NEC

NEC ESMPRO Manager
RAID System Management Guide

NEC Express Server
Express5800 Series

for VMware ESXi 5 or later

Overview
System requirements of RAID System Management function
Registering RAID System Management function
Functions of Web GUI
Referring to Information on RAID System
Maintenance of RAID System
Making and Removing Hot Spare
Troubleshooting RAID System
Notes on Use
Appendix A : Glossary
Appendix B : Logs/Events

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Introduction

This User's Guide describes NEC ESMPRO Manager RAID System Management function.
This User's Guide consists of the following three files.

- NEC ESMPRO Manager RAID System Management Guide : This file (esm_fg_raid_esxi5_e.pdf)
- Appendix A : Glossary (esm_fg_raid_esxi5_ea.pdf)
- Appendix B : Logs/Events (esm_fg_raid_esxi5_eb.pdf)

The content of this Guide is based on the premise that the RAID System environment you are using is on VMware ESXi 5 or later. See "Appendix A: Glossary" for the terms on this Guide.

Before using the function, you should carefully read the User's Guide of the RAID System to be managed and that of the computer in which the RAID System is installed.

The User's Guide is intended to be read by engineers who are fully familiar with the functions and operations of operating systems. See the operating system online help and related documentation for the operations and concerns of the operating system.

The pictures about NEC ESMPRO Manager in this document are the one as of the writing. They are sometimes different from the version which you use.

Symbols used in the text

The User's Guide uses the following three symbols. Follow these symbols and their meanings to use the RAID System environment appropriately.

Symbol	Description
	Indicates a matter or caution you should particularly obey on operations of the function.
	Indicates a notice you should check to operate the function.
	Indicates effective or convenient information which help you if you know them.

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Overview

This chapter describes the overview of the NEC ESMPRO Manager RAID System Management.

NEC ESMPRO Manager is the software that reduces the operation management cost by managing the server remotely.
For details of NEC ESMPRO Manager, see the following documents.

- NEC ESMPRO Manager Installation Guide
- NEC ESMPRO Manager Setup Guide
- NEC ESMPRO Manager Command Line Interface
- NEC ESMPRO Manager Command Line Interface Users Guide – ExpressUpdate Management

What is RAID System Management function?

The NEC ESMPRO Manager RAID System Management function is characterized as follows.

1. Allowing a variety of RAID Systems to be managed

   Conventionally, a specific management utility must be used for each RAID System. On the other hand, only the NEC ESMPRO Manager can manage more than one RAID System. For the RAID Systems which the NEC ESMPRO Manager can manage, see the documentation for your computers and RAID Systems.

2. Operating in either Standard or Advanced Mode

   The NEC ESMPRO Manager RAID System Management function can operate in two RAID System Management Modes, which are Standard Mode and Advanced Modes.
   The Standard Mode provides the RAID System Management function with standard management functions of RAID Systems.
   The Advanced Mode provides the RAID System Management function with advanced management and maintenance functions of RAID Systems.
   Using the two RAID System Management Modes appropriately depending on users and jobs allows the usability of the RAID System Management function to be improved and malfunctions to be avoided.

3. Supporting general functions required for configurations, operations and maintenances of RAID Systems

   The NEC ESMPRO Manager RAID System Management function supports general functions required for operations of RAID Systems (including log recording, Patrol Read and Consistency Check), and general functions required for maintenance (including Rebuild and Locate functions).

4. Troubleshooting RAID Systems

   The NEC ESMPRO Manager RAID System Management function can detect failures occurred in RAID Systems by using various functions.
   The Web GUI indicates the configurations and status of RAID Systems comprehensibly with trees and icons. The NEC ESMPRO Manager RAID System Management function registers failures occurred in RAID Systems to the dedicated log (RAID Log, Alert Viewer). Further, the Express Report Service (MG) can send alerts to the customer support contact.

Functions available on NEC ESMPRO Manager

The functions available in NEC ESMPRO Manager RAID System Management are different from those in Universal RAID Utility as shown below.

Category	Function	NEC ESMPRO Manager						Description
		Target of this document				Reference		
		HPE WBEM Provider		LSI SMI-S Provider		Universal RAID Utility		
		Standard	Advanced			Standard	Advanced	
Configuration/Status/Log information browsing	Tree View of RAID System			✓	✓	✓	✓	Shows system configuration in the component in a hierarchical manner.
	Show Property			✓	✓	✓	✓	Shows property for each component.
	Current status of operation			✓	✓	✓	✓	Shows current status of operation.
	Display information update			✓	✓	✓	✓	Refresh the RAID System information.
	RAID Log display			✓	✓	✓	✓	Displays the log of the RAID System
	Display Alert Viewer	✓	✓	✓	✓	*1	*1	Display the Alert Viewer that manages alert information sent from the RAID System.
Configuration	Easy Configuration					✓	✓	Creates RAID System easily.
	Create Logical Drive					✓	✓	Creates Logical Drive.
	Delete Logical Drive						✓	Delete Logical Drive
	Hot spare (create)			✓	✓	✓	✓	Creates Hot Spare
	Hot spare (delete)			✓	✓	✓	✓	Delete Hot Spare
	Create SSD Cache Drive						✓	Creates SSD Cache Drive
	Delete SSD Cache Drive						✓	Deletes SSD Cache Drive

Operation	Consistency Check (start)	✓	✓	✓	✓	Starts Consistency Check
	Consistency Check (stop)	✓	✓	✓	✓	Stops Consistency Check
	Scheduled Consistency Check	*2	*2	✓	✓	Starts scheduled Consistency Check
	Initialization (start)		✓		✓	Starts Consistency Check
	Initialization (stop)		✓		✓	Stops Consistency Check
	Rebuild (start)		✓		✓	Starts Consistency Check
	Rebuild (stop)		✓		✓	Stops Consistency Check
	Refresh battery		✓		✓	Refreshes battery
Maintenance	Silence buzzer	✓	✓	✓	✓	Silences buzzer
	Locate the Physical Device	✓	✓	✓	✓	Turns on (blinks) or off the disk lamp of the slot Physical Device is inserted.
	Make Physical Device Offline		✓		✓	Makes physical device offline forcibly.
	Make Physical Device Online		✓		✓	Makes physical device online forcibly.
Change settings	Option parameters of RAID Controller		✓		✓	Changes the setting of RAID Controller.
	Option parameters of Logical Drive		✓		✓	Changes the setting of Logical Drive.
Other function	Change RAID System Management Mode	*3	*3	✓	✓	Changes the RAID System Management Mode.

Legend

✓: Function supported

(No mark): Function not supported

*1: This function needs NEC ESMPRO Agent or NEC ESMPRO ServerAgentService.

*2: The user with the administrator authority or the user of whom [Remote Batch] is enabled can use the function. See the Maintenance of RAID System (Scheduled Consistency Check) section for details.

*3: You must set the RAID System management mode of NEC ESMPRO Manager RAID System Management function separately for each user. See the Registering RAID System Management function (Setting RAID System Management Mode) section for details.

Differences of RAID System management functions from old versions

From NEC ESMPRO Manager Ver.6.13 to Ver.6.20

1. Additional support of the following RAID Controllers
   - N8103-189 RAID Controller (RAID 0/1)
   - N8103-190 RAID Controller (2GB, RAID 0/1/5/6)
   - N8103-191 RAID Controller (4GB, RAID 0/1/5/6)
   - N8103-192 RAID Controller (RAID 0/1)
   - N8103-193 RAID Controller (2GB, RAID 0/1/5/6)
   - N8103-194 RAID Controller (4GB, RAID 0/1/5/6)
   - N8103-195 RAID Controller (RAID 0/1)
   - N8103-196 RAID Controller (4GB, RAID 0/1/5/6)
   - N8103-201 RAID Controller (2GB, RAID 0/1/5/6)

From NEC ESMPRO Manager Ver.6.06 to Ver.6.13

1. Additional support of management ESXi which use Native Driver (lsi_mr3).

From NEC ESMPRO Manager Ver.6.05 to Ver.6.06

1. Additional support of the following function
   - Monitoring the Endurance Remaining of SSD
     - Endurance Remaining of SSD reflects to Physical Device node.
     - The SSD which has only little Endurance Remaining cannot use to Rebuild and Hot Spare.
2. Additional support of the following RAID Controller
   - N8103-188 RAID Controller (0MB, RAID 0/1)

From NEC ESMPRO Manager Ver.6.00 to Ver.6.05

1. Additional support of the following function
   - Monitoring the Endurance Remaining of SSD
2. Additional support of the following OS
   - VMware ESXi 6

From NEC ESMPRO Manager Ver.5.72 to Ver.6.00

1. Additional support of 4K Native HDD
2. Additional support of the following RAID Controllers
   - N8103-176 RAID Controller (1GB, RAID 0/1)
   - N8103-177 RAID Controller (1GB, RAID 0/1/5/6)
   - N8103-178 RAID Controller (2GB, RAID 0/1/5/6)
   - N8103-179 RAID Controller (2GB, RAID 0/1/5/6)

From NEC ESMPRO Manager Ver.5.66 to Ver.5.72

1. Additional support of the following RAID Controllers

- N8103-172 RAID Controller (512MB, RAID 0/1)
- N8103-173 RAID Controller (512MB, RAID 0/1/5/6)
- N8103-174 RAID Controller (1GB, RAID 0/1/5/6)
- N8103-161 RAID Controller (1GB, RAID 0/1/5/6)
- N8103-168 RAID Controller (1GB, RAID 0/1/5/6)

From NEC ESMPRO Manager Ver.5.60 to Ver.5.66

1. Additional support of the following RAID Controllers
   - N8103-152 RAID Controller (1GB, RAID 0/1/5/6)
   - N8103-167 RAID Controller (1GB, RAID 0/1/5/6)
2. Additional support of Flash Backup Unit

NEC ESMPRO Manager Ver.5.60

This is the first version of NEC ESMPRO Manager that supports the management of RAID System on VMware ESXi 5 server.

Structure of NEC ESMPRO Manager RAID System Management

The NEC ESMPRO Manager RAID System Management function consists of the following modules to manage the RAID System in the server where VMware ESXi 5 or later is in operation.

- **NEC ESMPRO Manager**
  NEC ESPRO Manager is the server management software aiming at stable operation and efficient system operation of server system. It manages the configuration information of server resource and operating status, NEC ESPRO Manager manages the server using Web GUI and Alert Viewer GUI.
- **Web GUI**
  Web GUI is the application managing and monitoring the RAID System by GUI (graphical user interface). It displays the configuration and status of a RAID System graphically or provides configuration and operation for a RAID System.
- **Alert Viewer**
  Alert Viewer manages the alert information sent from the RAID System. You can check the alert information that has been sent to NEC ESMPRO Manager in the Alert Viewer on the Web browser.
- **LSI SMI-S Provider, HPE WBEM Provider**
  LSI SMI-S Provider and HPE WBEM Provider are the modules that controls the RAID System information in the server to be managed.
- **Express Report Service (MG)**
  The failure information occurred in the servers registered in NEC ESMPRO Manager can be automatically sent to the customer service by setting up Express Report Service (MG) on Management PC.

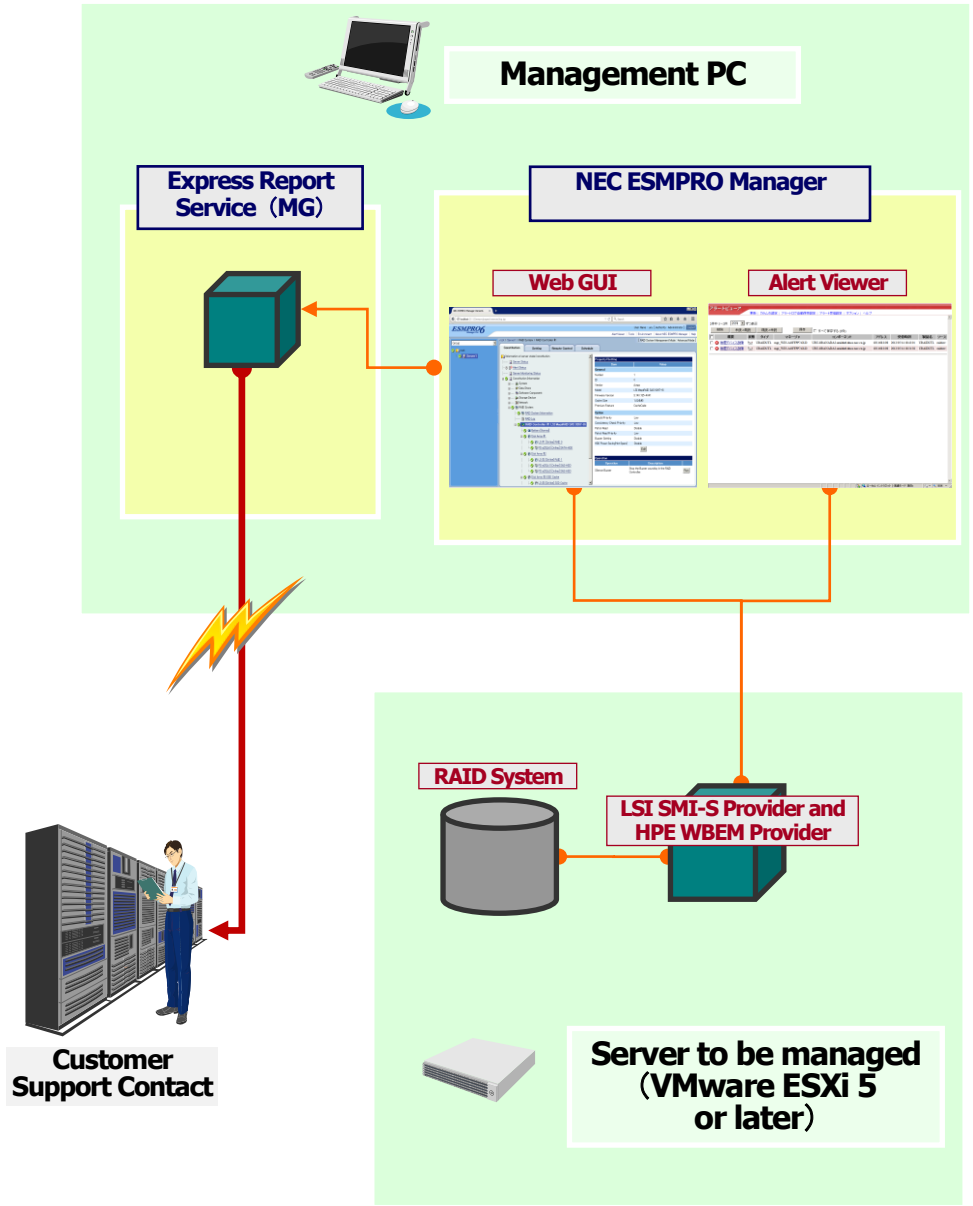


Figure 1 Configuration of RAID System Management Function

System requirements of RAID System Management function

This chapter describes system requirements of the NEC ESMPRO Manager RAID System Management function.
See NEC ESMPRO Manager Installation Guide for the system requirements of NEC ESMPRO Manager.

Server to be managed

The following components are required for the NEC ESMPRO Manager RAID System Management function.

Operating system	Installation image
Virtual platform	VMware ESXi 5.0 Update 3 Patch 08 or later VMware ESXi 5.1 Update 2 Patch 05 or later VMware ESXi 5.5 Update 2 or later VMware ESXI 6.0b or later VMware ESXI 6.5 or later
Required software	LSI SMI-S Provider and HPE WBEM Provider of the vendor of the RAID System to be managed

If the LSI SMI-S Provider and HPE WBEM Provider are not installed in a server, please download and install it from NEC Global Site.

Registering RAID System Management function

This chapter describes the registration of the NEC ESMPRO Manager RAID System Management function.

Installation of NEC ESMPRO Manager

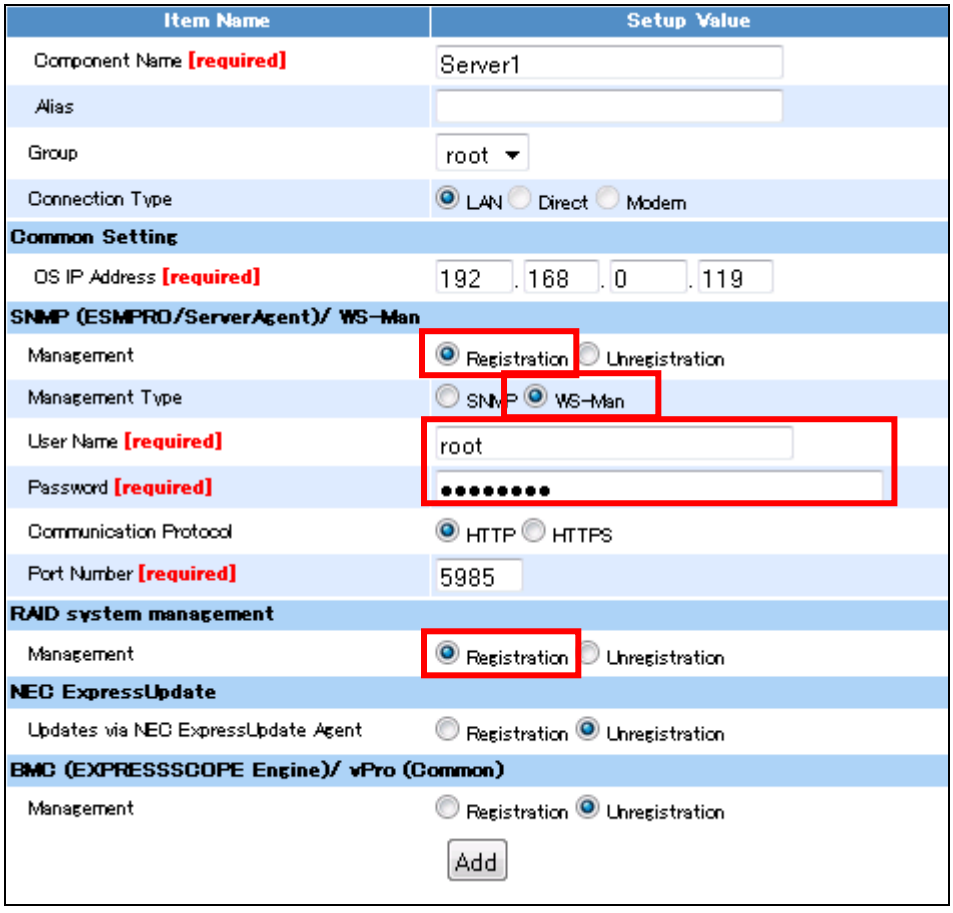
NEC ESMPRO Manager Ver5.60 or later version is required to manage the RAID System in the server where VMware ESXi 5 is in operation.

NEC ESMPRO Manager Ver6.05 or later version is required to manage the RAID System in the server where VMware ESXi 6 is in operation.

See NEC ESMPRO Manager Installation Guide for details of the installation of NEC ESMPRO Manager.

Setting the server to be managed

Set [Registration] or [Enable] for RAID System Management and WS-Man when you register the server.
See NEC ESMPRO Manager Setup Guide for details of the setting of the server to be managed.



There are two ways to register the server to be managed, “Manual Registration” and “Auto Registration.” The settings for the RAID System Management function are different for each registration as follows.

