessary measure as follows according to the displayed message.

Description	Controller information
Message	LSI MegaRAID Software RAID BIOS Version A.0.xxxxxxxxR LSI SATA RAID Found at PCI Bus No:xx Dev No:xx
Meaning	This displays the array controller expansion ROM BIOS version and the device information.
Action	None

Description	Hard disk information
Message	Device present at port 0 XXXXXXXXXXXXXXXXXXXX XXXXXXMB Device present at port 1 XXXXXXXXXXXXXXXXXXXX XXXXXXMB
Meaning	This displays the model name and the capacity of the hard disks connected to each port. The line, "Device present at port X" is displayed only when the ports connected to hard disks are detected.
Action	When hard disks are not displayed although they are installed, take a necessary measure according to the following message.

Description	Logical drive information
Message	XX Virtual drive(s) Configured. <pre>Array# Mode Stripe Size No Of Stripes DriveSize Status 00 RAID X 64KB 02 XXXXXXMB Online</pre>
Meaning	This displays the number of the logical drives detected and their information. "Online", "Degraded", or "Offline" is displayed on [Status]. When "Degraded" or "Offline" is displayed, POST halts waiting for key-in.
Action	When there is "Degraded" logical drive <ol style="list-style-type: none"> 1. Check the installation location of the failed hard disk. →"5.2 Checking Target Hard Disk to Be Replaced" (pg.114) 2. Start up SATA Setup Utility. And follow the procedure of "2.3 Displaying Logical Drive/ Hard Disk Information" (→pg.41) to check if the location of the hard disk indicating "FAIL" and the hard disk you checked in step 1 are the same. When they are the same, do one of the following: (1) Press the [Enter] key or any other key than the [Ctrl] + [M] keys to start OS. (2) Perform rebuild following the procedure of "5.3 How to Replace Hard Disk" (→pg.119). 3. If the locations are different, contact an office listed in the "Contact Information" of "Start Guide". See also "5.1.2 Inconsistent Configuration Information" (→pg.112). When there is "Offline" logical drive Contact an office listed in the "Contact Information" of "Start Guide".

Description	Not detecting logical drives nor hard disks
Message	No Virtual drive(s) Configured. No Hard Disks found. LSI Software RAID can not be Configured!
Meaning	No hard disks are detected. No logical drives are configured.
Action	If this message appears although hard disks are installed, contact an office listed in the "Contact Information" of "Start Guide".

Description	Detecting a logical drive being rebuilt
Message	PORT x is Rebuilding State XX Virtual drive(s) Configured. <pre>Array# Mode Stripe Size No Of Stripes DriveSize Status 00 RAID 1 64KB 02 XXXXXXMB Degraded</pre> Press Ctrl-M or Enter to run LSI Software RAID Setup Utility. Or any other key to continue.
Meaning	The hard disk x connected to the port x is being rebuilt, and the logical drive is critical (degraded). To start up SATA Setup Utility, press the [Enter] key or the [Ctrl] + [M] keys. To pass POST, press any other key.
Action	Pass POST by pressing any key other than the [Enter] key or the [Ctrl] + [M] keys.

Description	Logical drives not responding (All hard disks under logical drives)
Message	<p>WARNING!</p> <p>Some configured disks have been removed from your system or are no longer accessible. Pls. check your cables a. ensure all disk are present. Press any key to continue. (*Press any key, and the following message appears.)</p> <p>The following VDs are missing: XX YY ZZ If you proceed or load the CU, these VDs will be removed from your config. If you wish to use them at a later time, they'll have to be imported. If you believe these VDs should be present, pls. power off your system and chk your HW config. to ensure all disks are detected. Press any key to continue.</p>
Meaning	<p>All the hard disks which compose logical drive XX, YY and ZZ are not responding. Pressing any key to continue removes the logical drive XX, YY and ZZ from the configuration.</p>
Action	<p>Contact an office listed in the "Contact Information" of "Start Guide". Configuration information of the logical drives is not changed when turning off or restarting the server while this message is displayed waiting for key-in.</p>

Description	Logical drives not responding (RAID 0)
Message	<p>WARNING!</p> <p>Some configured disks have been removed from your system or are no longer accessible. Pls. check your cables a. ensure all disk are present. Press any key to continue. (*Press any key, and the following message appears.)</p> <p>The following VDs are missing: XX If you proceed (or load the configuration utility), these VDs will be marked OFFLINE and will be inaccessible.</p> <p>Please check your cables and ensure all disks are present. Press any key to continue.</p>
Meaning	<p>Any of the hard disks configure RAID 0 logical drive XX is not responding. Pressing any key to continue makes the RAID 0 logical drive XX offline.</p> <p>Note: ▶ When RAID 0 is configured in a single hard disk which is not responding, the message of "Logical drives not responding (All the hard disks under logical drives)" appears.</p>
Action	<p>Contact an office listed in the "Contact Information" of "Start Guide". Configuration information of the logical drives is not changed when turning off or restarting the server while this message is displayed waiting for key-in.</p>

Description	Not detecting hard disks and unmatched insert locations
Message	<p>WARNING!</p> <p>BIOS detected configured disks w. some drive(s) missing, pls power off the system, remove the drive from port:XX and reinsert it in another slot.</p> <p>Press any key to continue.</p> <p>(*Press any key, and the following message appears.)</p> <p>If you proceed, you'll lose this configuration.</p> <p>Press any key to continue.</p>
Meaning	<p>The hard disk connecting to the port XX was connected to the other port at the last startup. The hard disk connecting to the port XX last time is not found.</p> <p>The configuration information will be cleared by pressing any key to continue.</p>
Action	<p>Contact an office listed in the "Contact Information" of "Start Guide".</p> <p>Configuration information of the logical drives is not changed when turning off or restarting the server while this message is displayed waiting for key-in.</p>

Description	Inconsistent time stamps of configurations
Message	<p>WARNING!</p> <p>BIOS detected configured disks w. inconsistent time stamps. BIOS will accept the config. Based on the latest time stamp contained on the Following PDs: xx yy zz</p> <p>Press any key to continue.</p> <p>(*Press any key, and the following message appears.)</p> <p>If you believe these PDs do not contain a desired config., pls. Power off the system, remove those PDs and reboot.</p> <p>Press any key to continue.</p>
Meaning	<p>Configuration information recorded in each hard disk is inconsistent.</p> <p>Pressing any key to continue applies the configuration information with the latest time stamp contained on the hard disk xx, yy, and zz.</p>
Action	<p>Check if the failed hard disk recorded in the event log or event notification e-mail has the same port number as the hard disk which is considered as having an old time stamp on this message has.</p> <p>→"5.2 Checking Target Hard Disk to Be Replaced" (pg.114)</p> <p>→"5.3.1 Replacing Failed Hard Disk (RAID 1) [ServerView RAID Manager]" (pg.119)</p> <p>When they have the same port number, press any key to restore the logical drive configuration information. And then, replace the failed hard disk and perform rebuild. See also "5.1.2 Inconsistent Configuration Information" (→pg.112).</p> <p>When they have different numbers, contact an office listed in the "Contact Information" of "Start Guide".</p>

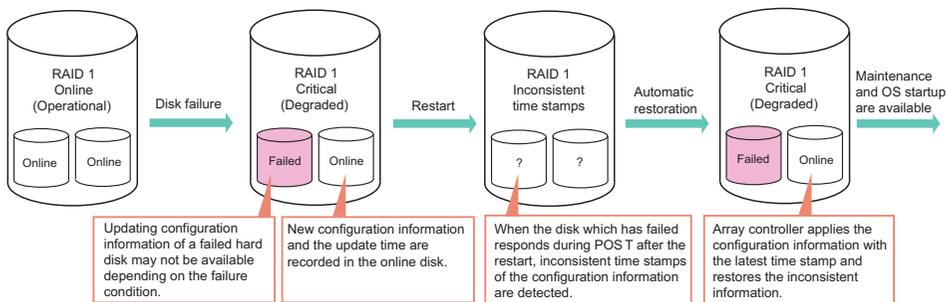
5.1.2 Inconsistent Configuration Information

This array controller records the array configuration information only in hard disks. When the information is updated, such as creating a new logical drive, changing the configuration, or a hard disk failure, the update time (time stamp) is also recorded in each hard disk.

The configuration information, recorded in each hard disk which composes a logical drive, may be inconsistent when the hard disk has been failed and disconnected at some point but responds normally after the system restart.

■ Automatic restoration by array controller

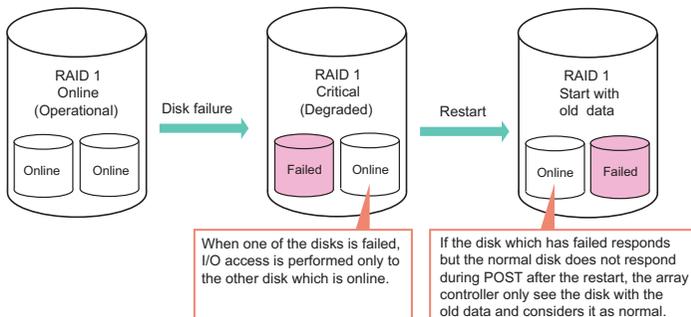
This array controller compares the configuration information recorded in each hard disk during POST process. When a hard disk which has a different time stamp to the other is detected, a message of "Inconsistent time stamps of configurations" (→pg.111) appears and the POST halts waiting for key-in. After you press any key, the hard disk with an old time stamp will be considered as failed at the last update of the configuration information, and the hard disk with the latest time stamp will be considered to have the correct information. The array controller applies the information with the latest time stamp to all other hard disks automatically.



■ Unable to identify correct configuration information

On the other hand, the array controller compares only the time stamps of hard disks which have responded during POST. For this reason, when a hard disk with correct information does not respond but the one which was failed last time responds, the array controller considers the failed one as normal. This may cause loss of data.

When only a single hard disk responds, the array controller does not compare the configuration information. That means you cannot identify from the screen at POST if the hard disk which has responded has the latest information.



Therefore, when the message of the "Hard disk failure (Logical drive in critical state)" or "Inconsistent time stamps of configurations" appears at POST to halt it, make sure the failed hard disk, which is cited on the event log recorded in the monitoring terminal, event notification e-mail, or the system event log, is the same as the hard disk which has indicated a failure (indicating not having the latest configuration information) on the screen.

If the hard disks are different, multiple hard disks or some parts other than a hard disk may have been failed. In this case, you cannot restore by using the normal maintenance procedure. Contact an office listed in the "Contact Information" of "Start Guide".

The following is an example of the screen.

● **Detecting inconsistent configuration information**

```

LSI MegaRAID Software RAID BIOS Version A.05.10121518R
LSI SATA RAID Found at PCI Bus No:00 Dev No:1F

Device present at port 0 WDC WD800JD-55MSA1 75807MB
Device present at port 1 WDC WD800JD-55MSA1 75807MB
Device present at port 2 WDC WD800JD-55MSA1 75807MB
Device present at port 3 WDC WD800JD-55MSA1 75807MB
Device present at port 4 HL-DT-STDVD-ROM GD

WARNING !
BIOS detected configured disks w. inconsistent time stamps. BIOS will
accept the config. Based on the latest time stamp contained on the
Following PDs: 00 02 03

Press any key to continue.
(*Press any key, and the following message appears.)
If you believe these PDs do not contain a desired config., pls. Power off
the system, remove those PDs and reboot.

Press any key to continue.
(*Press any key, and the following message appears.)

02 Virtual drive(s) Configured.
Array# Mode Stripe Size No.Of Stripes DriveSize Status
00 RAID 1 64KB 02 75340MB Degraded
01 RAID 1 64KB 02 75340MB Online
Press Ctrl-M or Enter to run LSI Software RAID Setup Utility.
Or any other key to continue.
    
```

Hard disks are connected to the port 0, 1, 2, and 3. Although CD/DVD drive is connected to the port 4, it cannot be processed on this screen.

Hard disks connected to the port 0, 2, and 3 contain configuration information with the latest update time stamps. The hard disk connected to the port 1 which is not displayed here contains the information with the old time stamp.

If the power is turned off at this point, the configuration information will not be restored automatically.

Restoring configuration information, with the result that one of the hard disks is degraded. In this state, you can run OS or replace hard disks.

● **Unable to identify correct configuration information**

```

LSI MegaRAID Software RAID BIOS Version A.05.10121518R
LSI SATA RAID Found at PCI Bus No:00 Dev No:1F

Device present at port 0 WDC WD800JD-55MSA1 75807MB
Device present at port 4 HL-DT-STDVD-ROM GD

01 Virtual drive(s) Configured.
Array# Mode Stripe Size No.Of Stripes DriveSize Status
00 RAID 1 64KB 02 75340MB Degraded
Press Ctrl-M or Enter to run LSI Software RAID Setup Utility.
Or any other key to continue.
    
```

A hard disk is only connected to the port 0. If hard disks connected to other ports do not respond, they are not displayed here even if they actually are connected.

The logical drive is in degraded. After checking event logs, you can locate the target hard disk drive to be replaced.

5.2 Checking Target Hard Disk to Be Replaced

This section explains how to locate a target hard disk to be replaced when you replace a hard disk.

There are four methods to check as follows:

- Using ServerView RAID Manager
→"5.2.1 Checking with ServerView RAID Manager" (pg.114)
- Using the system event log
→"5.2.2 Checking with System Event Log" (pg.115)
- Using event logs
→"5.2.3 Checking with Event Logs" (pg.117)
- Using e-mail
→"5.2.4 Checking with E-mail" (pg.118)

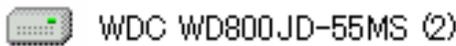
5.2.1 Checking with ServerView RAID Manager

- 1** Start ServerView RAID Manager and log in.
→"4.5 Starting and Exiting ServerView RAID Manager" (pg.72)

- 2** Check the hard disk icon in the tree view.

The failed hard disk is marked with the  icon.

You can see the port number on the icon as follows:



Port number. It is "2" in this instance.

IMPORTANT

- ▶ If there is any hard disk being rebuilt (marked with ) , wait until the rebuild is completed. After it has completed, check the hard disk status again.

- 3** For the details, select the [General] tab in the Object window.
You can view the selected hard disk information.

POINT

- ▶ The detailed information may not be available depending on the failed hard disk condition.

- 4** If there is a failed hard disk or a hard disk that is predicted to fail, replace it as follows:

If there is a failed hard disk

See "5.3 How to Replace Hard Disk" (→pg.119) to replace the failed hard disk.

If there is a hard disk that is predicted to fail

See "5.3 How to Replace Hard Disk" (→pg.119) to replace the hard disk with a failure prediction warning.



When a hard disk failed and another is predicted to fail

- ▶ First, replace the failed hard disk and perform rebuild. After that, make sure that the failure indication of the replaced hard disk has disappeared, i.e. that the logical drive is operational, and then replace the hard disk that is predicted to fail, as a preventive measure.
If the hard disk that is predicted to fail is replaced before replacing the failed disk, rebuild cannot be performed and data will be lost.

5.2.2 Checking with System Event Log

This section explains how to check a target hard disk using the system event log recorded on the server. Use this procedure when ServerView RAID Manager is not available. For the overview, see "4.2.3 Hard Disk Failure Notification to System Event Log" (→pg.62).

On the server supports the system event log, ServerView Agents records a hard disk status in the system event log when detecting the status change while it is running. In the same way, when detecting a hard disk other than online (operational) at the system startup, the status is recorded in the system event log.



- ▶ When there is a failed or rebuilding hard disk, the event is recorded every system startup.

The following is a list of events to check the target hard disk to be replaced.

POINT

- ▶ Messages are different depending on the method to check the system event log.
 Examples on BIOS Setup Utility of the server are described as "BIOS".
 Examples of using Remote Management Controller are described as "iRMC2".
- ▶ On this array controller, the same value as the port number is displayed in "Y" which indicates the device number.
 →"4.9.3 Checking Hard Disk Status" (pg.100)

Message (BIOS)	SATA(0:X:Y) failed
Message (iRMC2)	SATA HD on Ctrl.0 Port X Dev. Y failed
Meaning	Hard disk (X) is failed.
Note	This may also be logged when installing a new hard disk at the hard disk replacement.

Message (BIOS)	SATA(0:X:Y) dead
Message (iRMC2)	SATA HD on Ctrl.0 Port X Dev. Y dead
Meaning	Hard disk (X) is failed (missing).
Note	This may also be logged when removing a failed hard disk at the hard disk replacement.

Message (BIOS)	SATA(0:X:Y) offline
Message (iRMC2)	SATA HD on Ctrl.0 Port X Dev. Y offline
Meaning	Hard disk (X) is offline.

Message (BIOS)	SATA(0:X:Y) rebuild
Message (iRMC2)	SATA HD on Ctrl.0 Port X Dev. Y rebuilding
Meaning	Hard disk (X) is being rebuilt.

Message (BIOS)	SATA(0:X:Y) online
Message (iRMC2)	SATA HD on Ctrl.0 Port X Dev. Y online
Meaning	Hard disk (X) is online (operational).
Note	This is logged when rebuild is completed.

5.2.3 Checking with Event Logs

This section explains how to check a target hard disk using event logs recorded in a monitoring terminal.

Use this procedure when ServerView RAID Manager is not available. For more information, see "■ Interaction with ServerView AlarmService" (→pg.61).

The following messages are the events recorded in the OS event log with ServerView AlarmService (Source: Fujitsu ServerView Services). They can be used for checking a target hard disk to be replaced.

The (X) is the port number of the connected hard disk.

For details of events, see "Appendix A List of ServerView RAID Event Logs" (→pg.128).

Message	Adapter LSI Logic Embedded MegaRAID: Disk (X) missing after reboot
Meaning	Hard disk (X) which was connected the last time is missing.

Message	Adapter LSI Logic Embedded MegaRAID: Logical drive X operational
Meaning	Logical drive (X) has completed rebuild.

Message	Adapter LSI Logic Embedded MegaRAID: State change on Disk (X) from offline to failed
Meaning	Hard disk (X) has changed from offline to failed.

Message	Adapter LSI Logic Embedded MegaRAID: State change on logical drive (X) from operational to failed
Meaning	Logical drive (X) has changed from online (operational) to failed.

Message	Adapter LSI Logic Embedded MegaRAID: State change on Disk (X) from operational to failed
Meaning	Hard disk (X) has changed from online (operational) to failed.

Message	Adapter LSI Logic Embedded MegaRAID: State change on Disk (X) from operational to offline
Meaning	Hard disk (X) has changed from online (operational) to offline.

Message	Adapter LSI Logic Embedded MegaRAID: State change on Disk (X) from rebuilding to failed
Meaning	Hard disk (X) has changed from rebuilding to failed.

Message	Adapter LSI Logic Embedded MegaRAID: State change on Disk (X) from rebuilding to offline
Meaning	Hard disk (X) has changed from rebuilding to offline.

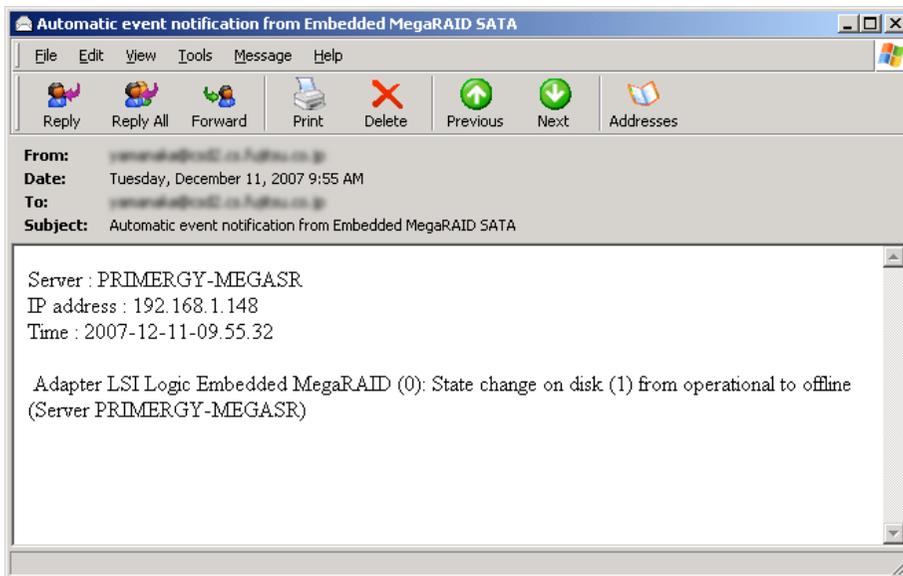
Message	Adapter LSI Logic Embedded MegaRAID: State change on Disk (X) from rebuilding to operational
Meaning	Hard disk (X) has changed from rebuilding to online (operational).

5.2.4 Checking with E-mail

This section explains how to check a target hard disk using e-mail sent by ServerView AlarmService. Use this procedure when ServerView RAID Manager is not available.

→"4.2.2 Hard Disk Failure Notification via E-mail" (pg.61)

Using e-mail notifications for hard disk failures, such e-mail as shown below will be sent at a hard disk failure.



The e-mail above notifies you a failure that the hard disk (1) which was online the last time has changed to offline. The information in the e-mail is same as what recorded in OS event log with ServerView AlarmService.