Manual Registration: Registration/Unregistration

Auto Registration: Enable/Disable

Setting RAID System Management Mode

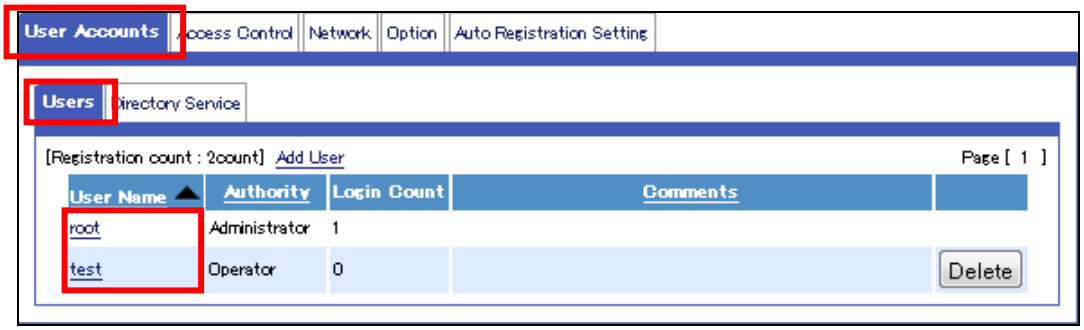
NEC ESMPRO Manager sets the RAID System Management Mode for each user account.

IMPORTANT

- **Only the user with the administrator authority can set the RAID System Management mode.**
- **The RAID System Management mode of the user with the administrator authority operates in the Advanced Mode and the settings cannot be changed.**

The procedure to set the RAID System Management mode is as follows.

Step 1 Click the [User Information] tab in [Environment Setting]. Click the user name to set the RAID System Management mode.

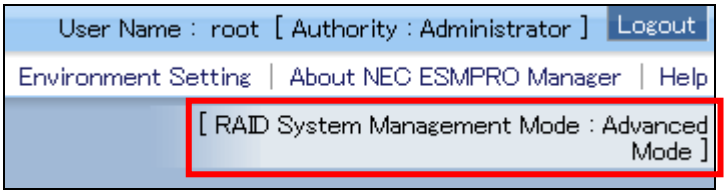


Step 2 Click [Edit].

Step 3 Check the checkbox of Advanced Mode or Standard Mode of [RAID System Management Mode] in [User Information] and click [Apply].

Checking the settings of RAID System Management mode

Check [RAID System Management Mode] displayed on the upper right of Web GUI to confirm the current settings of the RAID System Management mode.



RAID System Management mode at startup

The user with the administrator authority which has been set at the installation of NEC ESMPRO Manager starts in the Advanced Mode. The user with the operator authority starts in the RAID System Management mode which has been set at the user registration.

Functions of Web GUI

This chapter describes the functions of the Web GUI.
See the online help for details of the Web GUI.

Structure of Web GUI

As shown in the figure below, the Web GUI is composed of four parts, or Tree View, Operation Area, Menu Bar and Status Bar.

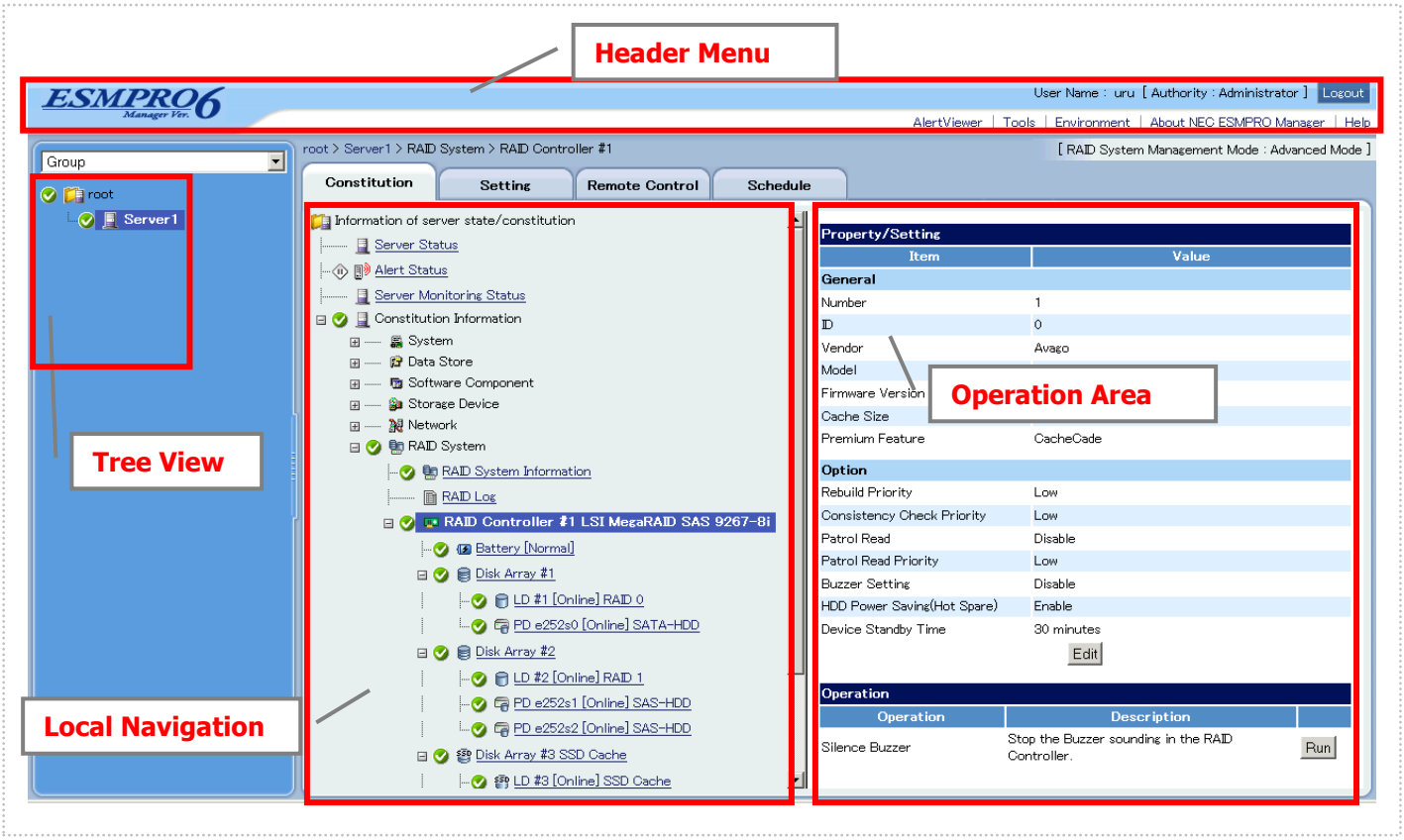


Figure 2 Structure of Web GUI

Header Menu

The Header Menu shows the name and the right of the user who currently logs in. Clicking Alert Viewer, Tools, Environmental Setting, About NEC ESMPRO Manager, Help, and Logout enables you to use each function.

Tree View

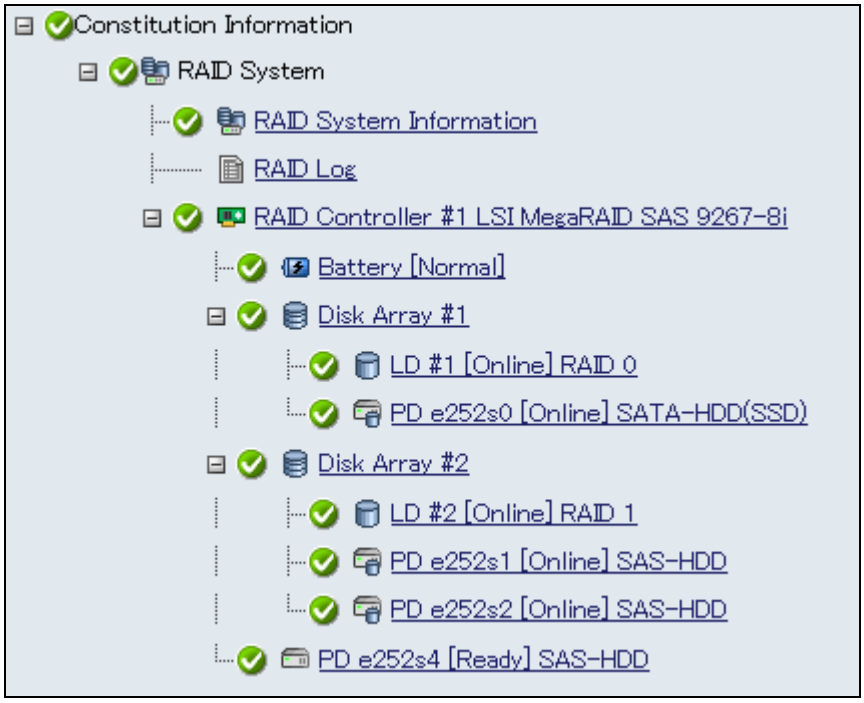
The Tree View shows the configuration of RAID Systems managed by the NEC ESMPRO Manager as a hierarchical structure.

Local Navigation

The Local Navigation shows the configuration of RAID Systems managed by the NEC ESMPRO Manager as a hierarchical structure.

The Local Navigation displays each RAID System existing in your server as a RAID Controller node.
Each RAID Controller node has the node of a Battery/ Flash Backup Unit on RAID Controller, created all Logical Drives and Disk Array and connected all Physical Devices. A single node includes at least a single component of each type.

Every component is accompanied by an icon. The icons indicate the type and the status of each component (server, RAID Controller, Battery, Flash Backup Unit, Logical Drive, and Physical Device) graphically.

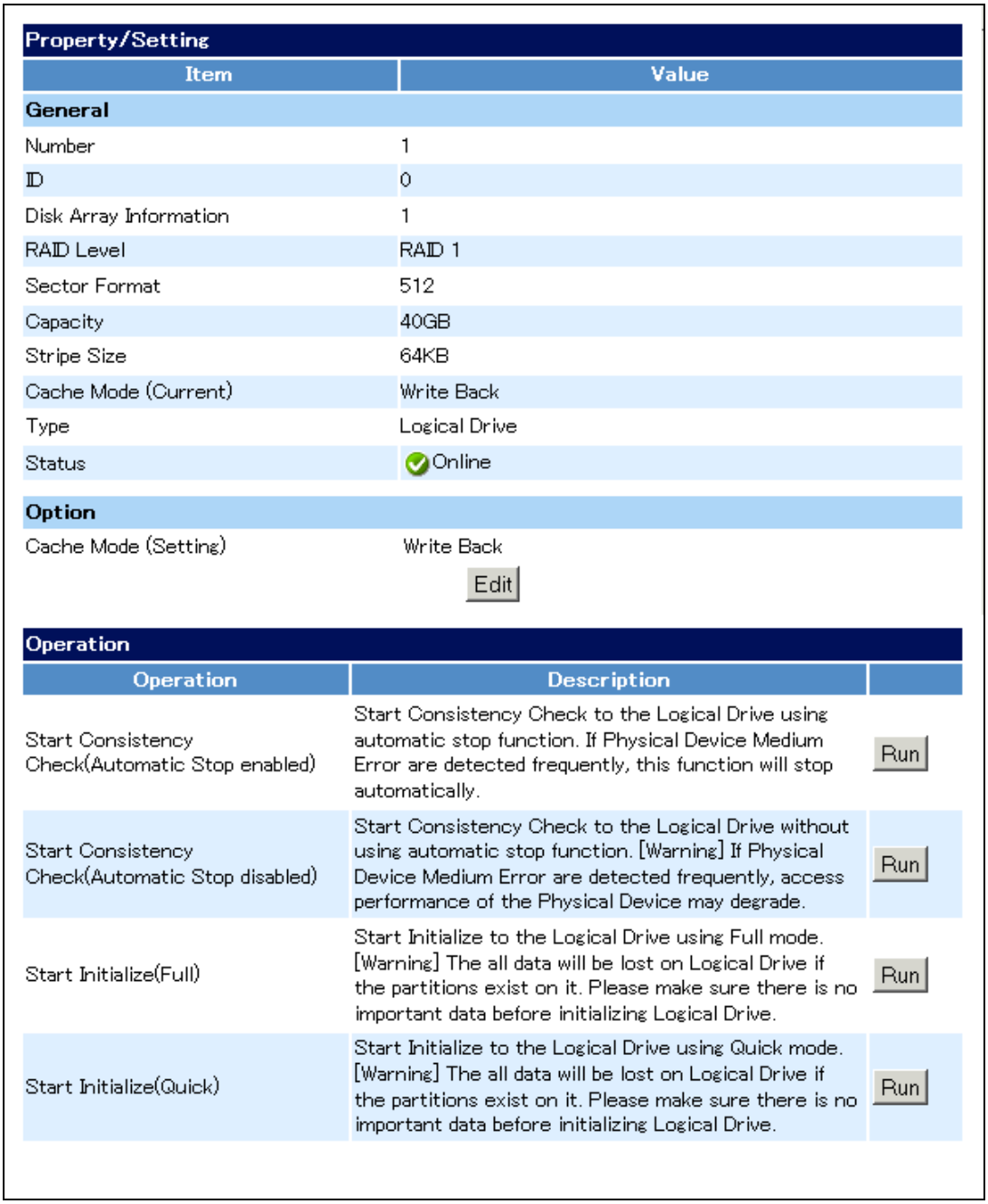


CHECK

The information can display for RAID Controller(s) which is managed with LSI SMI-S Provider. But it cannot display for RAID Controller(s) which is managed with HPE WBEM Provider. About support RAID Controllers of each provider, please refer release memo of each provider.

Operation Area

The Operation Area shows the detailed information of the component selected in the Local Navigation and the operations that you can use for each component.



Property/Setting

Item	Value
General	
Number	1
ID	0
Disk Array Information	1
RAID Level	RAID 1
Sector Format	512
Capacity	40GB
Stripe Size	64KB
Cache Mode (Current)	Write Back
Type	Logical Drive
Status	Online
Option	
Cache Mode (Setting)	Write Back Edit

Operation

Operation	Description	
Start Consistency Check(Automatic Stop enabled)	Start Consistency Check to the Logical Drive using automatic stop function. If Physical Device Medium Error are detected frequently, this function will stop automatically.	Run
Start Consistency Check(Automatic Stop disabled)	Start Consistency Check to the Logical Drive without using automatic stop function. [Warning] If Physical Device Medium Error are detected frequently, access performance of the Physical Device may degrade.	Run
Start Initialize(Full)	Start Initialize to the Logical Drive using Full mode. [Warning] The all data will be lost on Logical Drive if the partitions exist on it. Please make sure there is no important data before initializing Logical Drive.	Run
Start Initialize(Quick)	Start Initialize to the Logical Drive using Quick mode. [Warning] The all data will be lost on Logical Drive if the partitions exist on it. Please make sure there is no important data before initializing Logical Drive.	Run

Components

This chapter describes the items that compose of the Web GUI.

Server

The name of the server to be managed which has been registered in NEC ESMPRO Manager is displayed.

- [Icon] <Server name>

Item	Description
<Server name>	Indicates the name of server having the RAID System.

The server icon indicates the status of all the RAID Systems existing in the server.

Icon	Meaning	Description
	Server - Normal	All RAID Systems in the server operate normally. Problems which RAID Controllers define as failures do not occur. For RAID System which is managed with HPE WBEM Provider, only this state is indicated in spite of whether there is any Warning/ Error RAID system or not.
	Server - Warning	One or more RAID Systems in the warning condition exist in the server.
	Server - Fatal	One or more RAID Systems in the warning or fatal condition exist in the server.

RAID Controller

Each RAID System on the server is the RAID Controller node. A RAID Controller node equals a RAID Controller, and shows the number and model of the RAID Controller.

- [Icon] RAID Controller #<Number> <Model>

Item	Description
<Number>	Indicates the management number (logical address) of the RAID Controller in NEC ESMPRO Manager.
<Model>	Indicates the model name of the RAID Controller.

A RAID Controller icon indicates the status of all the RAID Systems on the RAID Controller.

Icon	Meaning	Description
	RAID Controller - Normal	All Batteries, Flash Backup Unit, Logical Drives, and Physical Devices operate normally on the RAID Controller. No failures have not been detected by the RAID Controller
	RAID Controller - Warning	One or more Batteries, Flash Backup Unit, Logical Drives, and Physical Devices in the following condition exist on the RAID Controller : "Containing one or more failed components but being operable"
	RAID Controller - Fatal	One or more Batteries, Flash Backup Unit, Logical Drives, and Physical Devices in the following condition exist in the RAID Controller : "Containing one or more failed components and being inoperable"

Battery

If the RAID Controller has the Battery, the RAID Controller node has a Battery node. A Battery node and icon shows the status of Battery.

- **[Icon] Battery [<Status>]**

Item	Description
<Status>	Indicates the status of the Battery installed in the RAID Controller.

Icon	Meaning	Description
	Battery - Normal	The Battery operates normally.
	Battery - Warning	The RAID Controller detects any problem of the Battery.

Flash Backup Unit

If the RAID Controller has the Flash Backup Unit, the RAID Controller node has a Flash Backup Unit node. A Flash Backup unit node and icon shows the status of Flash Backup Unit

- **[Icon] Flash Backup Unit [<Status>]**

Item	Description
<Status>	Indicates the status of the Flash Backup Unit installed in the RAID Controller.

Icon	Meaning	Description
	Flash Backup Unit - Normal	The Flash Backup Unit operates normally.
	Flash Backup Unit - Warning	The RAID Controller detects any problem of the Flash backup Unit.

Disk Array

If there are some Logical Drive in the RAID Controller, the RAID Controller node has the Disk Array nodes included the Logical Drives. The Disk Array node equals a Disk Array, and shows the number of the Disk Array. The Logical Drives you have created, all Physical Devices as the members of the Logical Drives, and Dedicated Hot Spares you have assigned to the Logical Drives exist in the Disk Array node.

- **[Icon] Disk Array #<Number>**

Item	Description
<Number>	Indicates the management number (logical address) of the Disk Array in NEC ESMPRO Manager.

A Disk Array icon indicates the status of the Disk Array.

Icon	Meaning	Description
	Disk Array - Normal	All the created Logical Drives, all the member Physical Devices and all the Dedicated Hot Spares operate normally. No failures have not been detected by the RAID Controller.
	Disk Array - Warning	One or more Logical Drives, Physical Devices, or Dedicated Hot Spares are in the warning condition in the Disk Array.
	Disk Array - Fatal	One or more Logical Drives, Physical Devices, or Dedicated Hot Spares are in the warning or fatal condition in the Disk Array.

SSD Cache Disk Array

When you create SSD Cache Drive in the RAID Controller, you can see that SSD Cache Disk Array node for that SSD Cache Drive is in the RAID Controller node. A single SSD Cache Disk Array node equals an SSD Cache Disk Array, and shows the number of the SSD Cache Disk Array. The SSD Cache Drive you have created, all the member Physical Devices exist in the SSD Cache Disk Array node.

- **[Icon] Disk Array #<Number> SSD Cache**

Item	Description
<Number>	Indicates the management number (logical address) of the SSD Cache Disk Array in NEC ESMPRO Manager.

An SSD Cache Disk Array icon indicates the status of SSD Cache Disk Array.

Icon	Meaning	Description
	SSD Cache Disk Array - Normal	All the SSD Cache Drives you have created, all the member Physical Devices operate normally. No failures have not been detected by the RAID Controller.
	SSD Cache Disk Array - Warning	One or more Physical Devices in the warning condition exist in the SSD Cache Disk Array.
	SSD Cache Disk Array - Fatal	One or more Physical Devices in the warning or fatal condition exist in the SSD Cache Disk Array.

Logical Drive

The Logical Drive node exists in the Disk Array node. A Logical Drive node equals a Logical Drive, and shows the number, status and RAID Level of the Logical Drive.

- **[Icon] LD #<Number> [<Status>] <RAID Level>**

Item	Description
<Number>	Indicates the management number (logical address) of the Logical Drive in NEC ESMPRO Manager. The number starts from 1.
<Status>	Indicates the status of the Logical Drive.
<RAID Level>	Indicates the RAID Level of the Logical Drive.

A Logical Drive icon indicates the status of the Logical Drive.