For details of events, see "Appendix A List of ServerView RAID Event Logs" (→pg.128).

5.3 How to Replace Hard Disk

This section explains how to replace a hard disk.

IMPORTANT

- ▶ POST may halt displaying WARNING when the system is turned on depending on the failed hard disk condition.
 - "5.1 Displaying Failed Condition on POST Message" (pg.108)
 - In this case, after taking a necessary measure described in "5.1.1 Message and Error Handling" (→pg.108), follow the procedure below to replace the hard disk.

5.3.1 Replacing Failed Hard Disk (RAID 1) [ServerView RAID Manager]

If a hard disk fails on the redundant RAID level (RAID 1), it must be replaced with a new one as soon as possible and the logical drive must be rebuilt. The procedure to rebuild on ServerView RAID Manager is as follows:

IMPORTANT

- ▶ Replace the failed hard disk with a new one of the same model (with the same capacity and speed) as a rule.
- 1** Check the disk number of the failed hard disk and locate the disk.
 - "5.2 Checking Target Hard Disk to Be Replaced" (pg.114)
 - 2** Start ServerView RAID Manager and log in with Administrator privileges.
 - "4.5 Starting and Exiting ServerView RAID Manager" (pg.72)
 - 3** Remove the failed hard disk and install the new one.

POINT

- ▶ For how to remove and install hard disks, see the "User's Guide" on the PRIMERGY Startup Disc supplied with the server.
- 4** Make sure the installed hard disk is in failed state ().
And continue the procedure from step 5.

IMPORTANT

- ▶ Although a new hard disk is installed, it may be displayed as failed (missing) state () and not be recognized depending on the failed condition. In this case, the hard disk will be recognized when rebooting the system with the new hard disk installed. If it does not be recognized after the reboot, contact an office listed in the "Contact Information" of "Start Guide"

- 5** In the tree view, select the logical drive in degraded state (), right-click, and then click [Start rebuild] from the displayed menu.

The confirmation window appears.



- 6** Click [Yes].

When the rebuild is started, [Rebuilding] appears in [Activity] on the object window and the progress of the rebuild is displayed. When the progress bar reaches 100% and the window closes, the check is completed.

POINT

- ▶ When the rebuild is completed, the following event is recorded in the OS event log or in the Event Window of the ServerView RAID Manager.
→"4.2.5 Monitoring Event Log" (pg.63)

```
Event ID: 10082
Event Description: Adapter LSI Logic Embedded MegaRAID (0): Logical
drive x operational
```

5.3.2 Replacing Failed Hard Disk (RAID 1) [SATA Setup Utility]

For how to rebuild with SATA Setup Utility, see "2.4 Rebuilding Logical Drive" (→pg.43).

Also check a target hard disk to be replaced with the procedure of "5.2 Checking Target Hard Disk to Be Replaced" (→pg.114) in advance.

POINT

- ▶ If the system restarts during the rebuild with SATA Setup Utility, the rebuild is resumed from where it was stopped the next time.
- ▶ When the rebuild is completed, the following event is recorded in the OS event log.
→"4.2.5 Monitoring Event Log" (pg.63)

```
Event ID: 10082
Event Description: Adapter LSI Logic Embedded MegaRAID (0): Logical
drive x operational
```

5.3.3 Replacing Failed Hard Disk (RAID 0) [SATA Setup Utility]

When a hard disk under the RAID 0 logical drive is failed, replace the hard disk and restore the logical drive with SATA Setup Utility.

IMPORTANT

- ▶ When a hard disk under the RAID 0 logical drive is failed, the data in the logical drive is lost and cannot be recovered.
→ "1.2.3 RAID Levels" (pg.13)
- ▶ When all hard disks under the RAID 0 logical drive are not responding, the logical drive will be deleted passing POST.
→ "Logical drives not responding (All hard disks under logical drives)" (pg.110) in "5.1.1 Message and Error Handling" (→pg.108).
Especially when RAID 0 is consisted of a single hard disk and the disk fails without responding, you cannot start SATA Setup Utility keeping the logical drive configuration. Therefore you cannot restore with the following procedure. In this case, delete all array configurations and reconfigure them.

1 Check the disk number and the location of the failed hard disk.

→ "5.2 Checking Target Hard Disk to Be Replaced" (pg.114)

2 Start up SATA Setup Utility.

→ "2.1.1 Starting and Exiting SATA Setup Utility" (pg.24)

3 Select [Objects] from the Management Menu, and press the [Enter] key.

4 Select [Physical Drive] from Objects, and press the [Enter] key.

The [Objects - PHYSICAL DRIVES SELECTION MENU] screen appears.

5 Check that the target hard disk in step 1 is "FAIL" and its logical drive number.

POINT

- ▶ "XX" on "FAIL AXX-YY" indicates the logical drive number.

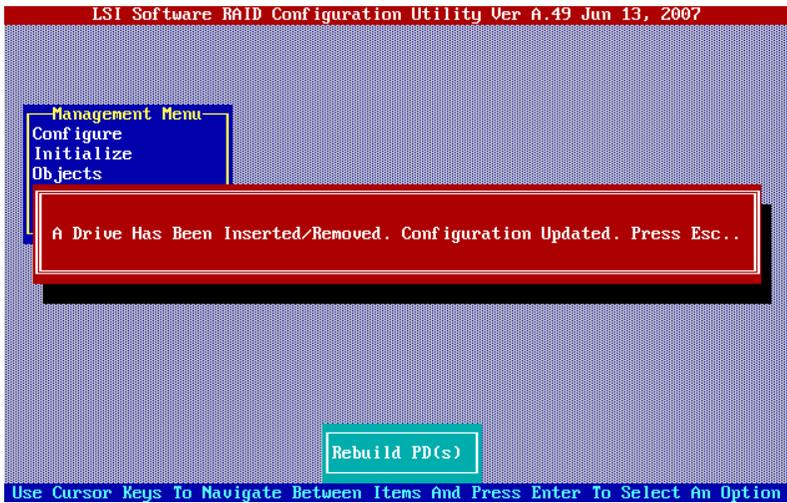
6 Replace the target hard disk connected to the port indicating "FAIL" with a new one.

POINT

- ▶ For the port number displayed, the actual installation location, and how to remove and install a hard disk, see the "User's Guide" on the PRIMERGY Startup Disc supplied with the server.

Using the server supporting hot swap

The following screen appears when removing/installing a hard disk is detected. Press the [Esc] key to return to the Management Menu.



Using the server not supporting hot swap

Turn off the power and replace the hard disk. After the reboot, display the [Objects - PHYSICAL DRIVES SELECTION MENU] screen taking step 1 to 4. Then skip to step 9.

- 7** Select [Objects] again from the Management Menu, and press the [Enter] key.
- 8** Select [Physical Drive] again from Objects, and press the [Enter] key.
The [Objects - PHYSICAL DRIVES SELECTION MENU] screen appears.
- 9** Select the replaced hard disk, and press the [Enter] key.
- 10** Select [Force Online], and press the [Enter] key.
The message "Change To Online?" appears.
- 11** Select [Yes], and press the [Enter] key.
The hard disk status changes to "ONLINE".
- 12** Press the [Esc] key three times.
It takes you back to the Management Menu.
- 13** Select [Initialize] from the Management Menu, and press the [Enter] key.
- 14** Select the logical drive of which hard disk has been replaced from the [Logical Drive] menu, and press the [Space] key.
The logical drive name is highlighted.
- 15** Press the [F10] key.

16 Select [Yes], and press the [Enter] key.

At the initialize settings, Fast Initialization starts and will be completed in a few to several tens of seconds. When it is completed, "VD X Initialization Complete. Press Esc.." will appear on the screen.

17 The logical drive has been restored. Press the [Esc] key twice.

It takes you back to the Management Menu.

18 Restore the backup data for the logical drive which was restored.

5.3.4 Preventive Replacement of Hard Disk [ServerView RAID Manager]

When the hard disk failure prediction function (PFA/S.M.A.R.T.) reports S.M.A.R.T. errors, it means that the hard disk may fail in the near future. If the hard disk status indicates S.M.A.R.T. errors, replace the disk as a preventive measure.

POINT

- ▶ For how to remove and install hard disks, see the "User's Guide" on the PRIMERGY Startup Disc supplied with the server.

IMPORTANT

- ▶ Replace the hard disk predicted to fail with a new one of the same model (with the same capacity and speed) as a rule.
- ▶ We recommend that you back up the data before a preventive replacement of a hard disk.
- ▶ When two or more hard disks are predicted to fail, replace one drive at a time.
- ▶ If any hard disk has already failed, replace the disk first referring to "5.3 How to Replace Hard Disk" (→pg.119). If any hard disk is being rebuilt, wait until the rebuild process is finished.

1 Check event logs and make sure that Make Data Consistent has been completed within a week and potential media errors have been corrected.

→"4.4.3 Checking HDD Check Scheduler" (pg.70)

If no log indicates that Make Data Consistent has completed, perform Make Data Consistent.

→"4.8.3 Make Data Consistent" (pg.95)

2 Start ServerView RAID Manager and log in with Administrator privileges.

→"4.5 Starting and Exiting ServerView RAID Manager" (pg.72)

3 In the tree view, select the hard disk predicted to fail ().

IMPORTANT

- ▶ This product takes approximately 20 minutes to start monitoring a failure prediction after the system startup. Ensure that no hard disk is predicted to fail for the 20 minutes after the system startup.

- 4** In the tree view, select the target hard disk, right-click, and then click [Make Offline] from the displayed menu.

The following message appears.

Are you sure you want to set this physical disk to offline?

- 5** Enter "yes" and click [OK].
- 6** Check the [Status] field for the target hard disk has changed to "Failed" in the object window.

POINT

- ▶ If you change a hard disk other than the one to be replaced to [Make Offline], continue to replace the hard disk as a preventive measure and complete rebuilding. Then, replace the target hard disk.

- 7** Replace the offline hard disks and perform rebuild.

→"5.3.1 Replacing Failed Hard Disk (RAID 1) [ServerView RAID Manager]" (pg.119)

→"5.3.2 Replacing Failed Hard Disk (RAID 1) [SATA Setup Utility]" (pg.120)

5.3.5 Preventive Replacement of Hard Disk (RAID 0) [SATA Setup Utility]

When the hard disk failure prediction function (PFA/S.M.A.R.T.) reports S.M.A.R.T. errors, it means that the hard disk may fail in the near future. If the hard disk status indicates S.M.A.R.T. errors, replace the disk as a preventive measure.

POINT

- ▶ For how to remove and install hard disks, see the "User's Guide" on the PRIMERGY Startup Disc supplied with the server.