Icon	Meaning	Description
	Logical Drive - Normal	The Logical Drive operates normally.
	Logical Drive - Warning	Because the Logical Drive contains one or more Physical Devices with Status being Failed, the redundancy of the Logical Drive is lost or degraded.
	Logical Drive - Fatal	Because the Logical Drive contains one or more Physical Devices with Status being Failed, the Logical Drive is offline and accessing to the Logical Drive is disabled.

A RAID10/RAID50/RAID60 Logical Drive consists of more than one Disk Array according to the type of the RAID Controller. Such Logical Drive nodes are located in more than one Disk Array nodes.

SSD Cache Drive

The SSD Cache Drive node exists in the SSD Cache Disk Array node. An SSD Cache Drive node equals an SSD Cache Drive, and shows the number and status of the SSD Cache Drive.

- **[Icon] LD #<Number> [<Status>] SSD Cache**

Item	Description
<Number>	Indicates the management number (logical address) of the SSD Cache Drive in NEC ESMPRO Manager. The number starts from 1 for HDD Logical Drive and SSD Cache Drive.
<Status>	Indicates the status of the SSD Cache Drive.

An SSD Cache Drive icon indicates the status of the SSD Cache Drive.

Icon	Meaning	Description
	SSD Cache Drive - Normal	The SSD Cache Drive operates normally.
	SSD Cache Drive - Fatal	Because Status of all Physical Devices for the SSD Cache Drive is Failed, the SSD Cache Drive is offline and accessing the SSD Cache Drive is disabled.

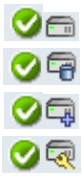
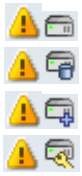
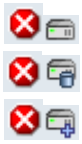
Physical Device

The Physical Device node exists in either the Disk Array node or the RAID Controller node. The Physical Device which has created the Logical Drive and created Dedicated Hot Spare exists in the Disk Array node. The other Physical Device exists in RAID Controller node. The Physical Device node equals a Physical Device, and shows the number, status, device type and power status of the Physical Device.

- [Icon] PD <Number> [<Status>] <Interface>-<Device Type>-<Power Status>

Item	Description
<Number>	Indicates the management number (logical address) of the Physical Device in NEC ESMPRO Manager in the format “eXsY” based on the location of Physical Device. X: The number of the enclosure to which the Physical Device is connected Y: The number of the slot to which the Physical Device is connected.
<Status>	Indicates the status of the Physical Device.
<Interface>	Indicates the type of the interface to which the Physical Device is connected.
<Device Type>	Indicates the type of Physical Device.
<Power Status>	Indicates the Power Status of Physical Device. Displayed only when Power Status is Power Saving or Transitioning.

A Physical Device icon indicates the device type and the status of the Physical Device.

Icon	Meaning	Description
	Physical Device - Ready	The Physical Device is not used to create a Logical Drive yet.
	Physical Device - Online	The Physical Device is already used to create a Logical Drive. Problems which the RAID Controller detects as failures do not occur.
	Physical Device - Hot Spare	The Physical Device is registered as a Hot Spare.
	Physical Device - Rebuilding	The Physical Device which is rebuilding now.
	Physical Device – Normal	The Physical Device operates without fails.
	Physical Device - Warning	The Physical Device is either which detects S.M.A.R.T. error or whose SSD Endurance Remaining is “Running out (20-11%)”, “Need to replace (10% or less)”.
	Physical Device - Fatal	The Physical Device is either which detected a failure by RAID Controller or whose SSD Endurance Remaining is “End of Life”.

A Physical Device icon indicates the power status of the Physical Device when HDD Power Saving function is enabled.

Icon	Meaning	Description
	Physical Device - Power Saving	The Physical Device which Power Status has been moved to Power Saving by the HDD Power Saving function. “ ” is placed at the lower left of the Physical Device icon.
	Physical Device - Transitioning	The Physical Device which Power Status is transitioning from Power Saving to Power On by the HDD Power Saving function. “ ” is placed at the lower left of the Physical Device icon.

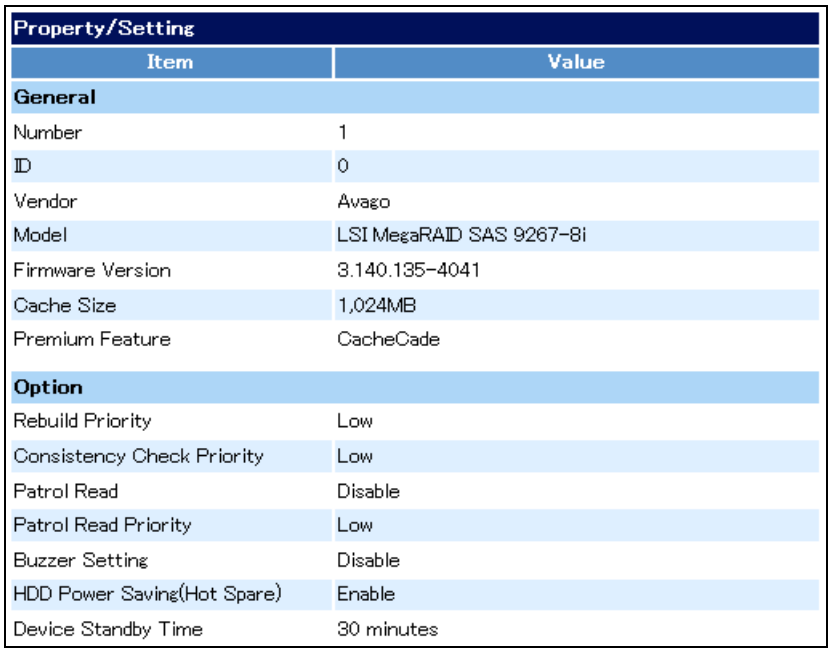
Referring to Information on RAID System

This chapter describes how to see the configurations and status of RAID Systems and the RAID System operation log.

Referring to Property of RAID Controller

For the information on a RAID Controller, see the property of the RAID Controller.

To display the property of RAID Controller, click the RAID Controller whose information is to be seen on the Local Navigation.
The [RAID Controller Properties] window has the [General] and [Option].
The [General] property indicates the property of the RAID Controller.
The [Option] property allows you to see the settings of the RAID Controller that can be changed
You can change the settings in the Advanced Mode.



Property/Setting	
Item	**Value**
General	
Number	1
ID	0
Vendor	Avago
Model	LSI MegaRAID SAS 9267-8i
Firmware Version	3.140.135-4041
Cache Size	1,024MB
Premium Feature	CacheCade
Option	
Rebuild Priority	Low
Consistency Check Priority	Low
Patrol Read	Disable
Patrol Read Priority	Low
Buzzer Setting	Disable
HDD Power Saving(Hot Spare)	Enable
Device Standby Time	30 minutes

Item	Description
Number	Indicates the management number (logical address) of the RAID Controller in NEC ESMPRO Manager. The number starts from 1 for each RAID Controller.
ID	Indicates the original identification value of the RAID Controller. The Offline utility of the RAID Controller uses the address of the identification value.
Vendor	Indicates the vendor of the RAID Controller.
Model	Indicates the model name of the RAID Controller.
Firmware Version	Indicates the version of the RAID Controller.
Cache Size	Indicates the size of cache on RAID Controller in MB.
Premium Feature	Indicates the Premium Feature of RAID Controller. Displayed only when Premium Feature is enable. The possible status is as follow: Cache Cade: the function to create the SSD Cache Drive using Solid State Drive(s) (SSD) and use SSD as the Cache of Logical Drive.

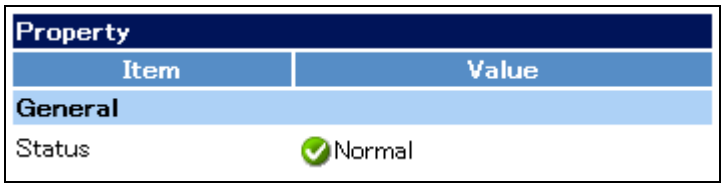
Item	Description
Rebuild Priority	Indicates the priority level of Rebuild executed in the server system. Three possible Rebuild Priorities are as follows: High: Executes Rebuild at high priority. Middle: Executes Rebuild at balanced priority. Low: Executes Rebuild at low priority.
Consistency Check Priority	Indicates the priority level of Consistency Check executed in the server system. Three possible Consistency Check Priorities are as follows: High: Executes Consistency Check at high priority. Middle: Executes Consistency Check at balanced priority. Low: Executes Consistency Check at low priority.
Patrol Read	Indicates whether Patrol Read is executed or not. Enable: Executes Patrol Read. Disable: Does not execute Patrol Read.
Patrol Read Priority	Indicates the priority level of Patrol Read executed in the server system. Three possible Patrol Read Priorities are as follows: High: Executes Patrol Read at high priority. Middle: Executes Patrol Read at balanced priority. Low: Executes Patrol Read at low priority.
Buzzer Setting	Indicates whether the Buzzer of the RAID Controller is used if a failure occurs in the RAID System. Enable: Enables the Buzzer. Disable: Disables the Buzzer.
HDD Power Saving (Hot Spare)	Indicates whether the HDD Power Saving (Hot Spare) is enabled or not. Enable; Spin down the Hot Spare that is not in use. Disable: Does not spin down the Hot Spare that is not in use.
Device Standby Time	Indicates the time of transitioning to Power Saving of the Physical Device which is not in use. 30 minutes 1 hour 2 hours 4 hours 8 hours

The items displayed in the property of the RAID Controller differ depending on the RAID Controller. The items which are not supported appear as blank or do not appear on the list.

Referring to Property of Battery

For the information on a Battery on RAID Controller, see the property of the Battery.

To display the property of Battery, click the Battery whose information is to be seen on the Local Navigation.
The [General] property indicates the property of the Battery.

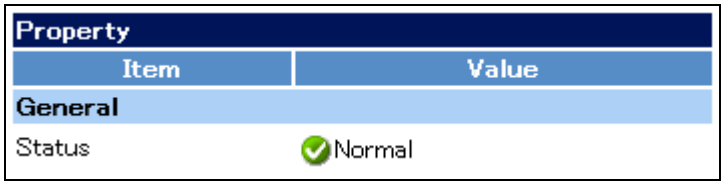


Item	Description
Status	Indicates the status of the Battery installed in the RAID Controller. Two possible statuses are as follows: Normal: Indicates that the Battery can be used normally. Warning: Indicates that the Battery cannot be used normally due to some reason.

Referring to Property of Flash Backup Unit

For the information on a Flash Backup Unit on RAID Controller, see the property of the Flash Backup Unit.

To display the property of Flash Backup Unit, click the Flash Backup Unit whose information is to be seen on the Local Navigation.
The [General] property indicates the property of the Flash Backup Unit.



Item	Description
Status	Indicates the status of the Flash Backup Unit installed in the RAID Controller. Two possible statuses are as follows: Normal: Indicates that the Flash Backup Unit can be used normally. Warning: Indicates that the Flash Backup Unit cannot be used normally due to some reason.

Referring to Property of Disk Array

For the information on a Disk Array, see the property of the Disk Array.

To display the property, click the Disk Array whose information is to be seen on the Local Navigation.
The [General] tab indicates the property of the Disk Array.

Property

Item	Value
General	
Number	1
ID	0
Sector Format	512
Capacity	297GB
Unused Capacity	217GB
Type	Disk Array
Physical Device 1	e252s0
Physical Device 2	e252s1

Item	Description
Number	Indicates the management number (logical address) of the Disk Array in NEC ESMRPO Manager. The number starts from 1, which includes Disk Array as well as SSD Cache Disk Array.
ID	Indicates the original identification value of the Disk Array. Use this value to create Disk Array managed by the Offline utility of the RAID Controller corresponding to those managed by NEC ESMPRO Manager.
Sector Format	Indicates sector format of Physical Device in the Disk Array.
Capacity	Indicates the total capacity of Physical Device in Disk Array in GB.
Unused Capacity	Indicates the capacity of unused area in the Disk Array in GB.
Type	Indicates the Type of Disk Array. Indicates [Disk Array] or [SSD Cache Disk Array].
Physical Device N	Indicates the number of the Physical Devices which are the members of Disk Array. N starts from 1, corresponding to the number of Physical Device which composes the Disk Array. When the number of Physical Device is one, N is not displayed.

The items displayed in the property of the Disk Array differ depending on the RAID Controller. The items which are not supported appear as blank or do not appear on the list.

Referring to Property of SSD Cache Disk Array

For the information on an SSD Cache Disk Array, see the property of the SSD Cache Disk Array.

To display the property, click the SSD Cache Disk Array whose information is to be seen on the Local Navigation.
The [General] tab indicates the property of the SSD Cache Disk Array.

Property

Item	Value
General	
Number	3
ID	2
Sector Format	512
Capacity	185GB
Unused Capacity	0GB
Type	SSD Cache Disk Array
Physical Device 1	e252s6
Physical Device 2	e252s7

Item	Description
Number	Indicates the management number (logical address) of the SSD Cache Disk Array in the NEC ESMRPO Manager. The number starts from 1, which includes Disk Array as well as SSD Cache Disk Array.
ID	Indicates the original identification value of the SSD Cache Disk Array. Use this value to create SSD Cache Disk Array managed by the Offline utility of the RAID Controller corresponding to those managed by NEC ESMPRO Manager.
Sector Format	Indicates sector format of Physical Device in the SSD Cache Disk Array.
Capacity	Indicates the total capacity of Physical Device in SSD Cache Disk Array in GB.
Unused Capacity	Indicates the capacity of unused area in the SSD Cache Disk Array in GB.
Type	Indicates the Type of SSD Cache Disk Array. Indicates [Disk Array] or [SSD Cache Disk Array].
Physical Device N	Indicates the number of the Physical Devices which are the members of SSD Cache Disk Array. N starts from 1, corresponding to the number of Physical Device which composes the Disk Array. When the number of Physical Device is one, N is not displayed.

The items displayed in the property of the SSD Cache Disk Array differ depending on the RAID Controller. The items which are not supported appear as blank or do not appear on the list.

Referring to Property of Logical Drive

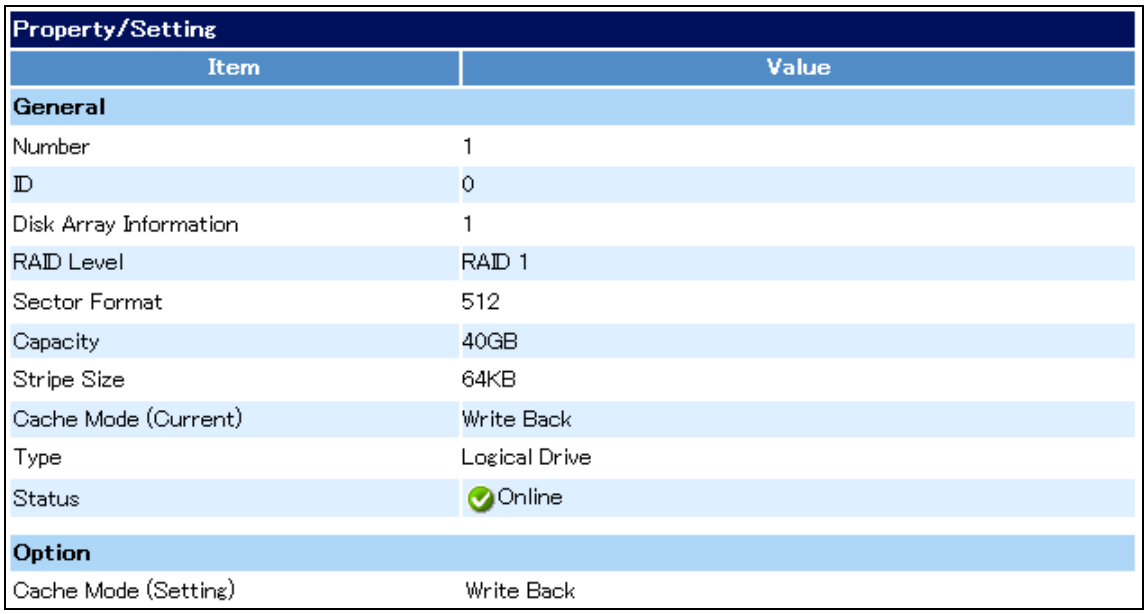
For the information on a Logical Drive, see the property of the Logical Drive.

To display the property of Logical Drive, click the Logical Drive whose information is to be seen on the Local Navigation.

The [Logical Drive Properties] window contains the [General] and [Option].

The [General] property indicates the property of the Logical Drive.

The [Option] tab allows you to see the settings of the Logical Drive.
You can change the settings in the Advanced Mode.



Property/Setting	
Item	**Value**
General	
Number	1
ID	0
Disk Array Information	1
RAID Level	RAID 1
Sector Format	512
Capacity	40GB
Stripe Size	64KB
Cache Mode (Current)	Write Back
Type	Logical Drive
Status	Online
Option	
Cache Mode (Setting)	Write Back

Item	Description
Number	Indicates the management number (logical address) of the Logical Drive in NEC ESMPRO Manager. The Universal RAID Utility assigns a number starting from 1, which includes SSD Cache Drive as well as Logical Drive.
ID	Indicates the original identification value of the Logical Drive. Use this value to create Logical Drives managed by the Offline utility of the RAID Controller correspond with those managed by NEC ESMPRO Manager.
Disk Array Information	Indicates the management number (logical address) of the Disk Array in which the Logical Drive exists.
RAID Level	Indicates the RAID Level of the Logical Drive. The value can be RAID 0, RAID 1, RAID 5, RAID 6, RAID 00, RAID 10, RAID 1E, RAID 50 or RAID 60.
Sector Format	Indicates sector format of Physical Device in the Logical Drive.
Capacity	Indicates the capacity of the Logical Drive in GB.
Stripe Size	Indicates the Stripe Size of the Logical Drive. The value can be 1KB, 2KB, 4KB, 8KB, 16KB, 32KB, 64KB, 128KB, 256KB, 512KB, or 1024KB.

Item	Description
Cache Mode (Current)	Indicates the current value of the mode of writing data to the cache memory installed in the RAID Controller. Two possible modes are as follows: Write Back: Writes data to the cache memory asynchronously. Write Through: Writes data to the cache memory synchronously.
Type	Type of the Logical Drive. Indicates Logical Drive or SSD Cache Drive.
Status	Indicates the status of the Logical Drive. Three possible status are as follows: Online: Indicates that the redundancy of the Logical Drive is retained. Degraded: Indicates that the redundancy of the Logical Drive is lost or degraded. Accessing to the Logical Drive is enabled. Offline: Indicates that the Logical Drive is offline and accessing to the Logical Drive is disabled.
Cache Mode (Setting)	Indicates the mode of writing data to the cache memory installed in the RAID Controller. Three possible modes are as follows: Auto Switch: Switches the mode automatically between Write Back and Write Through depending on the existence and/or status of Battery and Flash Backup Unit. Write Back: Writes data to the cache memory asynchronously. Write Through: Writes data to the cache memory synchronously.

- Each RAID Controller supports specific RAID Levels and Stripe Sizes. Unsupported items indicate space or do not appear in the list.
- Each RAID Controller supports specific Cache Modes. Unsupported Cache Modes do not appear.
- Each RAID Controller supports specific items appearing on the Property tab of the Logical Drive and specific items whose settings can be changed. Unsupported items indicate space or do not appear in the list.

The status of a Logical Drive is defined depending on the RAID Level and the number of Physical Devices failed.