IMPORTANT

- ▶ Replace the hard disk predicted to fail with a new one of the same model (with the same capacity and speed) as a rule.

- 1** Start ServerView RAID Manager and log in with Administrator privileges.

→"4.5 Starting and Exiting ServerView RAID Manager" (pg.72)

- 2** In the tree view, check the location of the hard disk predicted to fail () and its logical drive number.

IMPORTANT

- ▶ It takes 20 minutes to start monitoring a failure prediction after the system startup. Ensure that no hard disk is predicted to fail for the 20 minutes after the system startup.

- 3** Make a full backup of the data on the logical drive.

- 4** Restart the system, and start up SATA Setup Utility.
→"2.1.1 Starting and Exiting SATA Setup Utility" (pg.24)
- 5** Select [Objects] from Management Menu, and press the [Enter] key.
- 6** Select [Physical Drive] from Objects, and press the [Enter] key.
The [Objects - PHYSICAL DRIVES SELECTION MENU] screen appears.
- 7** Select the target hard disk checked in step 2, and press the [Enter] key.
- 8** Select [Force Offline], and press the [Enter] key.
The message "Fail The Drive Or Change To Ready?" appears.
- 9** Select [Yes], and press the [Enter] key.
The hard disk status changes to "FAIL".
- 10** Press the [Esc] key three times.
It takes you back to the Management Menu.
- 11** Replace the hard disks marked "FAIL", and restore the backup data.
→"5.3.3 Replacing Failed Hard Disk (RAID 0) [SATA Setup Utility]" (pg.121)

Appendix

This section describes the ServerView RAID event logs and how to set e-mail notifications for a hard disk failure.

A	List of ServerView RAID Event Logs	128
B	Setting E-mail Notification for Hard Disk Failure	145

A List of ServerView RAID Event Logs

This section explains about logs recorded in OS event logs.

Two kinds of logs recorded in OS event logs are used for monitoring: logs ServerView RAID service directly records on OS event logs, and logs ServerView RAID service sends to ServerView AlarmService.

→"4.2.5 Monitoring Event Log" (pg.63)

These two logs record the same event, but the event format is different as follows.

● For Windows

table: Log that ServerView RAID service directly records on OS event log

Item	Description
Source	ServerView RAID
Date	Date the event occurred
Time	Time the event occurred
Type	Severity level of the event
User	Not used
Computer	Name of the host where the event occurred
Category	Not used
Event ID	Event ID
Description	Adapter LSI Logic Embedded MegaRAID (0): <i>[Brief description of an event]</i>

table: Log that ServerView RAID service sends to ServerView AlarmService

Item	Description
Source	Fujitsu ServerView Services
Date	Date the event occurred
Time	Time the event occurred
Type	Severity level of the event
User	Not used
Computer	Name of the host where the event occurred
Category	Not used
Event ID	Not used
Description	ServerView received the following alarm from server <i>[Host name]</i> : Adapter LSI Logic Embedded MegaRAID (0): <i>[Brief description of an event]</i> (Server <i>[Host name]</i>)

● **For Linux**

- Logs ServerView RAID service directly records on OS event logs

```
[Date] [Time] [Host name] ServerView RAID: [[Event ID]][[Severity level]]
Adapter LSI Logic Embedded MegaRAID(0):[Brief description of an event]
```

- Logs ServerView RAID service sends to ServerView AlarmService

```
[Date] [Time] [Host name] FSC ServerView Services[PID]: ([Severity level])
ServerView received the following alarm from server [Host name]:Adapter
LSI Logic Embedded MegaRAID(0): [Brief description of an event] (Server
[Host name])
```

The log also records the location of the device. Types of locations are as follows:

table: Meaning of event log string

Character String [Note 1]	Meaning
Server %s	Name of the server
Adapter %s	Type and number of the controller For this array controller, the name is "LSI Logic Embedded MegaRAID"
Disk %s	Number of the hard disk (x) is displayed. "x" indicates the hard disk number.
Logical Drive %s	Number of the logical drive

[Note 1]: %s is replaced with a number or a character string.



- ▶ Unless ServerView is installed, logging through a ServerView AlarmService is not available. See the "User's Guide" located on the "PRIMERGY Startup Disc" supplied with the server to install and configure ServerView.

The relationship between the severity of each ServerView RAID event (SNMP TRAP) and the type of event log displayed in the event window of the ServerView RAID Manager is as follows:

table: Event log type and description

Severity	Description	Severity with the ServerView RAID Manager		OS Event Log Type	
CRITICAL	Severe error		Error		Error
MAJOR	Error		Error		Error
MINOR	Warning		Warning		Warning
INFORMATIONAL	Information (No action required)		Informational		Information

table: List of ServerView RAID event log

ID	Severity	Log Entry	Description	Recovery Action
1	INFORMATIONAL	Undefined event (Server %s)	An undefined event has occurred.	If there is an error before or after the event, perform a proper recovery action for the error.
10000	INFORMATIONAL	Unknown event (Server %s)	An unknown event has occurred.	If there is an error before or after the event, perform a proper recovery action for the error.
10002	MINOR	Write access to ServerView RAID revoked by user %s (%s) (Server %s)	Write Access mode has been canceled. Another client has obtained Write Access mode.	None.
10021	INFORMATIONAL	Adapter %s: Disk (%s) marked online (Server %s)	The hard disk is now online.	None.
10022	CRITICAL	Adapter %s: Disk (%s) marked offline (Server %s)	The hard disk is now offline.	None.
10023	MAJOR	Adapter %s: Disk (%s) timed out (Server %s)	The hard disk has been timed out.	Check if the hard disk is connected properly. If the hard disk has failed, replace and perform rebuild.
10024	INFORMATIONAL	Adapter %s: Global hot spare created on disk (%s) (Server %s)	A spare disk has been created.	None. A spare disk is not supported.
10025	MINOR	Adapter %s: Global hot spare deleted on disk (%s) (Server %s)	A spare disk has been disabled.	None. A spare disk is not supported.
10028	INFORMATIONAL	Adapter %s: Disk (%s) marked available (Server %s)	The hard disk is now unused.	None.
10029	INFORMATIONAL	Adapter %s: Rebuild on disk (%s) started (Server %s)	Rebuilding the hard disk has started.	None.
10030	MAJOR	Adapter %s: Rebuild on disk (%s) failed (Server %s)	Rebuilding the hard disk has failed.	Check the current logical drive status. <ul style="list-style-type: none"> • For the critical state: Replace the failed hard disk and perform rebuild again. • For the offline state: Contact an office listed in the "Contact Information" of "Start Guide".
10032	INFORMATIONAL	Adapter %s: New disk (%s) detected (Server %s)	A new hard disk has been detected.	None. If this event is recorded at the same time as a hard disk failure, contact an office listed in the "Contact Information" of "Start Guide".

table: List of ServerView RAID event log

ID	Severity	Log Entry	Description	Recovery Action
10033	MINOR	Adapter %s: Disk (%s) removed (Server %s)	A hard disk has removed.	None. If this event is recorded at the same time as a hard disk failure except when you intend to remove the hard disk, contact an office listed in the "Contact Information" of "Start Guide".
10043	MAJOR	Adapter %s: Media error on disk (%s) (Server %s)	A medium error has been detected on the hard disk.	There is no problem as long as the target hard disk is online because the controller has performed a recovery.
10055	INFORMATIONAL	Adapter %s: Rebuild started on logical drive %s (Server %s)	Rebuilding the logical drive has started.	None.
10056	INFORMATIONAL	Adapter %s: Rebuild finished on logical drive %s (Server %s)	Rebuilding the logical drive is completed.	None.
10057	MAJOR	Adapter %s: Rebuild failed on logical drive %s (Server %s)	Rebuilding the logical drive has failed.	Check the current logical drive status. <ul style="list-style-type: none"> For the critical state: Replace the failed hard disk and perform rebuild again. For the offline state: Contact an office listed in the "Contact Information" of "Start Guide".
10058	MINOR	Adapter %s: Rebuild aborted on logical drive %s (Server %s)	Rebuilding the logical drive has been aborted.	Perform rebuild again.
10059	INFORMATIONAL	Adapter %s: Rebuild paused on logical drive %s (Server %s)	Rebuilding the logical drive has paused.	None.
10078	MAJOR	Adapter %s: Logical drive %s degraded (Server %s)	The logical drive is now critical.	Replace the failed hard disk and perform rebuild.
10079	CRITICAL	Adapter %s: Logical drive %s failed (Server %s)	The logical drive is now offline.	Contact an office listed in the "Contact Information" of "Start Guide".
10080	INFORMATIONAL	Adapter %s: Logical drive %s created (Server %s)	The logical drive has been created.	None.
10081	MINOR	Adapter %s: Logical drive %s deleted (Server %s)	The logical drive has been deleted.	None.
10082	INFORMATIONAL	Adapter %s: Logical drive %s operational (Server %s)	The logical drive is now online.	None.
10090	MINOR	Adapter %s: Initialization canceled on logical drive %s (Server %s)	Full initialization of the logical drive has been canceled.	None.
10095	INFORMATIONAL	Adapter %s: Alarm enabled (Server %s)	An alarm has been enabled.	None.
10096	MINOR	Adapter %s: Alarm disabled (Server %s)	An alarm has been disabled.	None.

table: List of ServerView RAID event log

ID	Severity	Log Entry	Description	Recovery Action
10100	INFORMATIONAL	Adapter %s: Rebuild rate changed (Server %s)	Rebuild Rate has been changed.	None.
10105	INFORMATIONAL	Adapter %s: Initialization set to normal (Server %s)	Initialization mode has been set to Normal.	None.
10106	INFORMATIONAL	Adapter %s: Initialization set to fast (Server %s)	Initialization mode has been set to Fast.	None.
10108	INFORMATIONAL	Adapter %s: Automatic rebuild enabled (Server %s)	Auto Rebuild has been enabled.	Enabling Auto Rebuild is not supported. Check the adapter settings.
10109	INFORMATIONAL	Adapter %s: Automatic rebuild disabled (Server %s)	Auto Rebuild has been disabled.	None.
10112	INFORMATIONAL	Adapter %s: MDC rate changed (Server %s)	MDC Rate has been changed.	None.
10113	INFORMATIONAL	Adapter %s: MDC rate changed to %s%% (Server %s)	MDC Rate has been changed.	None.
10114	INFORMATIONAL	Adapter %s: BIOS enabled (Server %s)	BIOS has been enabled.	None.
10115	INFORMATIONAL	Adapter %s: BIOS disabled (Server %s)	BIOS has been disabled.	None. Disabling BIOS is not supported.
10118	INFORMATIONAL	Adapter %s: Write cache on all disks enabled (Server %s)	Write cache has been enabled on all hard disks.	Enabling write cache is not supported. Check the logical drive settings.
10119	INFORMATIONAL	Adapter %s: Write cache on all disks disabled (Server %s)	Write cache has been disabled on all hard disks.	None.
10120	INFORMATIONAL	Adapter %s: Read-ahead on all disks enabled (Server %s)	Read Ahead has been enabled on all hard disks.	None.
10121	INFORMATIONAL	Adapter %s: Read-ahead on all disks disabled (Server %s)	Read Ahead has been disabled on all hard disks.	Disabling Read Ahead is not supported. Check the logical drive settings.
10132	INFORMATIONAL	Adapter %s: Configuration rescanned (Server %s)	The array configuration has been rescanned.	None.
10133	INFORMATIONAL	Adapter %s: Configuration cleared (Server %s)	The array configuration has been deleted.	None.
10168	INFORMATIONAL	Adapter %s: Logical drive %s: Name changed (Server %s)	The name of the logical drive has been changed.	None.
10169	INFORMATIONAL	Adapter %s: Logical drive %s: Cache write mode changed (Server %s)	Write cache mode has changed.	Enabling write cache is not supported. Check the settings.
10171	INFORMATIONAL	User %s (%s) logged in (Server %s)	The user has logged in.	None.
10172	INFORMATIONAL	User %s (%s) logged out (Server %s)	The user has logged out.	None.

table: List of ServerView RAID event log

ID	Severity	Log Entry	Description	Recovery Action
10221	MAJOR	Adapter %s: Multi-bit ECC error: ECAR=%s ELOG=%s (%s) (Server %s)	A multi-bit error has been detected.	Contact an office listed in the "Contact Information" of "Start Guide".
10222	MAJOR	Adapter %s: Single-bit ECC error: ECAR=%s ELOG=%s (%s) (Server %s)	A single-bit error has been detected.	Contact an office listed in the "Contact Information" of "Start Guide".
10226	INFORMATIONAL	Adapter %s: Shutdown command received from host (Server %s)	The shutdown command was received from the server.	None.
10227	INFORMATIONAL	Adapter %s: Test event: '%s' (Server %s)	A test event has been issued.	None.
10228	INFORMATIONAL	Adapter %s: Time established as %s; (%s seconds since power on) (Server %s)	The current time has been set.	None.
10229	INFORMATIONAL	Adapter %s: User entered firmware debugger (Server %s)	The firmware has entered the debug mode.	None.
10235	INFORMATIONAL	Adapter %s: Logical drive %s: %s changed (Server %s)	Properties of the logical drive have been changed.	None.
10236	INFORMATIONAL	Adapter %s: MDC corrected medium error (logical drive %s at LBA %s on disk (%s) at LBA %s) (Server %s)	A medium error has been corrected during the Make Data Consistent.	None.
10240	MAJOR	Adapter %s: Initialization failed on logical drive %s (Server %s)	Foreground initialization has failed.	Check the log entries around this entry and take the necessary measures.
10241	INFORMATIONAL	Adapter %s: Initialization progress on logical drive %s is %s (Server %s)	Foreground initialization is in progress.	None.
10242	INFORMATIONAL	Adapter %s: Fast initialization started on logical drive %s (Server %s)	Fast initialization has started.	None.
10243	INFORMATIONAL	Adapter %s: Full initialization started on logical drive %s (Server %s)	Full initialization has started.	None.
10244	INFORMATIONAL	Adapter %s: Logical drive %s: Property %s updated (Server %s)	A property of the logical drive has been changed.	None.
10249	INFORMATIONAL	Adapter %s: State change on logical drive %s from operational to operational (Server %s)	The logical drive is now online.	None.
10255	MAJOR	Adapter %s: Error on disk (%s) (error %s) (Server %s)	An error has occurred on the hard disk.	Replace the failed hard disk and perform rebuild.
10259	MAJOR	Adapter %s: Disk (%s) is not supported (Server %s)	An unsupported hard disk has been detected.	Use a supported hard disk.
10263	MINOR	Adapter %s: Predictive failure: Disk (%s) (Server %s)	A hard disk failure has been predicted.	Replace the hard disk as a preventive measure.

table: List of ServerView RAID event log

ID	Severity	Log Entry	Description	Recovery Action
10264	MAJOR	Adapter %s: Puncturing bad block on disk (%s) at LBA %s (Server %s)	A medium error has been detected in the source disk drive during the rebuild.	If an unreadable file is found during the operation, restore the file from the backup.
10265	MINOR	Adapter %s: Rebuild aborted by user on disk (%s) (Server %s)	Rebuilding has been canceled.	Perform rebuild again.
10266	INFORMATIONAL	Adapter %s: Rebuild complete on logical drive %s (Server %s)	Rebuilding the logical drive is completed.	None.
10267	INFORMATIONAL	Adapter %s: Rebuild complete on disk (%s) (Server %s)	Rebuilding the hard disk is completed.	None.
10268	INFORMATIONAL	Adapter %s: Rebuild progress on disk (%s) is %s (Server %s)	Rebuilding is in progress.	None.
10269	INFORMATIONAL	Adapter %s: Rebuild resumed on disk (%s) (Server %s)	Rebuilding has resumed.	None.
10270	INFORMATIONAL	Adapter %s: Rebuild automatically started on disk (%s) (Server %s)	Rebuilding the hard disk has started automatically.	None.
10272	MAJOR	Adapter %s: Reassign write operation failed on disk (%s) at LBA %s (Server %s)	The reassign operation has failed.	Replace the failed hard disk and perform rebuild.
10273	MAJOR	Adapter %s: Unrecoverable medium error during rebuild on disk (%s) at LBA %s (Server %s)	An unrecoverable media error has been detected during the rebuild.	If an unreadable file is found during the operation, restore the file from the backup.
10274	INFORMATIONAL	Adapter %s: Corrected medium error during recovery on disk (%s) at LBA %s (Server %s)	A medium error has been recovered.	None.
10275	MAJOR	Adapter %s: Unrecoverable medium error during recovery on disk (%s) at LBA %s (Server %s)	An unrecoverable media error has been detected.	If an unreadable file is found during the operation, restore the file from the backup.
10294	MAJOR	Adapter %s: Unable to access disk (%s) (Server %s)	The hard disk cannot be accessed.	Replace the failed hard disk and perform rebuild.
10296	MINOR	Adapter %s: Global hot spare does not cover all arrays (Server %s)	No array is available for a spare disk.	A spare disk is not supported. Check the array configuration.
10297	MINOR	Adapter %s: Marking logical drive %s inconsistent due to active writes at shutdown (Server %s)	The consistency of the logical drive has been lost due to shutdown during the Write operation.	Perform Make Data Consistent.
10336	MINOR	Adapter %s: Disk (%s) too small to be used for auto rebuild (Server %s)	The hard disk capacity is insufficient to perform rebuild.	Replace the hard disk with one of sufficient capacity.

table: List of ServerView RAID event log

ID	Severity	Log Entry	Description	Recovery Action
10339	INFORMATIONAL	Adapter %s: Bad block table on disk (%s) is 80% full (Server %s)	The Bad Block Table use rate has exceeded 80%.	Replace the hard disk as a preventive measure.
10340	MINOR	Adapter %s: Bad block table on disk (%s) is full; unable to log Block %s (Server %s)	The Bad Block Table is full.	Replace the hard disk as a preventive measure.
10341	MINOR	Adapter %s: MDC aborted due to ownership loss on logical drive %s (Server %s)	The Make Data Consistent has been aborted due to an ownership change.	If necessary, perform Make Data Consistent again.
10356	INFORMATIONAL	Adapter %s: %s test completed %s passes successfully (Server %s)	The test is completed.	None.
10357	MINOR	Adapter %s: %s test FAILED on %s pass. fail data: errorOffset=%s goodData=%s badData=%s (Server %s)	The test has failed.	Contact an office listed in the "Contact Information" of "Start Guide".
10358	INFORMATIONAL	Adapter %s: Self-check diagnostics completed (Server %s)	The self-test is completed.	None.
10367	MINOR	Adapter %s: Bad block reassigned on disk (%s) from LBA %s to LBA %s (Server %s)	A bad block of the hard disk has been relocated.	None.
10371	INFORMATIONAL	Adapter %s: Time duration provided by host is not sufficient for self-checking (Server %s)	The system has not provided enough time for self-checking.	Contact an office listed in the "Contact Information" of "Start Guide".
10372	INFORMATIONAL	Adapter %s: Disk (%s) on array %s row %s marked missing (Server %s)	The hard disk has been marked as missing.	Replace the failed hard disk and perform rebuild.
10377	MINOR	Adapter %s: Disk (%s) is not a certified drive (Server %s)	The hard disk is not a certified disk.	Replace the hard disk with a certified disk.
10379	MINOR	Adapter %s: Disks missing from configuration at boot (Server %s)	An undetectable hard disk was found during startup.	Replace the failed hard disk and perform rebuild.
10380	MINOR	Adapter %s: Logical drives missing drives and will go offline at boot: %s (Server %s)	The logical drive went offline during startup.	Replace the failed hard disk and perform rebuild.
10382	MINOR	Adapter %s: Previous configuration completely missing at boot (Server %s)	The previous configuration was not found during startup.	Turn off the server and check that hard disks, cables, the power supply, etc. are connected properly. If this error occurs again, contact an office listed in the "Contact Information" of "Start Guide".
10385	INFORMATIONAL	Adapter %s: Dedicated hot spare (%s) imported as global due to missing arrays (Server %s)	The dedicated spare disk has been imported as a spare disk because no target array exists.	None.