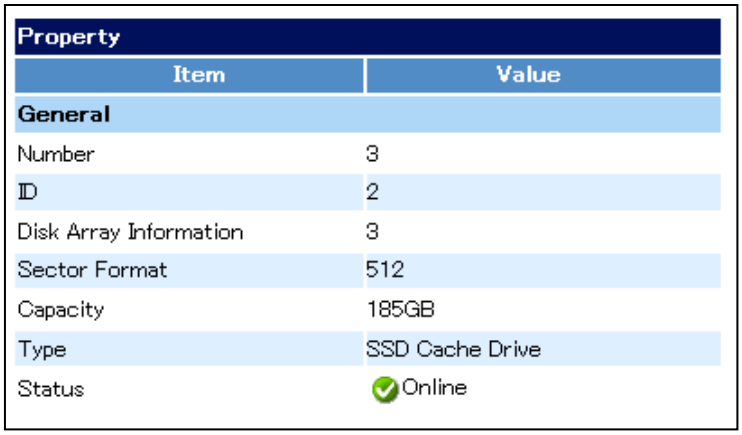
If the RAID Level is RAID 10 or RAID 50 and two Physical Devices (three or four for RAID60) are failed, the status will be [Degraded] or [Offline] depending on the failed Physical Devices.

RAID level	Number of failed Physical Devices			
	0	1	2	3 or more
RAID 0	Online	Offline	Offline	Offline
RAID 1	Online	Degraded	Offline	-
RAID 5	Online	Degraded	Offline	Offline
RAID 6	Online	Degraded	Degraded	Offline
RAID 10	Online	Degraded	Degraded/Offline	Offline
RAID 50	Online	Degraded	Degraded/Offline	Offline
RAID 60	Online	Degraded	Degraded	Degraded/Offline (5 or more : Offline)

Referring to Property of SSD Cache Drive

For the information on an SSD Cache Drive, see the property of the SSD Cache Drive.

To display the property of SSD Cache Drive, click the SSD Cache Drive whose information is to be seen on the Local Navigation.
The [General] property indicates the property of the SSD Cache Drive.



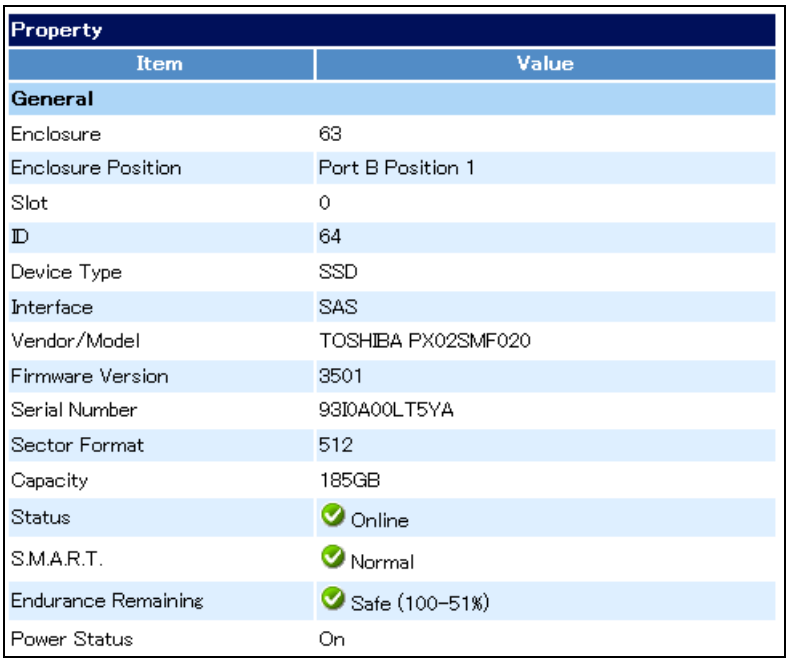
Property	
Item	**Value**
General	
Number	3
ID	2
Disk Array Information	3
Sector Format	512
Capacity	185GB
Type	SSD Cache Drive
Status	Online

Item	Description
Number	Indicates the management number (logical address) of the SSD Cache Drive in NEC ESMPRO Manager. The Universal RAID Utility assigns a number starting from 1, which includes SSD Cache Drive as well as Logical Drive.
ID	Indicates the original identification value of the SSD Cache Drive. Use this value to create SSD Cache Drive managed by the Offline utility of the RAID Controller correspond with those managed by NEC ESMPRO Manager.
Disk Array Information	Indicates the management number (logical address) of the Disk Array in which the SSD Cache Drive exists.
Sector Format	Indicates sector format of Physical Device in the SSD Cache Drive.
Capacity	Indicates the capacity of the SSD Cache Drive in GB.
Type	Type of the SSD Cache Drive. Indicates Logical Drive or SSD Cache Drive.
Status	Indicates the status of the SSD Cache Drive. The possible statuses are as follows: Online: Indicates that the redundancy of the SSD Cache Drive is retained. Offline: Indicates that the SSD Cache Drive is offline and accessing to the SSD Cache Drive is disabled.

Referring to Property of Physical Device

For the information on a Physical Device, see the property of the Physical Device.

To display the property of Physical Device, click the Physical Device whose information is to be seen on the Local Navigation.
The [General] property indicates the property of the Physical Device.



Property	
Item	**Value**
General	
Enclosure	63
Enclosure Position	Port B Position 1
Slot	0
ID	64
Device Type	SSD
Interface	SAS
Vendor/Model	TOSHIBA PX02SMF020
Firmware Version	3501
Serial Number	93I0A00LT5YA
Sector Format	512
Capacity	185GB
Status	Online
S.M.A.R.T.	Normal
Endurance Remaining	Safe (100-51%)
Power Status	On

Item	Description
Enclosure	Indicates the number of Enclosure inserted Physical Device. This value is the original identification value of Enclosure.
Enclosure Position	Indicates the location where Enclosure in which Physical Device is inserted is connected. Either of the following values is displayed. Internal Port[Port Number] Position[Position]
Slot	Indicates the number of Slot inserted Physical Device. This value is a number starting from 0 or 1.
ID	Indicates the original identification value of the Physical Device. Use this value to match Physical Devices managed by the Offline utility of the RAID Controller and those managed by NEC ESMPRO Manager. The format of the ID varies depending on the types of RAID Controllers.
Device Type	Indicates the type of Physical Device. The possible types are as follows: HDD : Hard Disk Drive SSD : Solid State Drive
Interface	Indicates the type of the interface to which the Physical Device is connected. Two possible types are as follows: SAS : Serial Attached SCSI SATA : Serial ATA
Vendor/Model	Indicates the vendor and model name of the Physical Device.
Firmware Version	Indicates the version of the Physical Device.
Serial Number	Indicates the serial number of the Physical Device. This item is indicated when Device Type item is HDD or SSD.

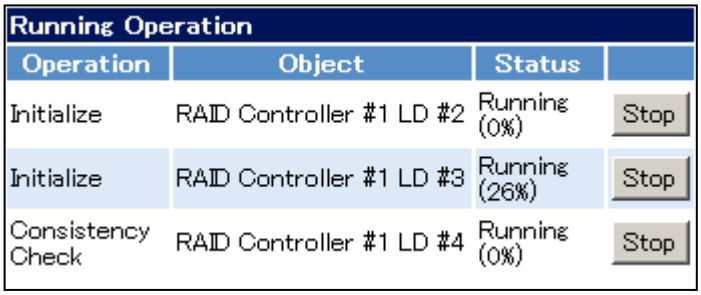
Item	Description
Sector Format	Indicates sector format of the Physical Device.
Capacity	Indicates the capacity of the Physical Device in GB. This item is indicated when Device Type item is HDD or SSD.
Status	Indicates the status of the Physical Device. Five possible status are as follows: Online: Indicates that the Physical Device is incorporated into a Logical Drive to operate normally. Failed: Indicates that the Physical Device is incorporated. Rebuilding: Indicates that the Physical Device is rebuilding. Hot Spare: Indicates that the Physical Device is set as a Hot Spare. Ready: Indicates that the Physical Device is not incorporated into a Logical Drive. This item is indicated when Device Type item is HDD or SSD.
Hot Spare Information	Indicates the Hot Spare mode of the Physical Device if it is specified as a Hot Spare. Two possible modes are as follows: Global: The Physical Device can be used as a Hot Spare of any Disk Array in the RAID Controller. Dedicated(Disk Array #X): The Physical Device can be used as a Hot Spare of the specified Disk Array. Also indicates the number of the specified Disk Array. X indicates the management number (logical address) of the Disk Array for which the hot spare is created. This item is displayed only when Status is Hot Spare.
S.M.A.R.T.	Indicates the diagnosis result of S.M.A.R.T.(Self-Monitoring, Analysis and Reporting Technology) function. Two possible statuses are as follows. Normal: Does not detect any error caused by the S.M.A.R.T. function. Detected: Detects one or more errors caused by the S.M.A.R.T. function. This item is indicated when Device Type item is HDD or SSD.
Endurance Remaining	Indicates the Endurance Remaining of SSD. The possible conditions are as follows. Safe (100-51%): the Endurance Remaining is Safe (100-51%). Reducing (50-21%): the Endurance Remaining is Reducing (50-21%). Running out (20-11%): the Endurance Remaining is Running out (20-11%). Need to replace (10% or less): the Endurance Remaining is Need to replace (10% or less). End of Life: the Endurance Remaining is End of Life.
Power Status	Indicates the Power Status of Physical Device. This item is displayed only in the Power Saving or Transitioning Status. The possible conditions are as follows. On : Power Status is active. Power Saving : Power Status is Power Saving. Transitioning : Power Status is transitioning from Power Saving to active.

- Each RAID Controller supports specific items appearing on the Property tab of the Physical Device and specific items whose settings can be changed. Unsupported items indicate space or do not appear in the list.
- Even if Physical Device does not break down when you execute Make Offline, [Status] item is changed to [Failed].

Browsing or Stopping Execution Status of Operation

NEC ESMPRO Manager allows you to browse or stop the status of the operation currently running in the RAID System.

To browse the status of operation, click [RAID System Information] in the Local Navigation. You can browse the status of the operation currently running. In [Running Operation].
To stop the running operation, click [Stop] to stop the operation in [Running Operation].
You can also browse or stop the status of the operation in the Logical Drive or Physical Device window.



CHECK

- The operation that can be stopped depends on the RAID System Management Mode. For details, see the section “Functions available on NEC ESMPRO Manager” in “Overview”.
- Some RAID Controllers do not support stopping an operation. In this case, the “Stop” button is disabled.

TIPS

The progress of the running operation may not be displayed accurately when the progress is updated very frequently, for example, when a logical drive with small capacity is been initialized. In this case, perform [Rescan] in [RAID System Information] in the Local Navigation to display the correct progress.

Updating Information of RAID System

The management information of RAID System managed by NEC ESMPRO Manager is obtained at the following timings:

- Starting (Restarting) the operating system of the management PC in which NEC ESMPRO Manager has been installed
- Starting (Restarting) the server to be managed
- Receiving an event such as change of RAID System status or change of execution status of an operation having occurred
- Recovering from the communication disconnection between the management PC and the server to be managed for any reason

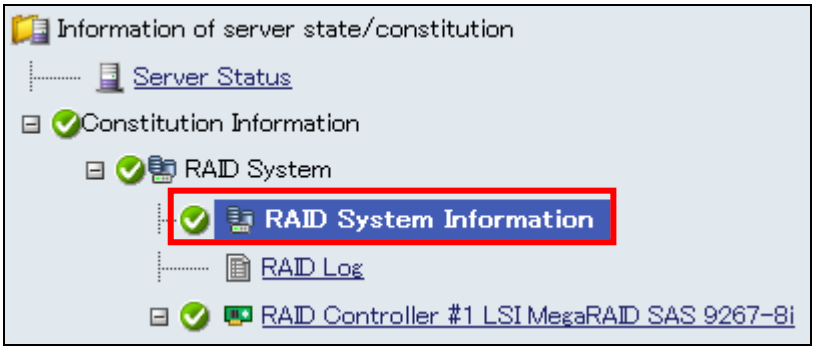
To update the management information of the RAID System to the latest one, obtain the information of the RAID System again in the following procedure.

TIPS

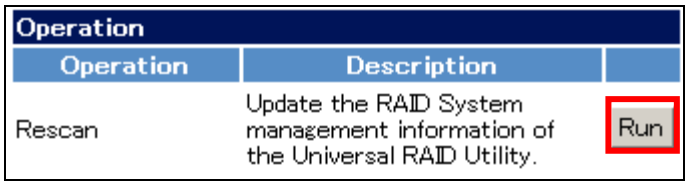
It takes several minutes after a symptom such as the status change of the RAID System or the status change of the running operation occurs and the screen is automatically rescanned.

The procedure to update the RAID System information to the latest status is as follows.

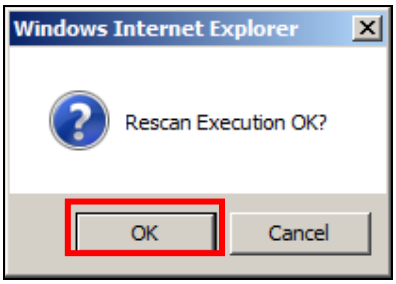
Step 1 Click [RAID System Information] in the Local Navigation.



Step 2 Click [Run] in the [Rescan] operation in [Operation].



Step 3 The .dialog confirming the Rescanning will be displayed. Click [OK].



Referring to RAID System Operation Log

Operations done for RAID Systems and events occurred in the RAID Systems are registered to the RAID Log of NEC ESMPRO Manager. Much important events are registered also in the Alert Viewer.

CHECK

NEC ESMPRO Manager registers RAID Log and Alert Viewer for RAID System which is managed with LSI SMI-S Provider.

However, for HPE WBEM Provider, NEC ESMPRO Manager only registers Alert Viewer.

RAID Log

The RAID Log shows the operation log of the RAID System.
The following information is included in the RAID Log.

Item	Description
Type	There are following levels of severity. Error: A fatal error occurs. Warning: An event which is not fatal but noteworthy occurs Information: An event just to notify of the information
Date/Time	Date and time when the event occurs
ID	Event ID of the log
Description	The content of the log

Referencing RAID Log

Click [RAID Log] in the Local Navigation to browse the RAID Log.

Updating RAID Log

Click [Update of display log] on the RAID Log screen to obtain the RAID Log again

[Registration count : 10count] Update of display log Page [1]

Type	Date/Time	ID	Description
Information	2012/07/18 14:03:26 (+09:00)	401	<RU0401> [CTRL:1(ID=0) LD:2(ID=1)] Logical Drive is Online.
Information	2012/07/18 14:03:26 (+09:00)	301	<RU0301> [CTRL:1(ID=0) PD:e252s1 (ID=114) SEAGATE ST9300603SS N006] Physical Device is Online.
Information	2012/07/18 14:03:26 (+09:00)	307	<RU0307> [CTRL:1(ID=0) PD:e252s1 (ID=11[illegible]) SEAGATE ST9300603SS N006] Rebuild completed.
Information	2012/07/18 13:56:22 (+09:00)	210	<RU0210> [CTRL:1(ID=0)] Patrol Read completed.
Information	2012/07/18 13:56:22 (+09:00)	306	<RU0306> [CTRL:1(ID=0) PD:e252s1 (ID=114) SEAGATE ST9300603SS N006] Rebuild was started.
Information	2012/07/18 13:56:22 (+09:00)	302	<RU0302> [CTRL:1(ID=0) PD:e252s4 (ID=115) SEAGATE ST9300603SS N006] Physical Device is Ready.
Warning	2012/07/18 13:56:22 (+09:00)	402	<RU0402> [CTRL:1(ID=0) LD:2(ID=1)] Logical Drive is Degraded.
Error	2012/07/18 13:56:22 (+09:00)	304	<RU0304> [CTRL:1(ID=0) PD:e252s4 (ID=115) SEAGATE ST9300603SS N006] Physical Device is Failed.
Information	2012/07/18 13:55:18 (+09:00)	303	<RU0303> [CTRL:1(ID=0) PD:e252s1 (ID=114) SEAGATE ST9300603SS N006] Physical Device is Hot Spare.
Information	2012/07/18 13:55:18 (+09:00)	313	<RU0313> [CTRL:1(ID=0) PD:e252s1 (ID=114) SEAGATE ST9300603SS N006] Global Hot Spare created.

Alert Viewer

The Alert Viewer shows the alert information sent from the RAID System in table form.
The following information is included in the Alert Viewer.

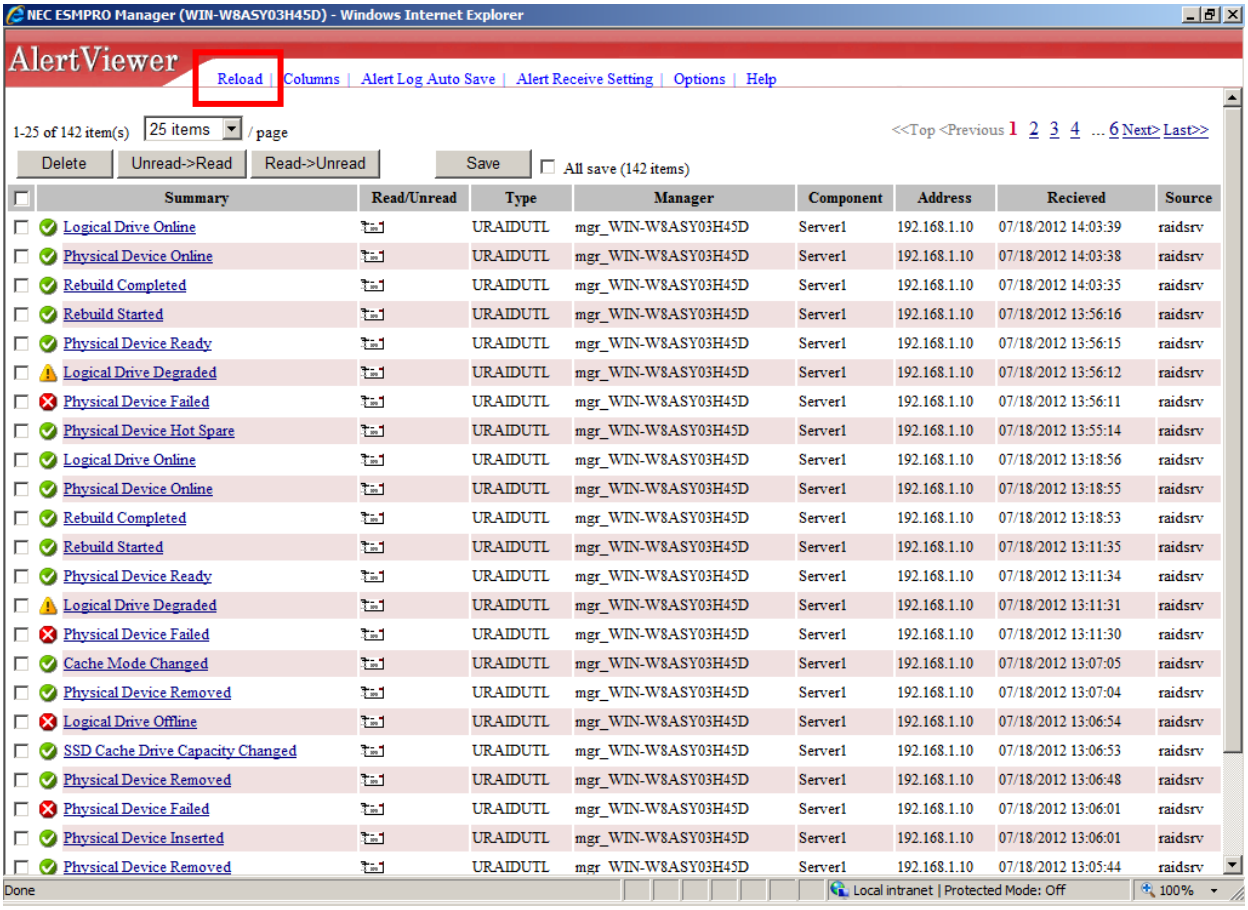
Item	Description
Checkbox	Check the checkbox for each alert to select. Check the checkbox in the header of the list to select all the alerts displayed in the current page. Uncheck it to deselect all the alerts displayed in the current page.
Summary	This item gives a brief description of the alert message. The icon in the left indicates the severity of the event.  Information  Minor (Warning)  Major (Error)  Unknown
Read/Unread	This indicates if the details of the alert message have been reviewed on the Alert Detail screen.  Unread  Read
Type	This item shows the type of the alert including CPU, Memory, and Network. [URAIDUTL] is displayed for the alerts regarding the RAID System.
Manager	This item displays the name of the Manager on Web GUI to which the component belongs.
Component	The name of the component that the alert occurs. [Unknown server] will be displayed if an alert is notified from the component which has not been registered in NEC ESMPRO Manager.
Address	IP address of the component
Received	Date and time when the alert is received
Source	The service that sent the alert. [raidsrv] is displayed for the alerts regarding the RAID System.
Event ID	Event ID of the alert.
Severity	Severity of the alert.
Generated	The date and time of the alert is generated.