table: List of ServerView RAID event log

ID	Severity	Log Entry	Description	Recovery Action
10386	INFORMATIONAL	Adapter %s: Disk (%s) rebuild not possible as SAS/SATA is not supported in an array (Server %s)	Rebuilding the hard disk is unavailable because SAS/SATA is not supported.	None.
10388	MAJOR	Adapter %s: Logical drive %s partially degraded (Server %s)	The logical drive is now partially critical.	Replace the failed hard disk and perform rebuild.
10390	INFORMATIONAL	Adapter %s: Coercion mode changed (Server %s)	The coercion mode has been changed.	None.
10398	MAJOR	Adapter %s: MDC finished with errors on logical drive %s (Server %s)	Make Data Consistent is completed, but multiple media errors were detected during the Make Data Consistent.	If an unreadable file is found during the operation, restore the file from the backup.
10402	MINOR	Adapter %s: Disk missing (Server %s)	No hard disk exists.	Replace the failed hard disk and perform rebuild.
10403	INFORMATIONAL	Adapter %s: Rebuild rate changed to %s%% (Server %s)	Rebuild Rate has been changed.	None.
10406	INFORMATIONAL	Adapter %s: MDC started on logical drive %s (Server %s)	Make Data Consistent has started.	None.
10407	INFORMATIONAL	Adapter %s: MDC finished on logical drive %s (Server %s)	Make Data Consistent is completed.	None.
10408	MAJOR	Adapter %s: MDC failed on logical drive %s (Server %s)	Make Data Consistent has failed.	Replace the failed hard disk and perform rebuild.
10409	MINOR	Adapter %s: MDC aborted on logical drive %s (Server %s)	Make Data Consistent has been aborted.	If necessary, perform the Make Data Consistent again.
10410	INFORMATIONAL	Adapter %s: MDC paused on logical drive %s (Server %s)	Make Data Consistent has paused.	None.
10411	INFORMATIONAL	Adapter %s: MDC started on uninitialized logical drive %s (Server %s)	Make Data Consistent for an uninitialized logical drive has started.	None.
10412	MAJOR	Adapter %s: State change on logical drive %s from operational to degraded (Server %s)	The logical drive has changed from online to critical.	Replace the failed hard disk and perform rebuild.
10413	MAJOR	Adapter %s: State change on logical drive %s from operational to partially degraded (Server %s)	The logical drive has changed from online to partially critical.	Replace the failed hard disk and perform rebuild.
10414	CRITICAL	Adapter %s: State change on logical drive %s from operational to failed (Server %s)	The logical drive has changed from online to offline.	Contact an office listed in the "Contact Information" of "Start Guide".
10415	INFORMATIONAL	Adapter %s: State change on logical drive %s from degraded to operational (Server %s)	The logical drive has been restored from critical to online.	None.

table: List of ServerView RAID event log

ID	Severity	Log Entry	Description	Recovery Action
10416	MAJOR	Adapter %s: State change on logical drive %s from degraded to degraded (Server %s)	The logical drive is now critical.	Replace the failed hard disk and perform rebuild.
10417	MAJOR	Adapter %s: State change on logical drive %s from degraded to partially degraded (Server %s)	The logical drive has changed from critical to partially critical.	Replace the failed hard disk and perform rebuild.
10418	CRITICAL	Adapter %s: State change on logical drive %s from degraded to failed (Server %s)	The logical drive has changed from critical to offline.	Contact an office listed in the "Contact Information" of "Start Guide".
10419	INFORMATIONAL	Adapter %s: State change on logical drive %s from partially degraded to operational (Server %s)	The logical drive has been restored from partially critical to online.	None.
10420	MAJOR	Adapter %s: State change on logical drive %s from partially degraded to degraded (Server %s)	The logical drive has changed from partially critical to critical.	Replace the failed hard disk and perform rebuild.
10421	MAJOR	Adapter %s: State change on logical drive %s from partially degraded to partially degraded (Server %s)	The logical drive is now partially critical.	Replace the failed hard disk and perform rebuild.
10422	CRITICAL	Adapter %s: State change on logical drive %s from partially degraded to failed (Server %s)	The logical drive has changed from partially critical to offline.	Contact an office listed in the "Contact Information" of "Start Guide".
10423	INFORMATIONAL	Adapter %s: State change on logical drive %s from failed to operational (Server %s)	The logical drive has changed from offline to online.	None.
10424	MAJOR	Adapter %s: State change on logical drive %s from failed to degraded (Server %s)	The logical drive has changed from offline to critical.	Replace the failed hard disk and perform rebuild.
10425	MAJOR	Adapter %s: State change on logical drive %s from failed to partially degraded (Server %s)	The logical drive has changed from offline to partially critical.	Replace the failed hard disk and perform rebuild.
10426	CRITICAL	Adapter %s: State change on logical drive %s from failed to failed (Server %s)	The logical drive is now offline.	Contact an office listed in the "Contact Information" of "Start Guide".
10427	CRITICAL	Adapter %s: State change by user on disk (%s) from available to failed (Server %s)	The hard disk has changed from unused to failed.	Replace the failed hard disk.
10428	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from available to hot spare (Server %s)	The hard disk has changed from unused to a spare disk.	Not supported. Check the configuration.
10429	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from available to rebuilding (Server %s)	The hard disk has changed from unused to rebuilding.	None.

table: List of ServerView RAID event log

ID	Severity	Log Entry	Description	Recovery Action
10430	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from available to operational (Server %s)	The hard disk has changed from unused to online.	None.
10431	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from failed to available (Server %s)	The hard disk has changed from failed to unused.	None.
10432	CRITICAL	Adapter %s: State change by user on disk (%s) from failed to failed (Server %s)	The hard disk is now failed.	Replace the failed hard disk and perform rebuild.
10433	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from failed to hot spare (Server %s)	The hard disk has changed from the failed to a spare disk.	A spare disk is not supported. Check the configuration.
10434	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from failed to rebuilding (Server %s)	The hard disk has changed from failed to rebuilding.	None.
10435	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from failed to operational (Server %s)	The hard disk has changed from failed to online.	None.
10436	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from hot spare to available (Server %s)	The hard disk has changed from a spare disk to the unused.	None.
10437	CRITICAL	Adapter %s: State change by user on disk (%s) from hot spare to failed (Server %s)	The hard disk has changed from a spare disk to the failed.	A spare disk is not supported. Check the configuration.
10438	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from hot spare to hot spare (Server %s)	The hard disk is now a spare disk.	A spare disk is not supported. Check the configuration.
10439	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from hot spare to rebuilding (Server %s)	The hard disk has changed from a spare disk to the rebuilding.	A spare disk is not supported. Check the configuration.
10440	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from hot spare to operational (Server %s)	The hard disk has changed from a spare disk to the online.	A spare disk is not supported. Check the configuration.
10441	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from rebuilding to available (Server %s)	The hard disk has changed from rebuilding to unused.	None.
10442	CRITICAL	Adapter %s: State change by user on disk (%s) from rebuilding to failed (Server %s)	The hard disk has changed from rebuilding to failed.	Replace the failed hard disk and perform rebuild.
10443	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from rebuilding to hot spare (Server %s)	The hard disk has changed from the rebuilding to a spare disk.	A spare disk is not supported. Check the configuration.

table: List of ServerView RAID event log

ID	Severity	Log Entry	Description	Recovery Action
10444	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from rebuilding to rebuilding (Server %s)	The hard disk is now rebuilding.	None.
10445	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from rebuilding to operational (Server %s)	The hard disk has changed from rebuilding to online.	None.
10446	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from operational to available (Server %s)	The hard disk has changed from online to unused.	None.
10447	CRITICAL	Adapter %s: State change by user on disk (%s) from operational to failed (Server %s)	The hard disk has changed from online to failed.	Replace the failed hard disk and perform rebuild.
10448	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from operational to hot spare (Server %s)	The hard disk has changed from the online to a spare disk.	A spare disk is not supported. Check the configuration.
10449	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from operational to rebuilding (Server %s)	The hard disk has changed from online to rebuilding.	None.
10450	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from operational to operational (Server %s)	The hard disk is now online.	None.
10451	CRITICAL	Adapter %s: State change on disk (%s) from available to failed (Server %s)	The hard disk has changed from unused to failed.	Replace the failed hard disk.
10452	INFORMATIONAL	Adapter %s: State change on disk (%s) from available to hot spare (Server %s)	The hard disk has changed from the unused to a spare disk.	A spare disk is not supported. Check the configuration.
10453	INFORMATIONAL	Adapter %s: State change on disk (%s) from available to rebuilding (Server %s)	The hard disk has changed from unused to rebuilding.	None.
10454	INFORMATIONAL	Adapter %s: State change on disk (%s) from available to operational (Server %s)	The hard disk has changed from unused to online.	None.
10455	INFORMATIONAL	Adapter %s: State change on disk (%s) from failed to available (Server %s)	The hard disk has changed from failed to unused.	None.
10456	CRITICAL	Adapter %s: State change on disk (%s) from failed to failed (Server %s)	The hard disk is now failed.	Replace the failed hard disk and perform rebuild.
10457	INFORMATIONAL	Adapter %s: State change on disk (%s) from failed to hot spare (Server %s)	The hard disk has changed from the failed to a spare disk.	A spare disk is not supported. Check the configuration.
10458	INFORMATIONAL	Adapter %s: State change on disk (%s) from failed to rebuilding (Server %s)	The hard disk has changed from failed to rebuilding.	None.

table: List of ServerView RAID event log

ID	Severity	Log Entry	Description	Recovery Action
10459	INFORMATIONAL	Adapter %s: State change on disk (%) from failed to operational (Server %s)	The hard disk has changed from failed to online.	None.
10460	INFORMATIONAL	Adapter %s: State change on disk (%) from hot spare to available (Server %s)	The hard disk has changed from a spare disk to the unused.	None.
10461	CRITICAL	Adapter %s: State change on disk (%) from hot spare to failed (Server %s)	The hard disk has changed from a spare disk to the failed.	Replace the failed hard disk and configure the new disk as a spare disk.
10462	INFORMATIONAL	Adapter %s: State change on disk (%) from hot spare to hot spare (Server %s)	The hard disk is now a spare disk.	A spare disk is not supported. Check the configuration.
10463	INFORMATIONAL	Adapter %s: State change on disk (%) from hot spare to rebuilding (Server %s)	The hard disk has changed from a spare disk to the rebuilding.	A spare disk is not supported. Check the configuration.
10464	INFORMATIONAL	Adapter %s: State change on disk (%) from hot spare to operational (Server %s)	The hard disk has changed from a spare disk to the online.	A spare disk is not supported. Check the configuration.
10465	INFORMATIONAL	Adapter %s: State change on disk (%) from rebuilding to available (Server %s)	The hard disk has changed from rebuilding to unused.	None.
10466	CRITICAL	Adapter %s: State change on disk (%) from rebuilding to failed (Server %s)	The hard disk has changed from rebuilding to failed.	Replace the failed hard disk and perform rebuild.
10467	INFORMATIONAL	Adapter %s: State change on disk (%) from rebuilding to hot spare (Server %s)	The hard disk has changed from the rebuilding to a spare disk.	A spare disk is not supported. Check the configuration.
10468	INFORMATIONAL	Adapter %s: State change on disk (%) from rebuilding to rebuilding (Server %s)	The hard disk is now rebuilding.	None.
10469	INFORMATIONAL	Adapter %s: State change on disk (%) from rebuilding to operational (Server %s)	The hard disk has changed from rebuilding to online.	None.
10470	INFORMATIONAL	Adapter %s: State change on disk (%) from operational to available (Server %s)	The hard disk has changed from online to unused.	None.
10471	CRITICAL	Adapter %s: State change on disk (%) from operational to failed (Server %s)	The hard disk has changed from online to failed.	Replace the failed hard disk and perform rebuild.
10472	INFORMATIONAL	Adapter %s: State change on disk (%) from operational to hot spare (Server %s)	The hard disk has changed from the online to a spare disk.	A spare disk is not supported. Check the configuration.
10473	INFORMATIONAL	Adapter %s: State change on disk (%) from operational to rebuilding (Server %s)	The hard disk has changed from online to rebuilding.	None.
10474	INFORMATIONAL	Adapter %s: State change on disk (%) from operational to operational (Server %s)	The hard disk is now online.	None.