Referencing Alert Viewer

Click [Alert Viewer] in the Header Menu to browse the AlertViewer.

Updating AlertViewer

Click [Reload] on the Header Menu of Alert Viewer to refresh the Alert list



Changing Property and Running Operation in RAID System

This chapter describes the properties that can be changed and available operations in NEC ESMRPO Manager RAID Management function.
You can change the properties or run the operations on the Operation Area. Click the target component in the Local Navigation to display the Operation Area.

- Changing the property
  Change the property in [Property/Setting] in the Operation Area. This can be done for RAID Controller and Logical Drive.
- Running the operation
  Run the operation in [Operation] in the Operation Area. This can be done for RAID Controller, Battery, Logical Drive, and Physical Device.

Some functions in the Operation Area are disabled depending on the type of the component selected and the status of the component.

When the RAID System Management Mode of NEC ESMPRO Manager is the Standard Mode, the functions that are not available in the mode will not be displayed.

For the detailed description for changing the properties and running operations of RAID System properties, see "Maintenance of RAID System"

Changing the propeties of RAID System

This section describes the properties that can be changed for each component in the Operation Area.

Properties of RAID Controller that can be changed

Item	Description
Rebuild Priority	Indicates the priority level of Rebuild executed in the server system. Three possible Rebuild Priorities are as follows: High: Executes Rebuild at high priority. Middle: Executes Rebuild at balanced priority. Low: Executes Rebuild at low priority.
Consistency Check Priority	Indicates the priority level of Consistency Check executed in the server system. Three possible Consistency Check Priorities are as follows: High: Executes Consistency Check at high priority. Middle: Executes Consistency Check at balanced priority. Low: Executes Consistency Check at low priority.
Patrol Read	Indicates whether Patrol Read is executed or not. Enable: Executes Patrol Read. Disable: Does not execute Patrol Read.

Item	Description
Patrol Read Priority	Indicates the priority level of Patrol Read executed in the server system. Three possible Patrol Read Priorities are as follows: High: Executes Patrol Read at high priority. Middle: Executes Patrol Read at balanced priority. Low: Executes Patrol Read at low priority.
Buzzer Setting	Indicates whether the Buzzer of the RAID Controller is used if a failure occurs in the RAID System. Enable: Enables the Buzzer. Disable: Disables the Buzzer.
HDD Power Saving (Hot Spare)	Indicates whether the HDD Power Saving (Hot Spare) is enabled or not. Enable; Spin down the Hot Spare that is not in use. Disable: Does not spin down the Hot Spare that is not in use.
Device Standby Time	Indicates the time of transitioning to Power Saving of the Physical Device which is not in use. 30 minutes 1 hour 2 hours 4 hours 8 hours

Properties of Logical Drive that can be changed

Item	Description
Cache Mode (Setting)	Indicates the mode of writing data to the cache memory installed in the RAID Controller. Three possible modes are as follows: Auto Switch: Switches the mode automatically between Write Back and Write Through depending on the existence and/or status of Battery and Flash Backup Unit. Write Back: Writes data to the cache memory asynchronously. Write Through: Writes data to the cache memory synchronously.

Running Operations of RAID System

This section describes the operations that can be run for each component in the Operation Area.

Operations of RAID Controller that can be run

Item	Description
Silence Buzzer	Silences the buzzer of the RAID Controller

Operations of Battery that can be run

Item	Description
Refresh Battery	Starts refreshing the battery.

Operations of Logical Drive that can be run

Item	Description
Start Consistency Check (Automatic Stop enabled)	Executes Consistency Check (Automatic Stop enabled) for the selected Logical Drive. In the Automatic Stop enabled mode, Consistency Check is stopped automatically when a medium error was detected frequently on an identical Physical Device.
Start Consistency Check (Automatic Stop disabled)	Executes Consistency Check (Automatic Stop disabled) for the selected Logical Drive. In the Automatic Stop disabled mode, Consistency Check keeps being executed until execution is completed when a medium error was detected frequently on an identical Physical Device.
Stop Consistency Check	Stops running Consistency Check.
Start Initialize (Full)	Initializes the selected Logical Drive. This operation completely initializes the content of the Logical Drive by writing 0 all over the Logical Drive.
Start Initialize (Quick)	Initializes the selected Logical Drive. This operation initializes only several leading blocks including the information on managing a Logical Drive, by writing 0 in these blocks.
Stop Initialize	Stops initialization.

Operations of Physical Device that can be run

Item	Description
Start Rebuild	Rebuilds the selected Physical Device.
Stop Rebuild	Stops rebuilding the Physical Device.
Create Global Hot Spare	Creates Global Hot Spare.
Create Dedicated Hot Spare	Creates Dedicated Hot Spare by specifying a Physical Device.
Remove Hot Spare	Removes Hot Spare
Make Online	Makes a Physical Device Online. It causes the loss of consistency if a Logical Drive has been created by using the Physical Device.
Make Offline	Makes a Physical Device Offline. It causes the loss of redundancy if a Logical Drive has been created by using the Physical Device.
Locate On	Turns on (or blinks) the lamp on the slot where the selected Physical Device is installed.
Locate Off	Turns off the lamp on the slot where the selected Physical Device is installed.

Maintenance of RAID System

This chapter describes the maintenance of a RAID System using NEC ESMPRO Manager.

Providing Patrol Read for Physical Devices

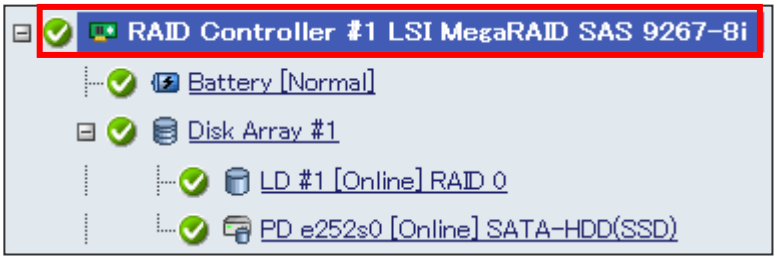
The Patrol Read function reads data saved in all Physical Devices in a RAID System entirely to check whether a read error occurs or not regularly in the background. The Patrol Read is effective to find failures including Physical Device medium error early. Be sure to execute Patrol Read for a RAID Controller if it supports the Patrol Read.
NEC ESMPRO Manager provides the function of indicating whether Patrol Read is executed or not and the function of changing the Patrol Read Priority.

Setting Whether Patrol Read Is Executed or Not

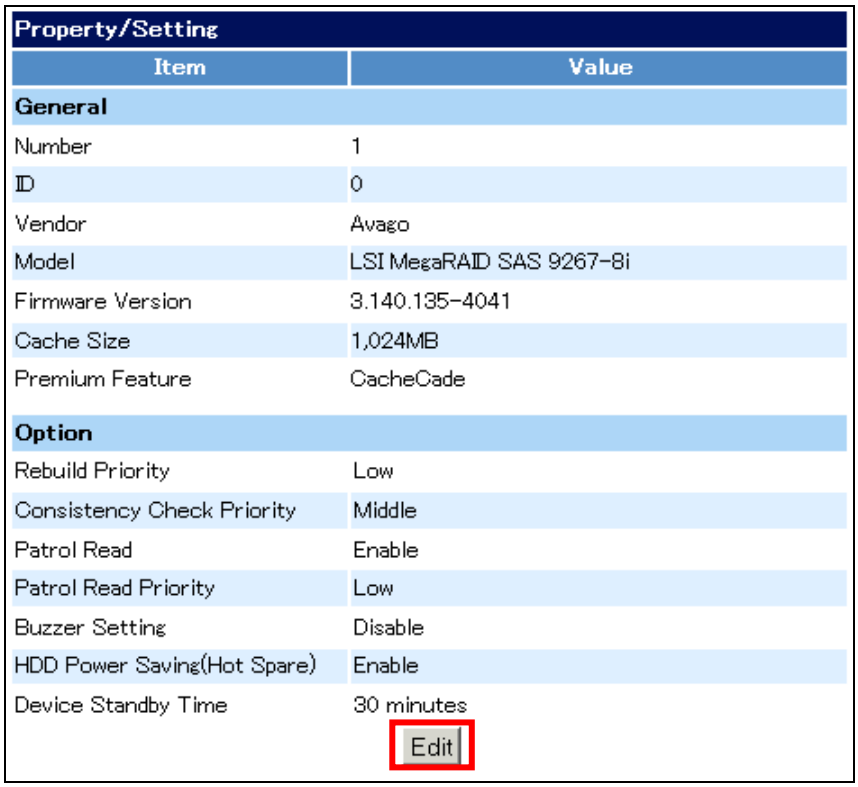
Whether Patrol Read is executed or not should be set in RAID Controllers. The procedure of setting whether Patrol Read is executed or not is described below.

IMPORTANT **Changing the setting whether Patrol Read is executed or not is available only in the Advanced Mode.**

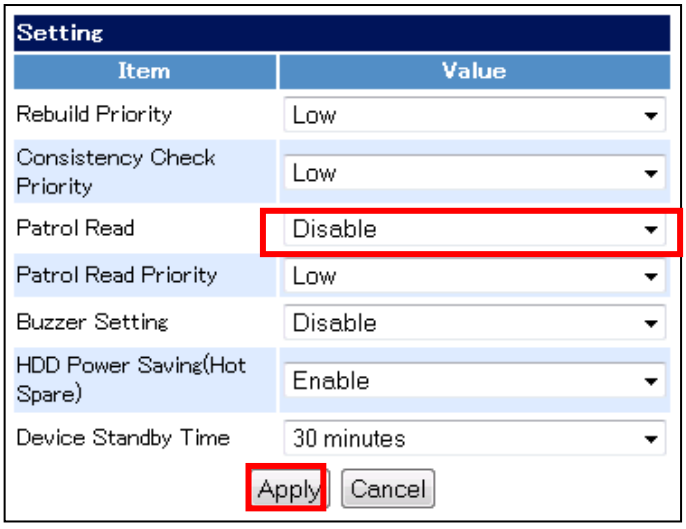
Step 1 Click a RAID Controller on the Local Navigation to set whether Patrol Read is executed or not.



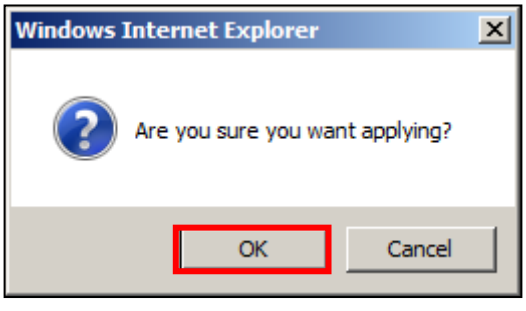
Step 2 Click [Edit] in [Property/Setting] in the Operation Area.



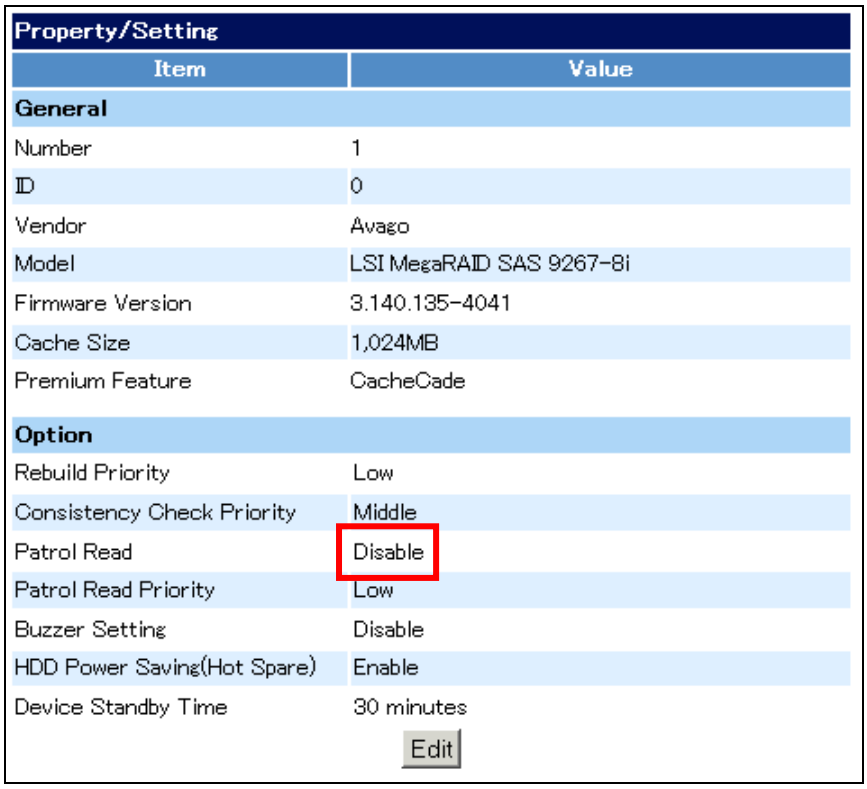
Step 3 The [Setting] window will appear. Change Patrol Read to [Enable] or [Disable]. Click [Apply].



Step 4 The window confirming if you would like to apply will open. Click [OK].



Step 5 The value for [Patrol Read] in [Property/Setting] will change the one you have set when the change of the setting whether Patrol Read is executed or not.

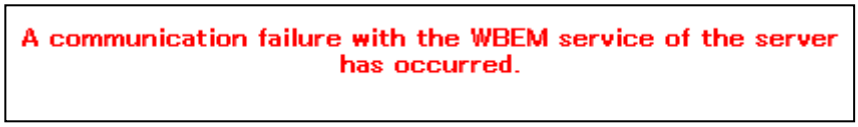


Property/Setting

Item	Value
General	
Number	1
ID	0
Vendor	Avago
Model	LSI MegaRAID SAS 9267-8i
Firmware Version	3.140.135-4041
Cache Size	1,024MB
Premium Feature	CacheCade
Option	
Rebuild Priority	Low
Consistency Check Priority	Middle
Patrol Read	Disable
Patrol Read Priority	Low
Buzzer Setting	Disable
HDD Power Saving(Hot Spare)	Enable
Device Standby Time	30 minutes

Edit

If the change fails, confirm the notification displayed on the upper left of the screen. The following image is an example when the change fails.



Checking Result of Executing Patrol Read

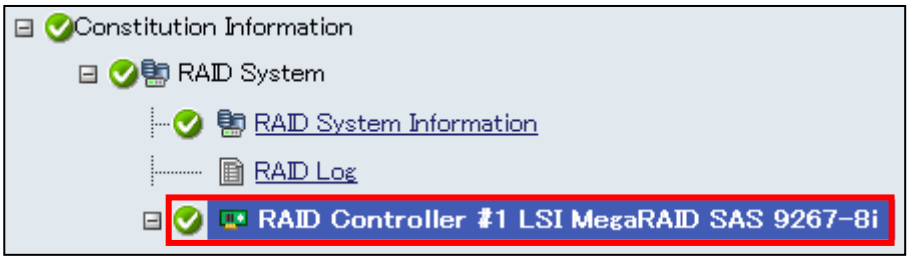
You can find the result of executing Patrol Read by checking the RAID Log of NEC ESMPRO Manager.
When it detects a problem, NEC ESMPRO Manager registers the log in the RAID Log.

Setting Patrol Read Priority

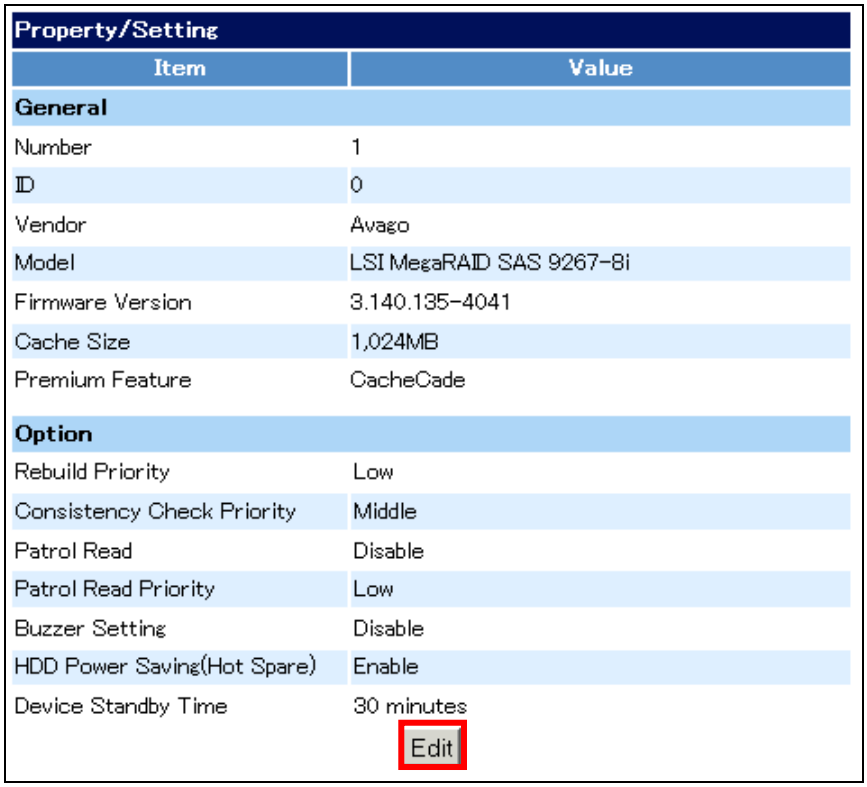
You can set the priority in which Patrol Read is executed in your server. The procedure of setting the Patrol Read Priority is described below.

Changing the priority of Patrol Read is available only in the Advanced Mode.

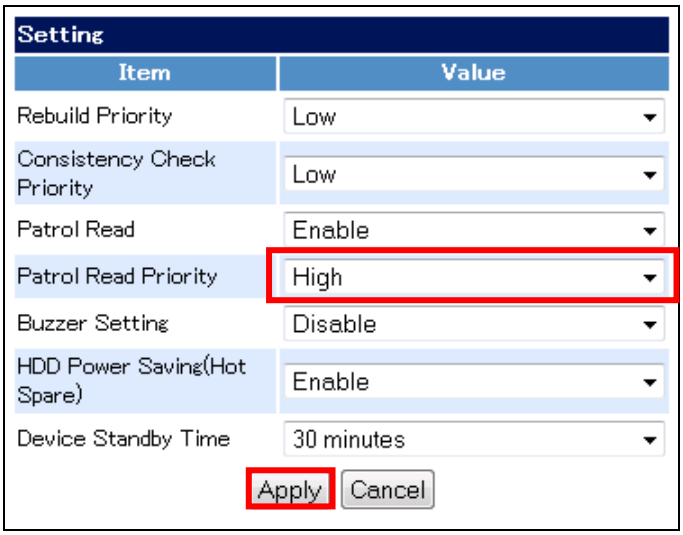
Step 1 Click a RAID Controller on the Local Navigation to set the priority of Patrol Read.



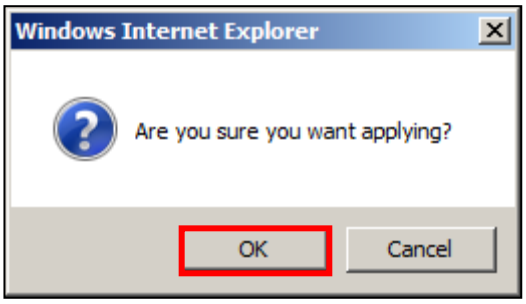
Step 2 Click [Edit] in [Property/Setting] in the Operation Area.



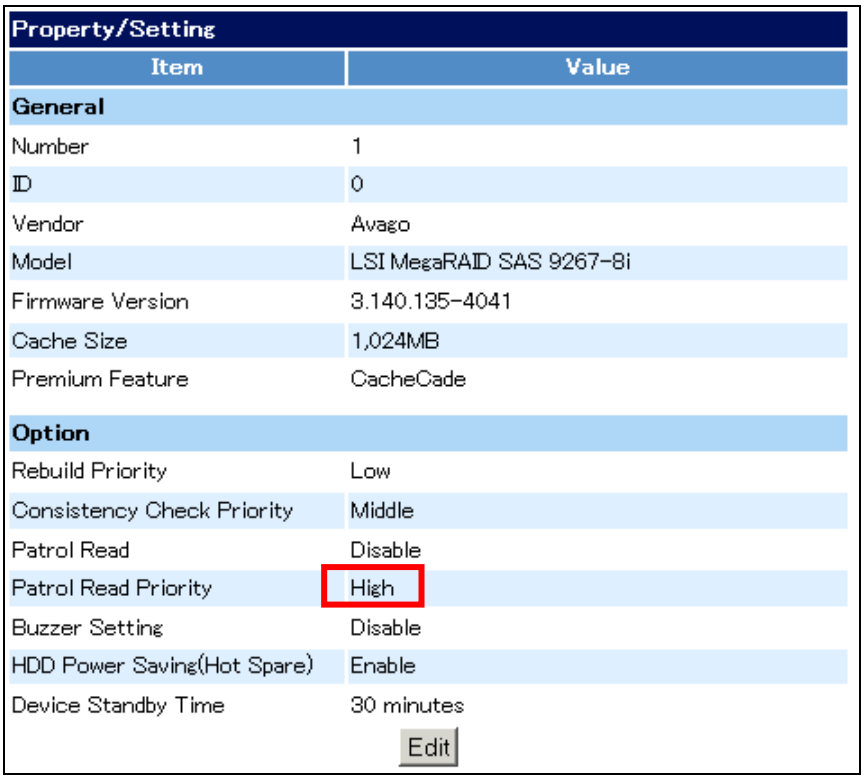
Step 3 The [Setting] window will appear. Change Patrol Read Priority to [High], [Middle], or [Low]. Click [Apply].



Step 4 The window confirming if you would like to apply will open. Click [OK].



Step 5 The value for [Patrol Read Priority] in [Property/Setting] will change the one you have set.

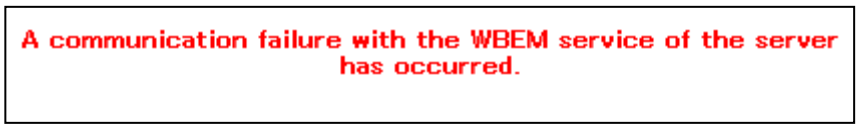


Property/Setting

Item	Value
General	
Number	1
ID	0
Vendor	Avago
Model	LSI MegaRAID SAS 9267-8i
Firmware Version	3.140.135-4041
Cache Size	1,024MB
Premium Feature	CacheCade
Option	
Rebuild Priority	Low
Consistency Check Priority	Middle
Patrol Read	Disable
Patrol Read Priority	High
Buzzer Setting	Disable
HDD Power Saving(Hot Spare)	Enable
Device Standby Time	30 minutes

Edit

If the change fails, confirm the notification displayed on the upper left of the screen. The following image is an example when the change fails.



Checking Logical Drive Consistency

The Consistency Check function checks the consistency between the data in the data area of a Logical Drive and the parity. The NEC ESMPRO Manager RAID System Management function can start or stop Consistency Check and change the priority in which Consistency Check is executed.
The Consistency Check is effective next to Patrol Read to find failures including Physical Device medium error early. Execute Consistency Check periodically if the RAID Controller does not support Patrol Read or the Patrol Read is disabled. If the Universal RAID Utility is installed, routine execution of the Consistency Check is set for RAID Controllers not supporting Patrol Read.
The Consistency Check function has two modes, [Automatic Stop Enabled] and [Automatic Stop Disabled].

Mode	Description
Start Consistency Check (Automatic Stop enabled)	Executes Consistency Check (Automatic Stop enabled) for the selected Logical Drive. In the Automatic Stop enabled mode, Consistency Check is stopped automatically when a medium error was detected frequently on an identical Physical Device.
Start Consistency Check (Automatic Stop disabled)	Executes Consistency Check (Automatic Stop disabled) for the selected Logical Drive. In the Automatic Stop disabled mode, Consistency Check keeps being executed until execution is completed when a medium error was detected frequently on an identical Physical Device.

IMPORTANT

- **Starting or stopping the Consistency Check is enabled both in the Standard Mode and Advanced Mode.**
- **The function of changing the priority at which the Consistency Check is executed is available only in the Advanced Mode.**

CHECK

If you execute Consistency Check to a Logical Drive in a Disk Array, the Consistency Check will also be done to other Logical Drives in the Disk Array.

TIPS

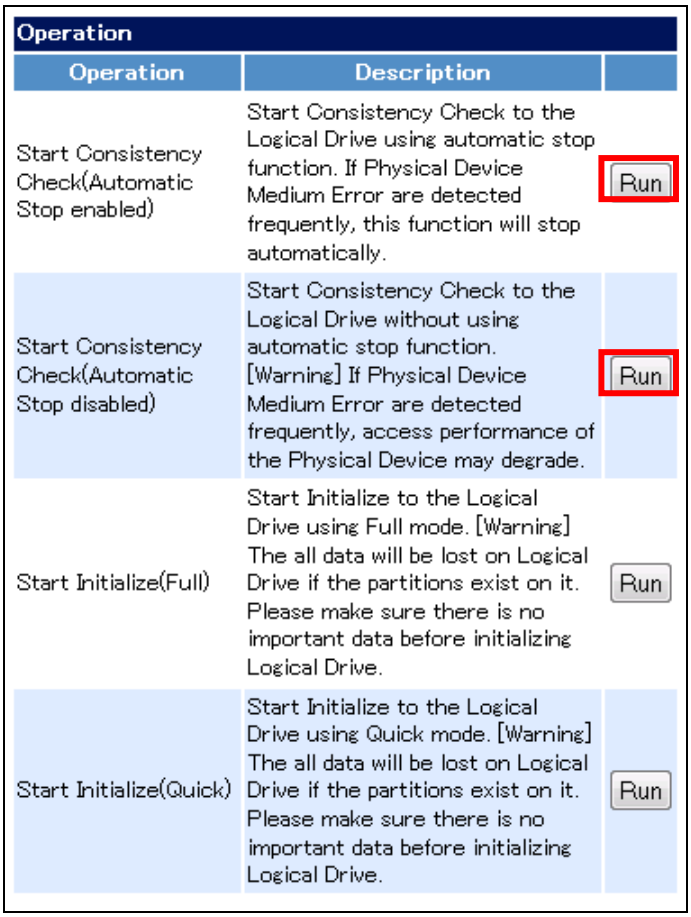
The Consistency Check can be executed only for Logical Drives with [Status] being [Online].
The Consistency Check cannot be executed for Logical Drives with RAID Level being RAID 0.

Executing Consistency Check Manually

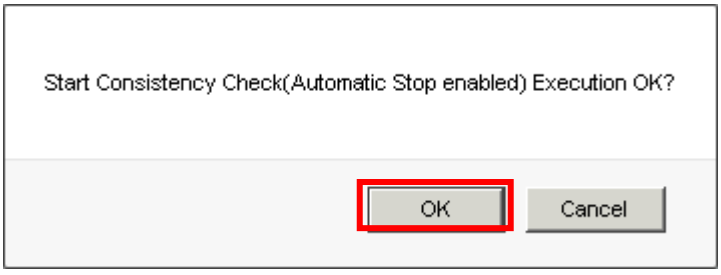
Consistency Check is executed in Logical Drives. The procedure of starting Consistency Check is described below.

Step 1 Click the Logical Drive to execute Consistency Check in the Local Navigation.

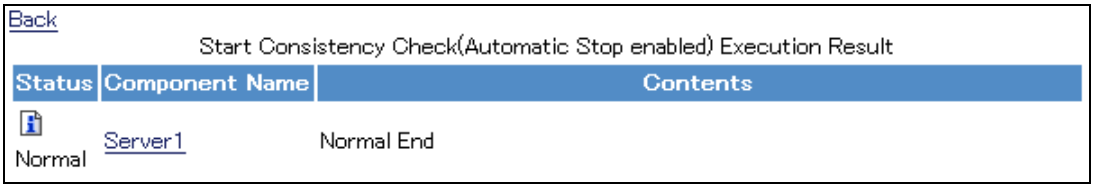
Step 2 Click [Run] for [Start Consistency Check (Automatic Stop enabled)] or [Start Consistency Check (Automatic Stop disabled)] in [Operation] in the Operation Area.



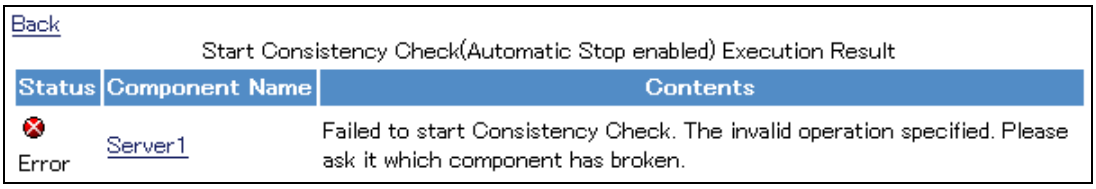
Step 3 The window confirming if you would like to apply will open. Click [OK].



Step 4 The [Start Consistency Check Execution Result] window will open. The following window is an example when it succeeds.



The following window is an example when it fails. Check the content of the window.

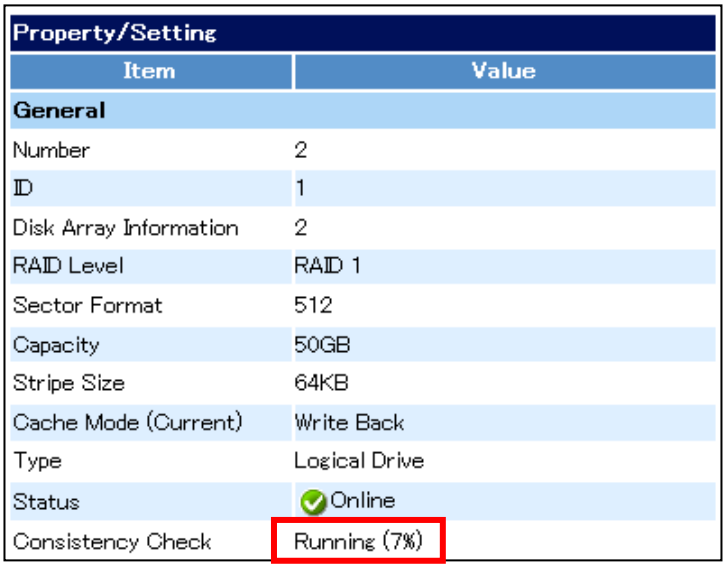


Back

Start Consistency Check(Automatic Stop enabled) Execution Result

Status	Component Name	Contents
Error	Server1	Failed to start Consistency Check. The invalid operation specified. Please ask it which component has broken.

Step 5 Clicking that Logical Drive during Consistency Check will display the progress of the Consistency Check in [Property\Setting].



Property/Setting

Item	Value
General	
Number	2
ID	1
Disk Array Information	2
RAID Level	RAID 1
Sector Format	512
Capacity	50GB
Stripe Size	64KB
Cache Mode (Current)	Write Back
Type	Logical Drive
Status	Online
Consistency Check	Running (7%)

Executing Scheduled Consistency Check for Logical Drive

You can perform scheduled Consistency Check using Remote Batch function.
The scheduled Consistency Check makes it possible to detect failures such as media errors on the RAID Controller which does not support the Patrol Read function.
For details of Remote Batch, see the online help of NEC ESMPRO Manager.

IMPORTANT

- **The function can use to RAID Controller(s) which is managed with LSI SMI-S Provider. But it cannot use to RAID Controller(s) which is managed with HPE WBEM Provider.**
  For RAID Controller(s) which is managed with HPE WBEM Provider, the task of consistency check is scheduled, but it will not run.
- **Scheduled Consistency Check by Remote Batch performs Consistency Check (Automatic Stop enabled) to all the Logical Drives.**
- **Scheduled Consistency Check can be done only when [Remote Batch Setting] has been enable as user authority**

Tasks registered by Remote Batch

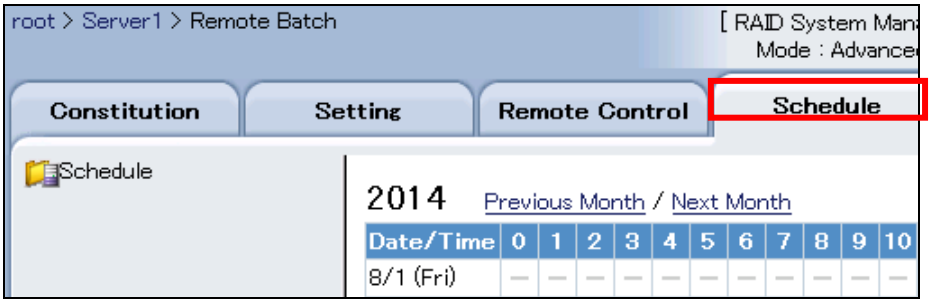
You can register the following items for Remote Batch.

Item	Description
Select Remote Batch	Select the schedule you want to change. To add a schedule, select "New".
Remote Batch Item	Consistency Check of RAID System (All Logical Drives): Start the Consistency Check (Automatic Stop enabled) of RAID System to all Logical Drives
Remote Batch Type	Set the type of remote batch processing repetition. Specified Date, Weekly, or Monthly can be selected for "Remote Batch Type". "Specified Date" performs processing only once at specified date/time. You can specify the date/time for two month. "Weekly" performs processing once a week at the same time on a specified day of the week. "Monthly" performs processing once a month at the same time on a specified day of the first week.
Start Date/Time	Set the date/time when "Remote Batch Item" is to be executed. If "Remote Batch Type" is Monthly, select a day of the first week of the month.

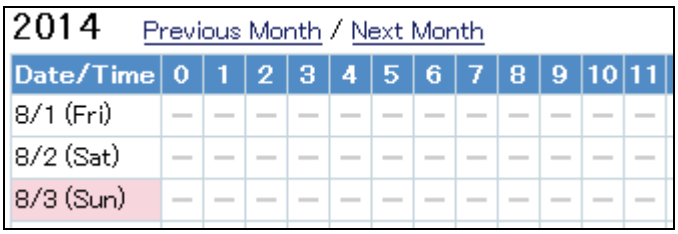
Registering Remote Batch

The procedure to register a Remote Batch is described below.

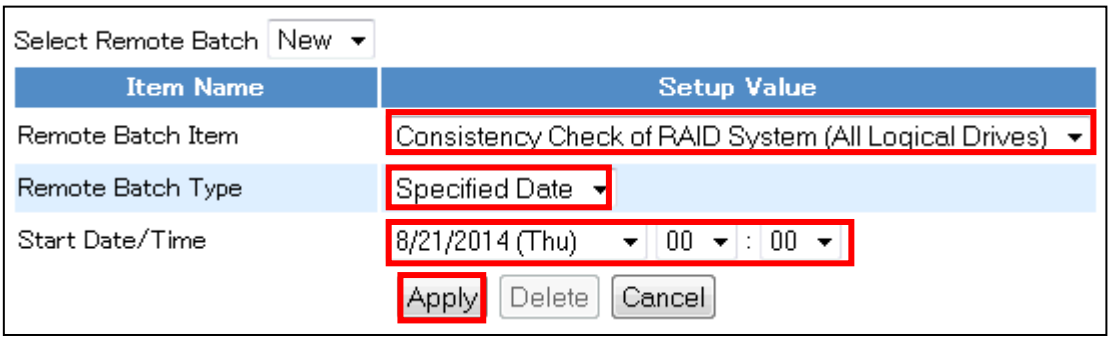
Step 1 Click the [Schedule] tab.


root > Server1 > Remote Batch
[RAID System Mana
Mode : Advance
Constitution
Setting
Remote Control
Schedule
Schedule
2014
Previous Month / Next Month
Date/Time 0 1 2 3 4 5 6 7 8 9 10
8/1 (Fri)

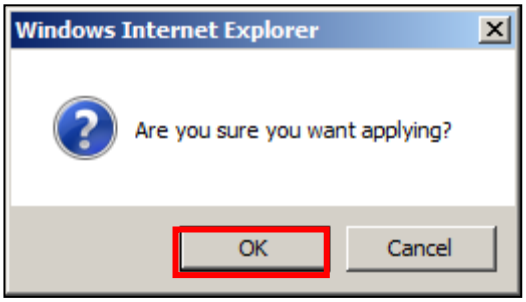
Step 2 Click the date and time you would like to perform the Remote Batch from the calendar.



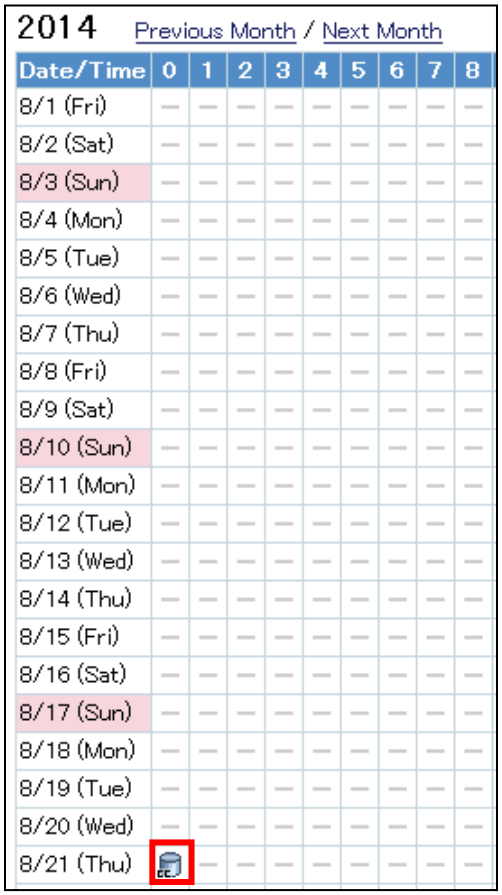
Step 3 Display the setting window of Remote Batch. Select [Consistency Check of RAID System (All Logical Drives)] as [Remote Batch Item]. Also set Remote Batch Type and Start Date/Time and click [Apply].



Step 4 The window confirming if you would like to apply will open. Click [OK].



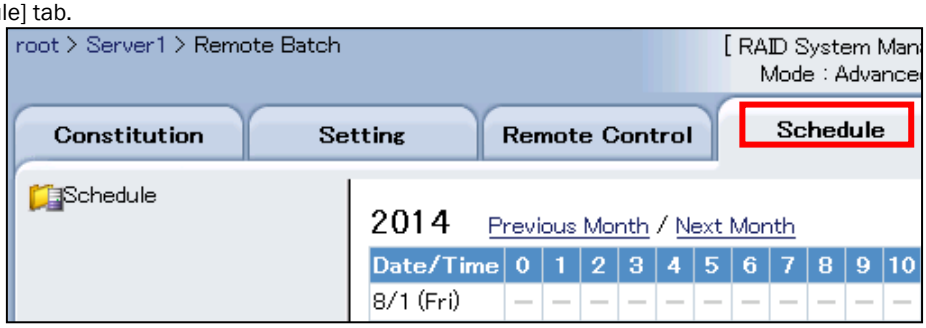
Step 5 After the setting completes, an icon will appear on the column of the date and time to perform Remote Batch.