table: List of ServerView RAID event log

ID	Severity	Log Entry	Description	Recovery Action
10475	MAJOR	Adapter %s: MDC detected uncorrectable multiple medium errors (disk (%s) at LBA %s on logical drive %s) (Server %s)	Multiple media errors have been detected during Make Data Consistent.	If an unreadable file is found during the operation, restore the file from the backup.
10476	MAJOR	Adapter %s: Disk (%s) missing after reboot (Server %s)	A hard disk was not found after the reboot.	Replace the failed hard disk and perform rebuild. Note: ▶ This event may occur after installing or removing an option card. In this case, check the array status using ServerView RAID Manager. If the array status is normal, the recovery action is not necessary.
10477	MAJOR	Adapter %s: Logical drive (%s) missing after reboot (Server %s)	A logical drive was not found after the reboot.	There is no problem if this error occurred after changing the array configuration. If this error occurred during ordinary operation, contact an office listed in the "Contact Information" of "Start Guide". Note: ▶ This event may occur after installing or removing an option card. In this case, check the array status using ServerView RAID Manager. If the array status is normal, the recovery action is not necessary.
10478	INFORMATIONAL	Adapter %s: disk (%s) appeared new after reboot (Server %s)	A new hard disk has been found after the reboot.	None.
10479	INFORMATIONAL	Adapter %s: Logical drive %s appeared new after reboot (Server %s)	A new logical drive has been found after the reboot.	None.
10485	INFORMATIONAL	Adapter %s: State change on disk (%s) from available to offline (Server %s)	The hard disk has changed from unused to offline.	None.
10486	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from available to offline (Server %s)	The hard disk has changed from unused to offline.	None.

table: List of ServerView RAID event log

ID	Severity	Log Entry	Description	Recovery Action
10487	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from failed to offline (Server %s)	The hard disk has changed from failed to offline.	None.
10488	MINOR	Adapter %s: State change by user on disk (%s) from hot spare to offline (Server %s)	The hard disk has changed from a spare disk to the offline.	Replace the failed hard disk and perform rebuild.
10489	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from offline to available (Server %s)	The hard disk has changed from offline to unused.	None.
10490	MAJOR	Adapter %s: State change by user on disk (%s) from offline to failed (Server %s)	The hard disk has changed from offline to failed.	Replace the failed hard disk and perform rebuild.
10491	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from offline to hot spare (Server %s)	The hard disk has changed from the offline to a spare disk.	None.
10492	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from offline to offline (Server %s)	The hard disk has changed from offline to offline.	None.
10493	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from offline to operational (Server %s)	The hard disk has changed from offline to online.	None.
10494	INFORMATIONAL	Adapter %s: State change by user on disk (%s) from offline to rebuilding (Server %s)	The hard disk has changed from offline to rebuilding.	None.
10495	MINOR	Adapter %s: State change by user on disk (%s) from operational to offline (Server %s)	The hard disk has changed from online to offline.	Replace the failed hard disk and perform rebuild.
10496	MINOR	Adapter %s: State change by user on disk (%s) from rebuilding to offline (Server %s)	The hard disk has changed from rebuilding to offline.	Replace the failed hard disk and perform rebuild.
10497	INFORMATIONAL	Adapter %s: State change on disk (%s) from failed to offline (Server %s)	The hard disk has changed from failed to offline.	None.
10498	MINOR	Adapter %s: State change on disk (%s) from hot spare to offline (Server %s)	The hard disk has changed from a spare disk to the offline.	Replace the failed hard disk and perform rebuild.
10499	INFORMATIONAL	Adapter %s: State change on disk (%s) from offline to available (Server %s)	The hard disk has changed from offline to unused.	None.
10500	MAJOR	Adapter %s: State change on disk (%s) from offline to failed (Server %s)	The hard disk has changed from offline to failed.	Replace the failed hard disk and perform rebuild.
10501	INFORMATIONAL	Adapter %s: State change on disk (%s) from offline to hot spare (Server %s)	The hard disk has changed from the offline to a spare disk.	None.
10502	INFORMATIONAL	Adapter %s: State change on disk (%s) from offline to offline (Server %s)	The hard disk has changed from offline to offline.	None.

table: List of ServerView RAID event log

ID	Severity	Log Entry	Description	Recovery Action
10503	INFORMATIONAL	Adapter %s: State change on disk (%s) from offline to operational (Server %s)	The hard disk has changed from offline to online.	None.
10504	INFORMATIONAL	Adapter %s: State change on disk (%s) from offline to rebuilding (Server %s)	The hard disk has changed from offline to rebuilding.	None.
10505	MINOR	Adapter %s: State change on disk (%s) from operational to offline (Server %s)	The hard disk has changed from online to offline.	Replace the failed hard disk and perform rebuild.
10506	MINOR	Adapter %s: State change on disk (%s) from rebuilding to offline (Server %s)	The hard disk has changed from rebuilding to offline.	Replace the failed hard disk and perform rebuild.
10509	INFORMATIONAL	Adapter %s: Rebuild on disk (%s) resumed (Server %s)	Rebuilding the hard disk has resumed.	None.
10513	INFORMATIONAL	Adapter %s: Rebuild on logical drive %s resumed (Server %s)	Rebuilding the logical drive has resumed.	None.
10526	CRITICAL	Adapter %s: Adapter missing after reboot (Server %s)	An array controller was not found after the reboot.	Contact an office listed in the "Contact Information" of "Start Guide".
10527	INFORMATIONAL	Adapter %s: Adapter appeared new after reboot (Server %s)	A new array controller has been found after the reboot.	None.
10528	MINOR	Adapter %s: Rebuild aborted on disk (%s) (Server %s)	Rebuilding has been aborted.	If there is a failed hard disk, replace the hard disk and perform rebuild.
10531	INFORMATIONAL	Adapter %s: MDC finished with %s correctable errors on logical drive %s (Server %s)	Make Data Consistent is completed, and errors have been corrected.	None.
10532	MAJOR	Adapter %s: MDC finished with %s uncorrectable errors on logical drive %s (Server %s)	Make Data Consistent is completed, but some errors were not corrected.	None.
10534	MINOR	Adapter %s: Changed adapter property detected after reboot (Server %s)	Setting value of the controller has been changed after the reboot.	Check the setting value of the controller. If unsupported value has been set, change the value.
10538	MINOR	Adapter %s: Bad block table on logical drive %s is 80%% full (Server %s)	Bad Block Table use rate on a logical drive has exceeded 80%.	None.
10539	MAJOR	Adapter %s: Bad block table on logical drive %s is full; unable to log LBA %s (on disk (%s) at LBA %s) (Server %s)	Bad Block Table on a logical drive has been full, and an additional new Bad Block was not recorded.	None.
10540	MAJOR	Adapter %s: Uncorrectable media error logged for logical drive %s at LBA %s (on disk (%s) at LBA %s) (Server %s)	Uncorrectable media errors have been detected.	If an unreadable file is found during the operation, restore the file from the backup.

table: List of ServerView RAID event log

ID	Severity	Log Entry	Description	Recovery Action
10541	MINOR	Adapter %s: Medium error corrected on logical drive %s at LBA %s (Server %s)	Media errors have been corrected.	None.
10542	MINOR	Adapter %s: Bad block table on disk (%s) is 100%% full (Server %s)	Bad Block Table on a hard disk is full.	Replace the failed hard disk as a preventive measure.
10557	INFORMATIONAL	Adapter %s: BIOS continue on error enabled (Server %s)	BIOS continue on error is enabled.	None.
10558	INFORMATIONAL	Adapter %s: BIOS continue on error disabled (Server %s)	BIOS continue on error is disabled.	None.
10559	INFORMATIONAL	Adapter %s: Additional information for failed disk (%s) - firmware version: %s, serial number %s, first use: %s, total running time: %s days (Server %s)	Additional information of the failed hard disk is displayed.	None.

B Setting E-mail Notification for Hard Disk Failure

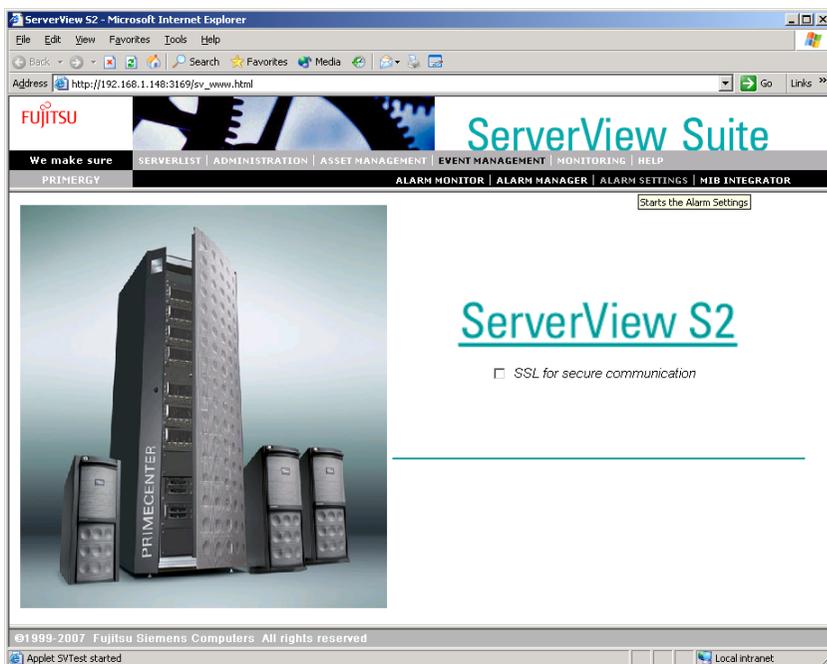
This section explains how to receive hard disk failure notifications via e-mail using ServerView AlarmService.

Follow the procedure below with ServerView. For more information, see the "ServerView User's Guide" on the "PRIMERGY Startup Disc" supplied with the server.



- ▶ This e-mail notification tool is not supported on authentication functions, such as POP before SMTP or SMTP auth.

- 1 Display the [Start Alarm Settings] window from ServerView S2.
Start ServerView S2, and click [EVENT MANAGEMENT] – [ALARM SETTINGS].



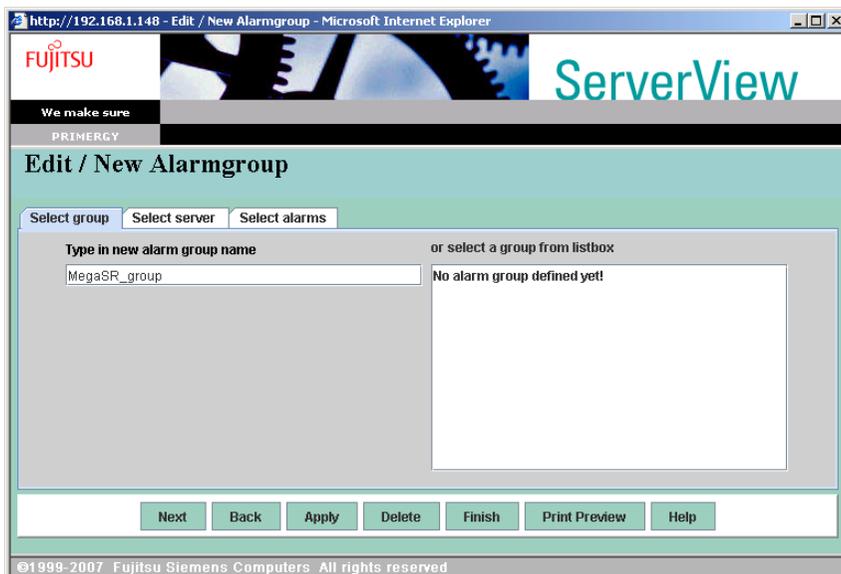
The [Start Alarm Settings] window appears.

- 2** Select [Edit / New Alarmgroup] and click [Next].



The [Select group] tab in the [Edit / New Alarmgroup] window appears.

- 3** Create a new alarm group. Type a group name ("MegaSR_group" in the following screenshot) in the box of "Type in new alarm group name", and click the [Select server] tab.



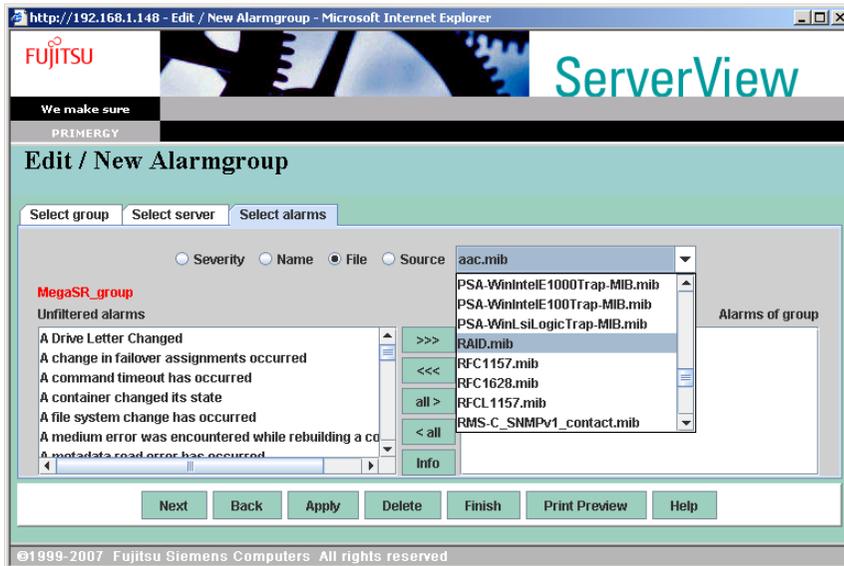
The [Select server] tab window appears.

- 4 Select the server belongs to the alarm group.
Select the server from [Known server], and click [>>>]. Then, click the [Select alarms] tab.



The [Select alarms] tab window appears.

- 5 Specify the "mib" file including the events to be notified via e-mail.
Select [File], and select [RAID.mib] from the pulldown menu.



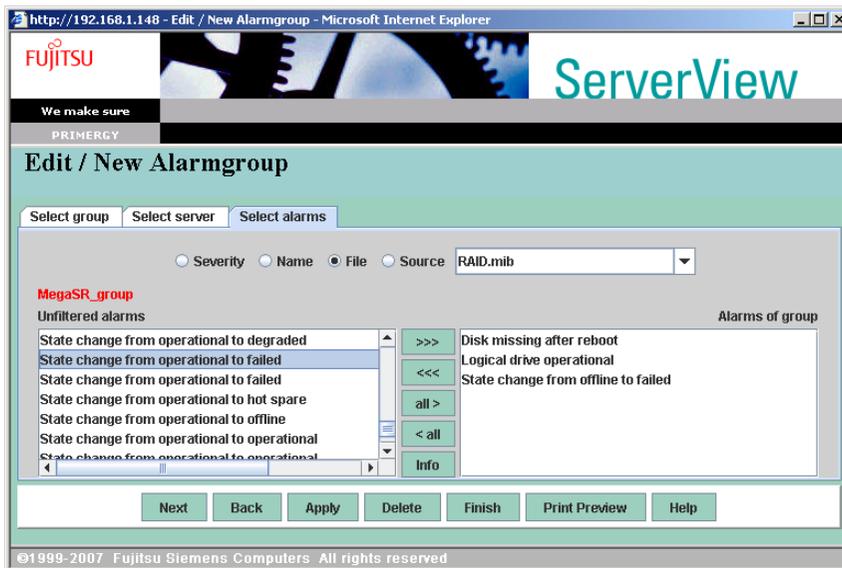
6 Specify the events to be notified via e-mail.

Select the following alarms from the [Unfiltered alarms], and click [>>>] to add to [Alarms of groups].

- Disk missing after reboot
- Logical drive operational
- State change from offline to failed
- State change from operational to failed
- State change from operational to failed
- State change from operational to offline
- State change from rebuild to failed
- State change from rebuild to offline
- State change from rebuild to operational

POINT

- ▶ There are two "State change from operational to failed", but add both.

**7** When you complete step 3 to 6 above for [Select group], [Select server] and [Select alarms], click [Apply] and then click [Next].

The [Set / Edit Destination] window appears.

- 8 Check that the alarm group you created in step 3 is selected in [Defined alarm groups], and click [Mail] from [Destinations for the selected group].



The [Set / Edit mail for group] window appears.

- 9 Create new mail settings. Click [New].



10 Set each item for e-mail notifications.

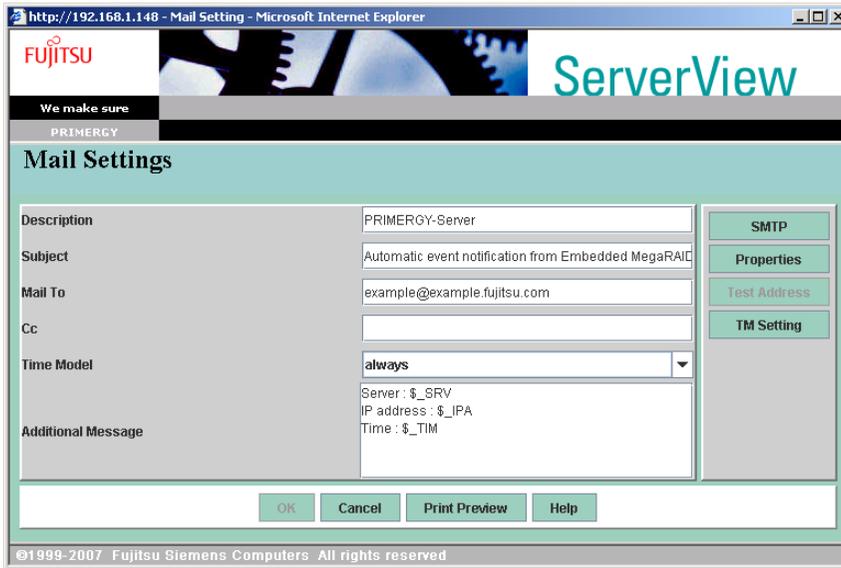


table: Mail setting

Item	Description
Name	Enter the name of the mail settings.
Subject	Enter the subject for the outgoing mail.
Mail to	Enter the destination address of the mail.
Cc	Enter the CC address of the mail when you want to send the copy to multiple addresses.
Time Model	Do not change from [always].
Additional Message	Server : \$_SRV IP address : \$_IPA Time : \$_TIM

11 Click [Properties].

The [Mail Properties (SMTP)] window appears.

12 Set a mail account for e-mail notifications.



table: Mail account setting

Item	Description
From	Enter the mail address used for e-mail notifications.
SMTP Server	Enter the mail server address.
Port	Normally not required to change from "25".

13 Click [OK].

It takes you back to the [Mail Settings] window.

14 To confirm the mail account set in step 12, click [Test Address].

The test mail is sent to the address you set.

15 Click [OK].

It takes you back to the [Set / Edit mail for group test] window.

16 Click [Apply], and click [Back].

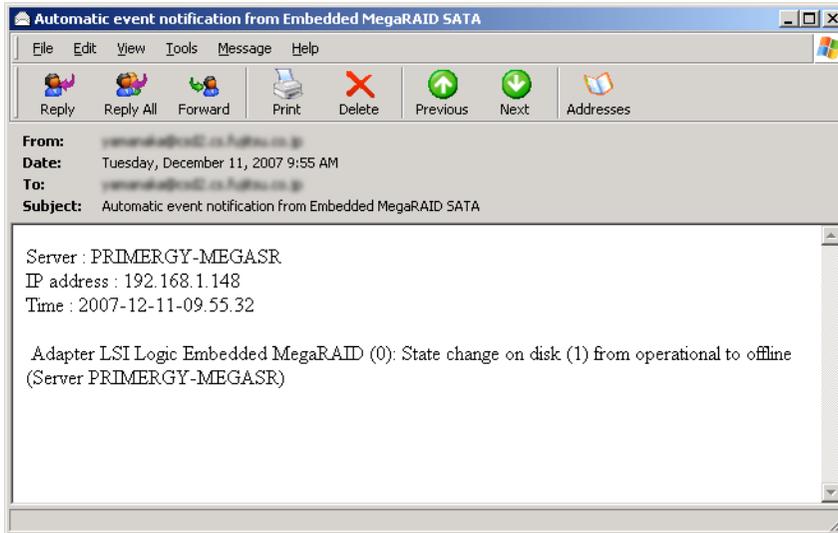
It takes you back to the [Set / Edit Destination] window.

17 Click [Next].

The [Overview] window appears.

18 Check the configuration, and click [Finish] to exit.

The settings are completed. At a hard disk failure, such e-mail as shown below will be sent.



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Embedded MegaRAID SATA
User's Guide

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