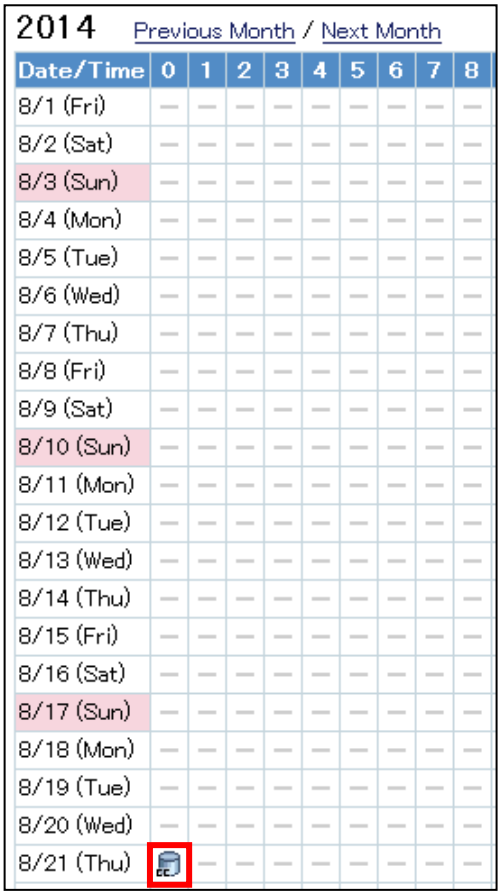
Changing the settings of Remote Batch

The procedure to change the settings of Remote Batch is described below.

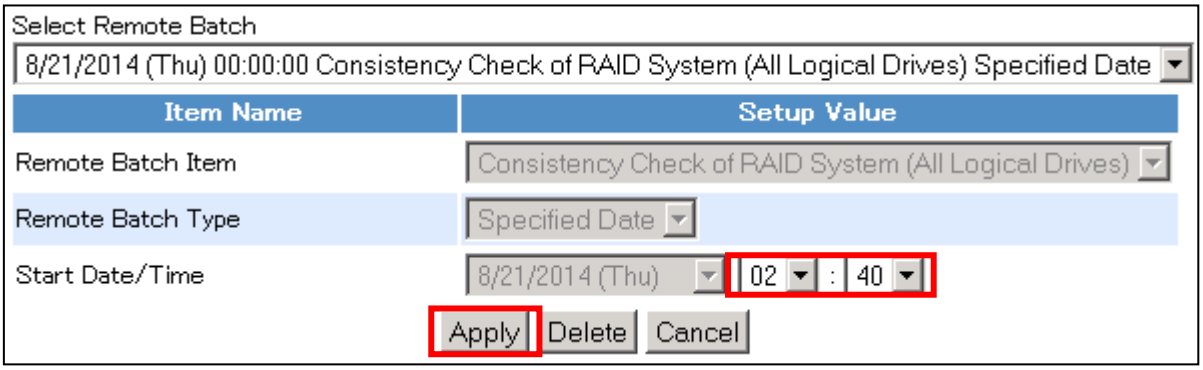
Step 1 Click the [Schedule] tab.



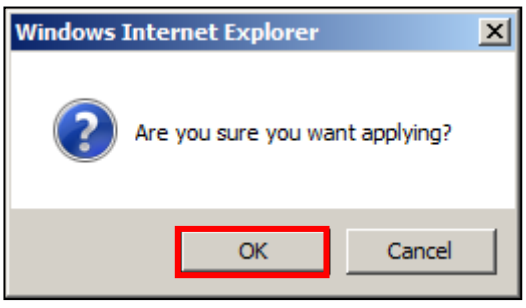
Step 2 Click the icon of the Remote Batch to change the settings on the calendar.



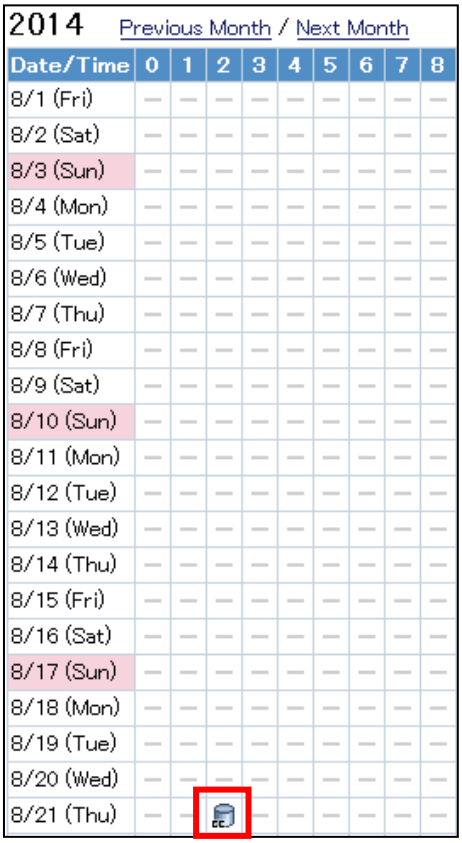
Step 3 The setting window appears. Change the time to start and click [Apply].



Step 4 The window confirming if you would like to apply will open. Click [OK].



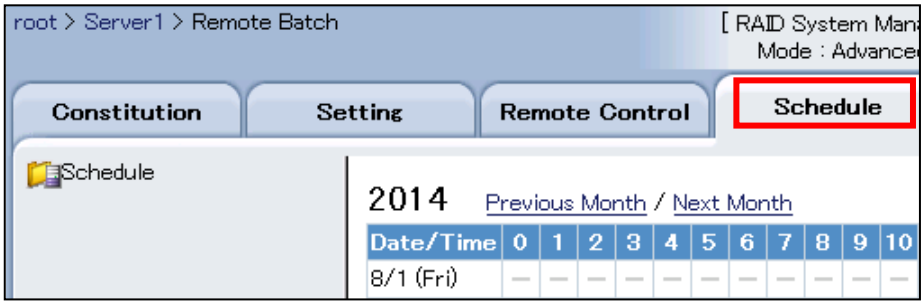
Step 5 After the change completes, an icon will appears on the column of the date and time to perform the Remote Batch.



Deleting the settings of Remote Batch

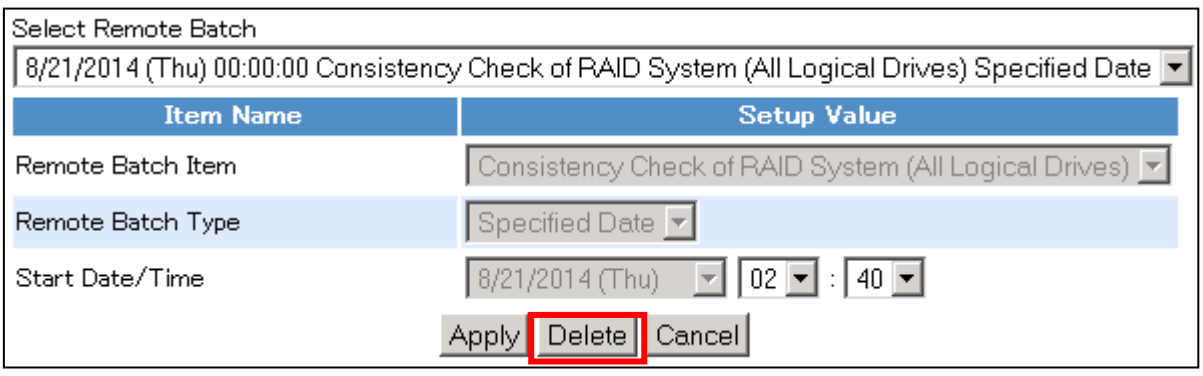
The procedure to delete the Remote Batch is described below.

Step 1 Click the [Schedule] tab.

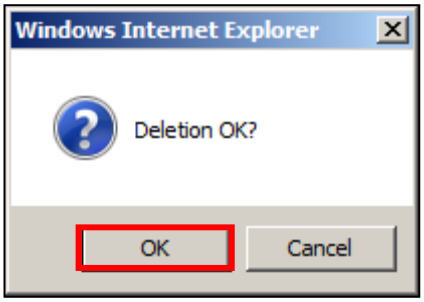


Step 2 Click the icon of the Remote Batch to change the settings on the calendar.

Step 3 The setting window appears. Change the time to start and click [Delete]



Step 4 The window confirming if you would like to delete will open. Click [OK].



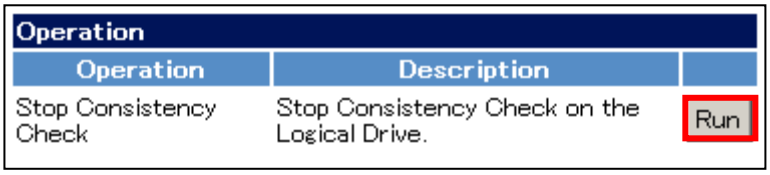
Step 5 After the deletion completes, you can see the icon has been deleted on the column of the date and time to perform the Remote Batch.

Stopping Consistency Check

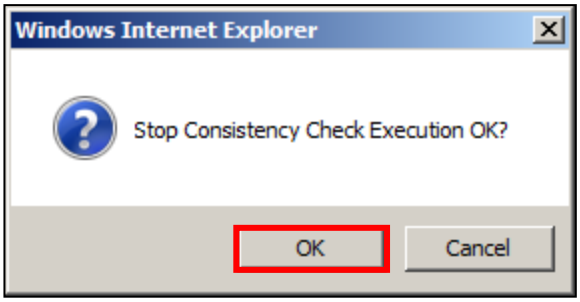
You can stop Consistency Check being executed on the way. The procedure of stopping Consistency Check is described below.

Step 1 Click the Logical Drive for which you would like to stop Consistency Check in the Local Navigation.

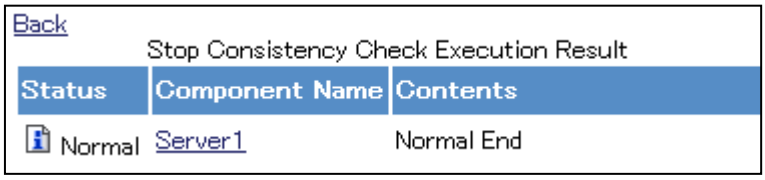
Step 2 Click [Run] for [Stop Consistency Check] in [Operation] in the Operation Area. The item “Stop Consistency Check” appears only when Consistency Check is running.



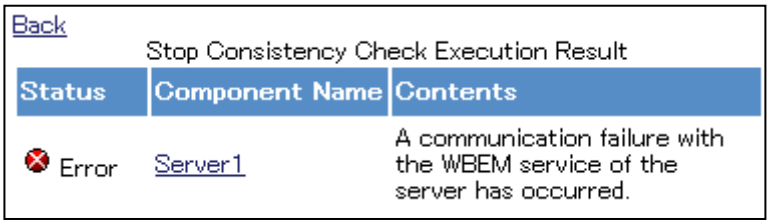
Step 3 The window confirming if you would like to stop Consistency Check will open. Click [OK]



Step 4 The [Stop Consistency Check Execution Result] window will appear. Click [OK]



If [Stop Consistency Check] fails, confirm [Contents] for the error.

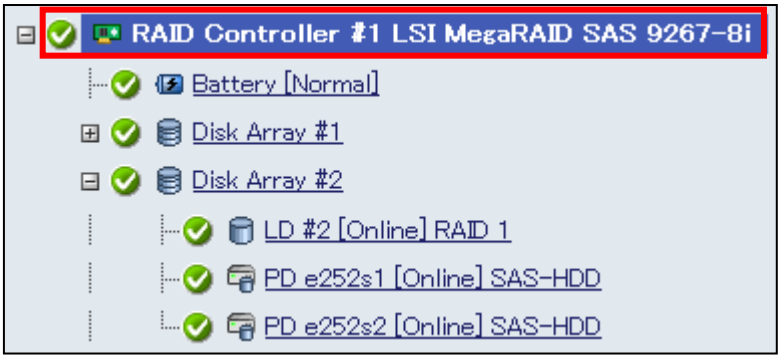


Setting Consistency Check Priority

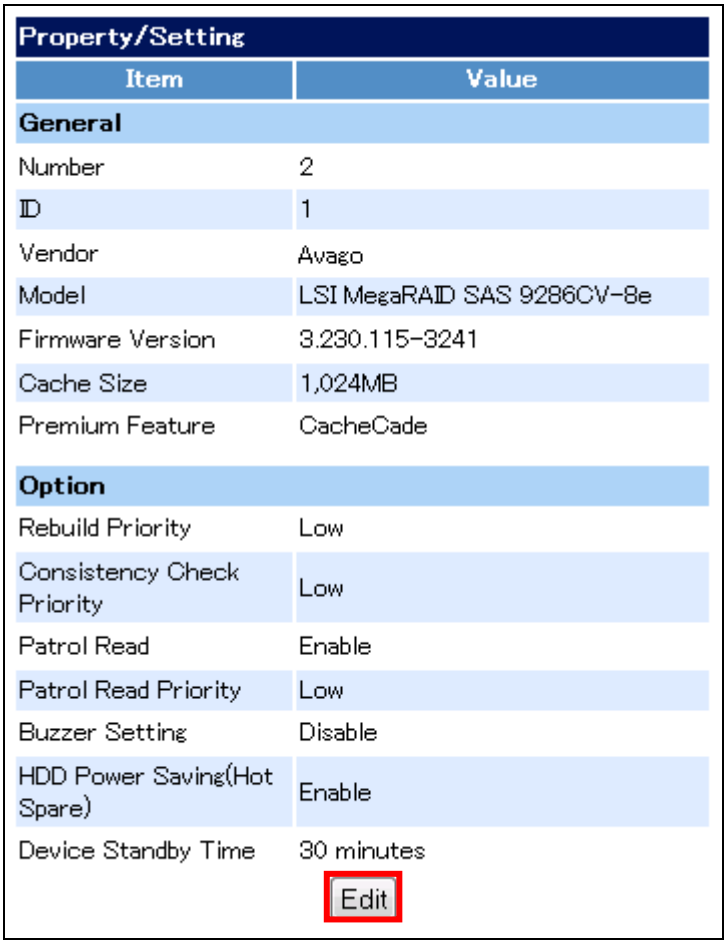
You can set the priority at which Consistency Check is executed in the server. The procedure of setting the Consistency Check Priority is described below.

> The Consistency Check Priority is common between [Consistency Check (Automatic Stop enabled)] and [Consistency Check (Automatic Stop disabled)].

Step 1 Click the Logical Drive for which you would like to stop Consistency Check in the Local Navigation.



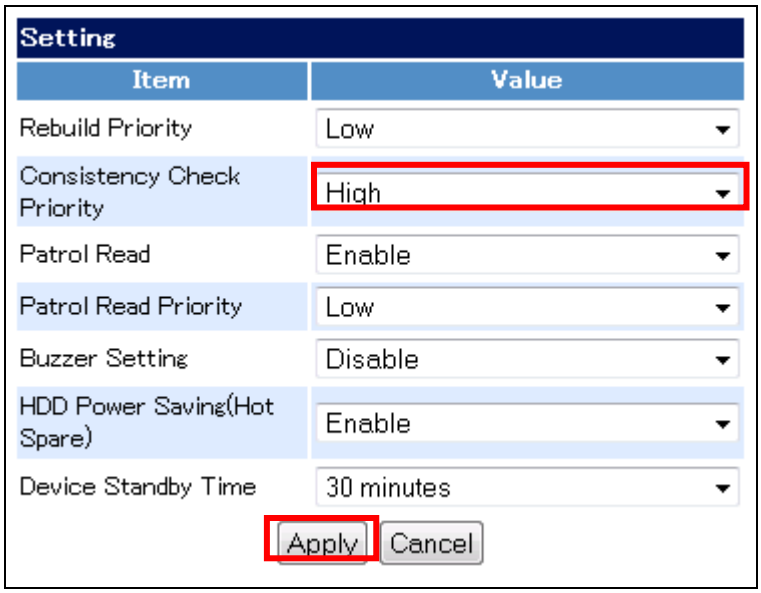
Step 2 Click [Edit] in [Priority/Setting] in the Local Navigation.



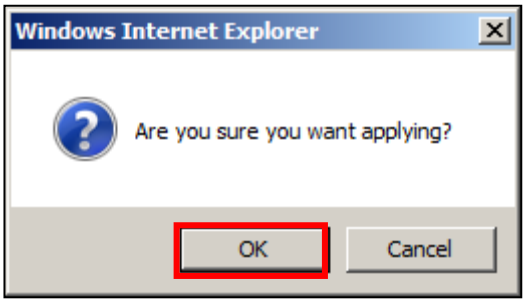
Property/Setting	
Item	**Value**
General	
Number	2
ID	1
Vendor	Avago
Model	LSI MegaRAID SAS 9286CV-8e
Firmware Version	3.230.115-3241
Cache Size	1,024MB
Premium Feature	CacheCade
Option	
Rebuild Priority	Low
Consistency Check Priority	Low
Patrol Read	Enable
Patrol Read Priority	Low
Buzzer Setting	Disable
HDD Power Saving(Hot Spare)	Enable
Device Standby Time	30 minutes

Edit

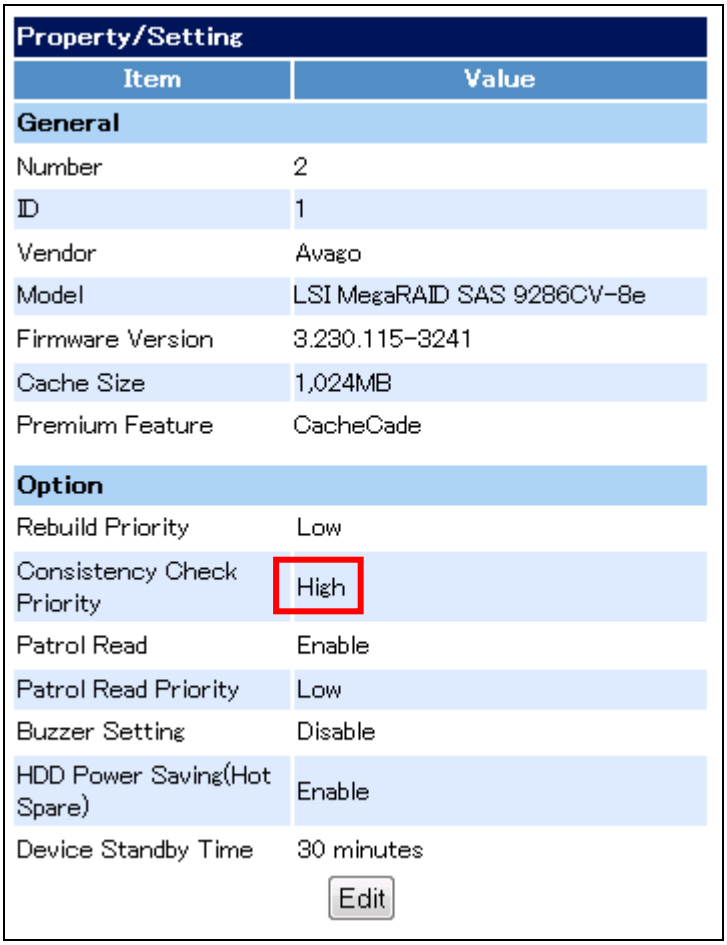
Step 3 The [Setting] window will appear. Change the value of the Consistency Check Priority to High, Middle, or Low. Click [Apply].



Step 4 . The window confirming if you would like to apply will appear. Click [OK]



Step 5 After changing the Consistency Check Priority is finished successfully, you can see the value of [Consistency Check Priority] in [Priority/Setting] has been changed to the value you set.

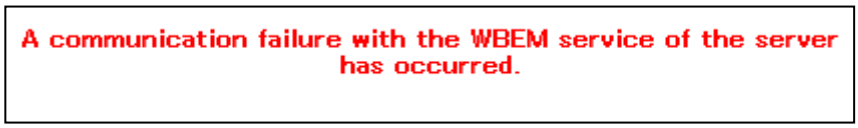


Property/Setting

Item	Value
General	
Number	2
ID	1
Vendor	Avago
Model	LSI MegaRAID SAS 9286CV-8e
Firmware Version	3.230.115-3241
Cache Size	1,024MB
Premium Feature	CacheCade
Option	
Rebuild Priority	Low
Consistency Check Priority	High
Patrol Read	Enable
Patrol Read Priority	Low
Buzzer Setting	Disable
HDD Power Saving(Hot Spare)	Enable
Device Standby Time	30 minutes

Edit

If the change of Consistency Check Priority fails, confirm the notification displayed on the upper area of the screen. The following image is an example when the change fails.



Initializing Logical Drive

Use the “Initialize” function when you want to erase the data saved in a Logical Drive.
Initialize has two modes listed in the table below.

Mode	Description
Full	Writes 0s into the entire area of a Logical Drive to erase the data fully.
Quick	Writes 0s into some blocks in a Logical Drive. Only erases OS installation and partition management information. Initialize of the mode is completed earlier than that of the full mode. However, because 0s are not written into the remaining area, data consistency is not held in the Logical Drive.

IMPORTANT

- **Initialize is available only in the Advanced Mode.**
- **You can initialize Logical Drive with partitions.**
- **Before initializing Logical Drive, check if the Logical Drive contains required data. Initializing a Logical Drive causes all the data saved in the Logical Drive to be lost.**

CHECK

The Consistency Check of a Logical Drive initialized in the quick mode causes a data inconsistency error to occur due to no data consistency.

TIPS

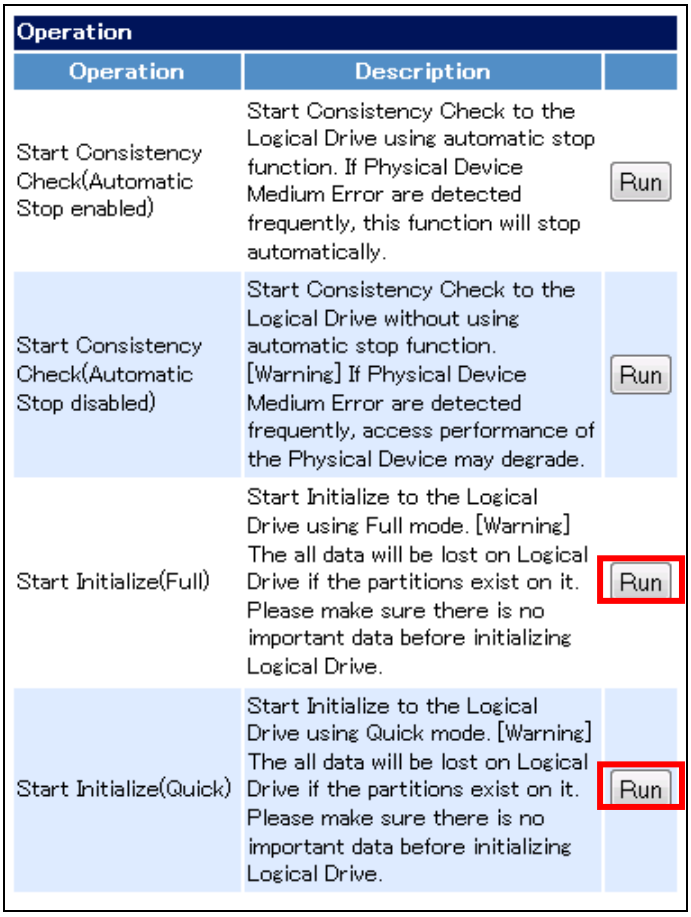
Initialize cannot be executed for any Logical Drive with [Status] being [Online].

Executing Initialize

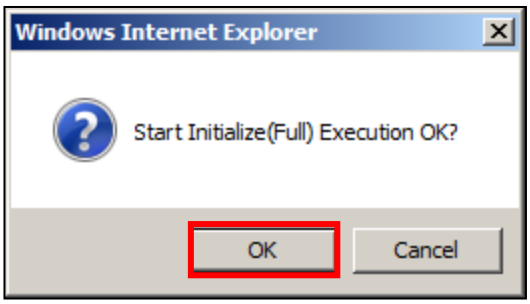
Initialize should be executed in Logical Drives. The procedure of executing Initialize is described below.

Step 1 Click a Logical Drive to initialize on the Local Navigation.

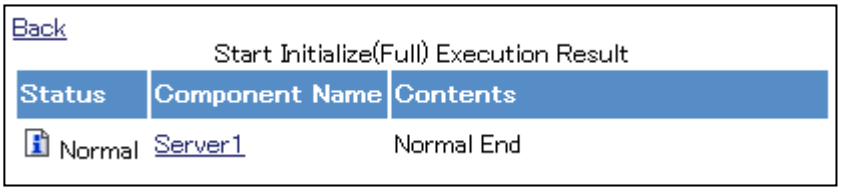
Step 2 Click [Run] for [Start Initialize (Full)] or [Start Initialize (Quick)] in [Operation] in the Operation Area.
The following description is for when you select [Start Initialize (Full)]. For the procedure for [Start Initialize (Quick)], replace [Start Initialize (Full)] to [Start Initialize (Quick)].



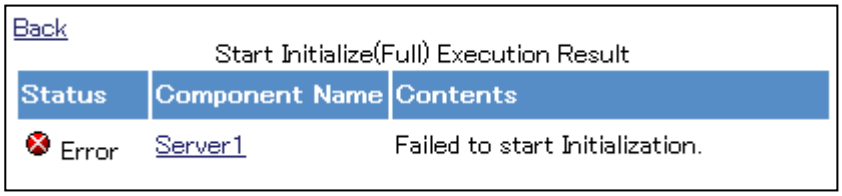
Step 3 The window confirming if you would like to initialize the Logical Drive. Click [OK].



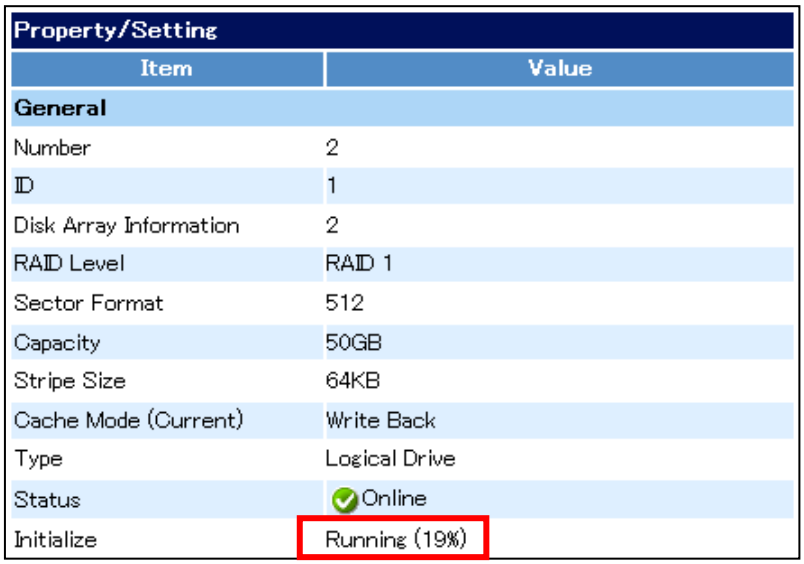
Step 4 The [Start Initialize (Full) Execution Result] window will appear. The following image is an example when Initialize is finished successfully.



The following image is an example when Initialize fails. Check the Contents on the window.



Step 5 Click the Logical Drive being initialized in the Local Navigation. You can see the Initialize is running in [Property/Setting].



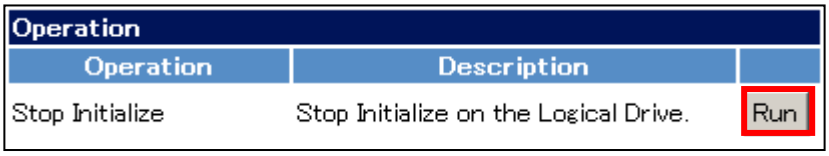
The progress of Initialize will be displayed after starting Initialize (Full).

Stopping Initialize

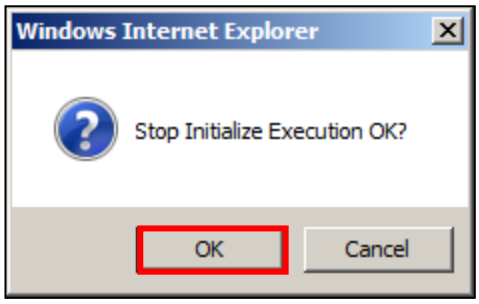
You can stop Initialize being executed on the way. The procedure of stopping Initialize is described below.

Step 1 Click the Logical Drive to stop initialization on the Local View.

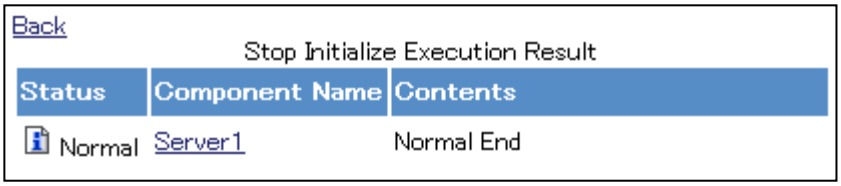
Step 2 Click [Run] for [Stop Initialize] in [Operation] in the Operation Area. [Stop Initialize] will appear when [Start Initialize (Full)] is being done.



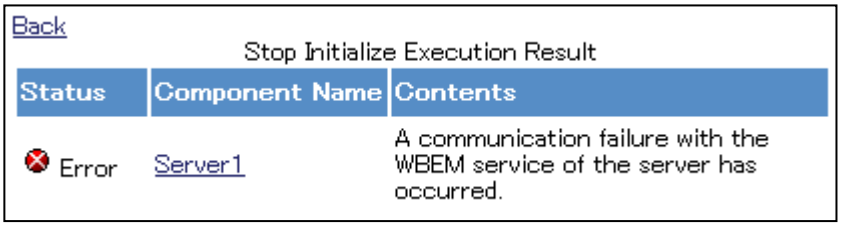
Step 3 The window confirming if you would like to stop initialization. Click [OK].



Step 4 The [Stop Initialize Execution Result] window will appear. The following image is an example when stopping initialization is finished successfully.



The following image is an example when stop initialization fails. Check the Contents on the window.



Changing Cache Mode of Logical Drive

You can change the cache mode of Logical Drive.
The range of change differs depending on the type of the RAID Controller.

> **IMPORTANT** **The setting of the cache mode of Logical Drive influences the performance of server. Please change carefully.**

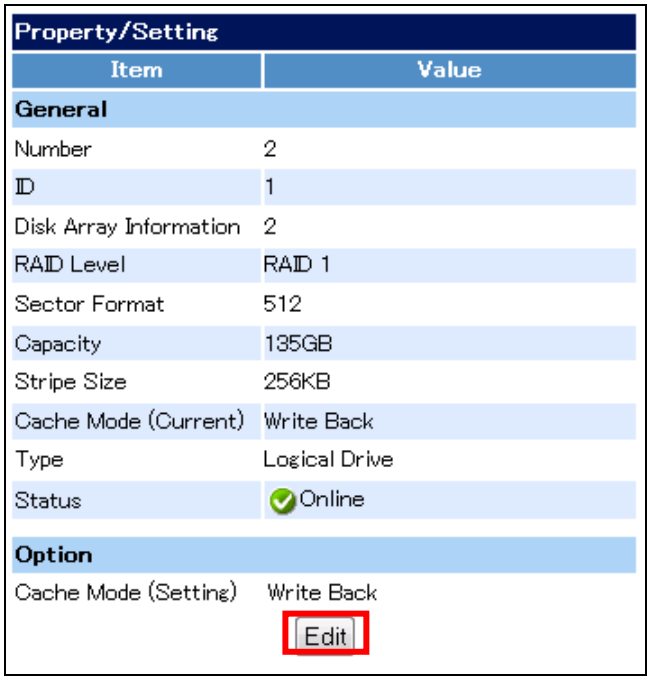
Setting cache mode

The procedure of setting cache mode of Logical Drive is described below.

> **IMPORTANT** **Changing cache mode is available only in the Advanced Mode.**

Step 1 Click the Logical Drive to change the cache mode on the Logical Navigation.

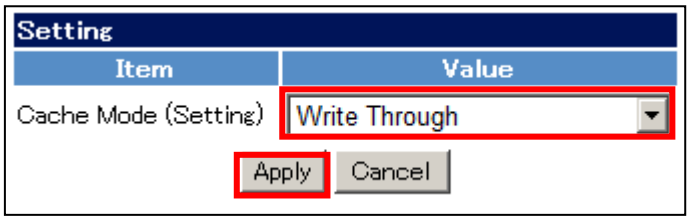
Step 2 Click [Edit] in [Property/Setting] on the Operation Area.



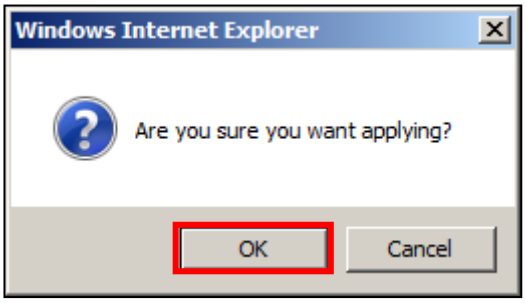
Property/Setting	
Item	**Value**
General	
Number	2
ID	1
Disk Array Information	2
RAID Level	RAID 1
Sector Format	512
Capacity	135GB
Stripe Size	256KB
Cache Mode (Current)	Write Back
Type	Logical Drive
Status	Online
Option	
Cache Mode (Setting)	Write Back

Edit

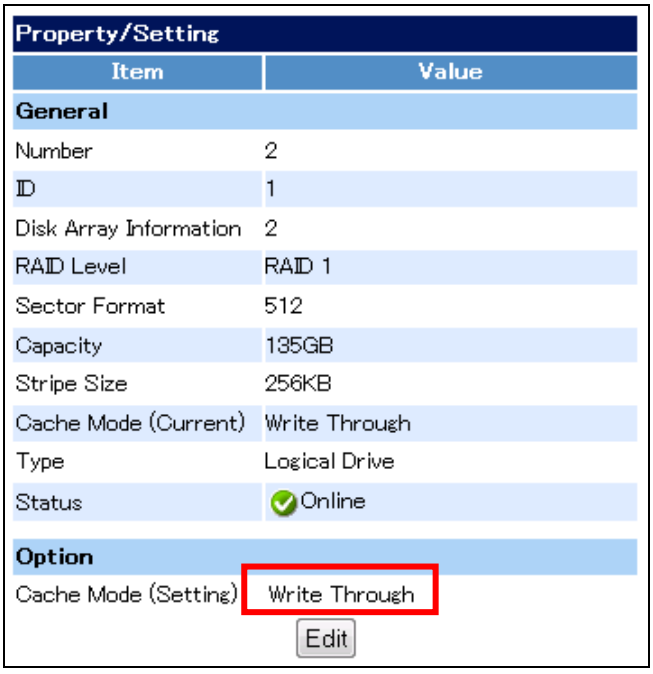
Step 3 The [Setting] window will appear. Change the value of [Cache mode (Setting)] to Auto, Write Back or Write Through. Click [Apply].



Step 4 The window confirming if you would like to apply will appear. Click [OK].

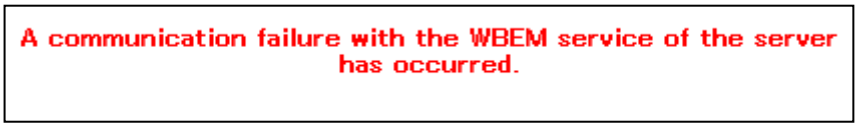


Step 5 After the change of the cache mode is finished successfully, the value of [Cache Mode (Setting)] in [Property/Setting] becomes that you have set.



Step 6

If the change of the cache mode fails, check the content displayed in the upper area of the screen. The following image is an example when the change fails.



Rebuilding Physical Device

Rebuild means incorporation of a new Physical Device to a Logical Drive after a Physical Device is replaced with the new one due to occurrence of an event such as a failure. In general, the Rebuild is automatically started by a function of the RAID Controller called standby rebuild or hot-swap rebuild. Accordingly, manual Rebuild is not required so often. If required, use NEC ESMPRO Manager.

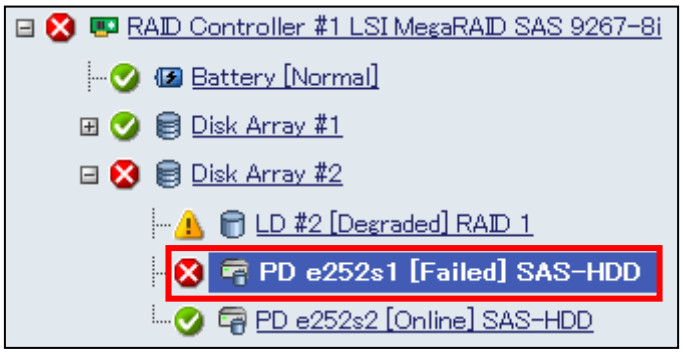
> TIPS
>
> Rebuild can be executed if [Status] of a Physical Device is set to [Failed] and [Status] of the Logical Drive using the Physical Device is set to [Degraded].
>
> The Physical Device either which detects S.M.A.R.T. error or whose SSD Endurance Remaining is “Running out (20-11%)”, “Need to replace (10% or less)” cannot start Rebuild from NEC ESMPRO Manager.

Executing Rebuild

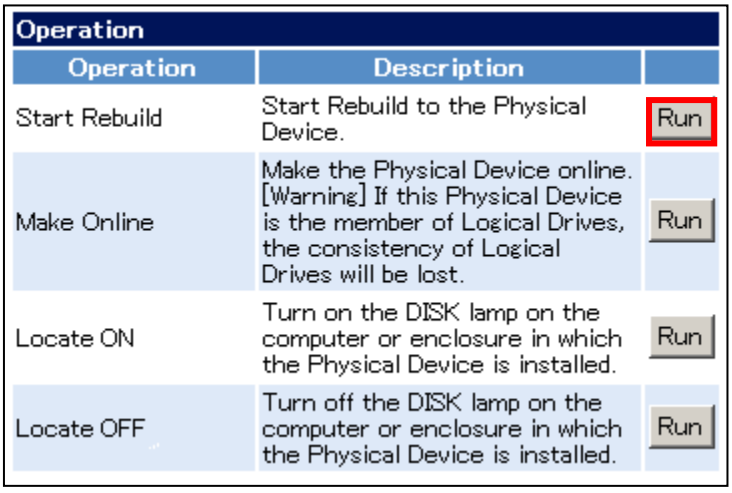
Rebuild is executed for a Physical Device. The procedure of executing Rebuild is described below.

> IMPORTANT
>
> **Manual Rebuild is available only in the Advanced Mode.**

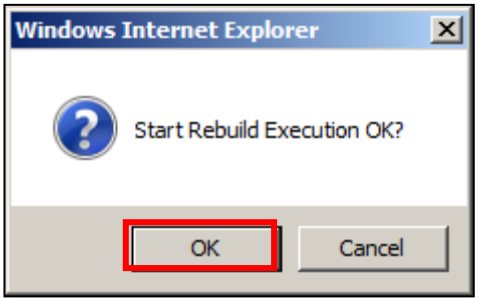
Step 1 Click the Physical Device to rebuild on the Local Navigation.



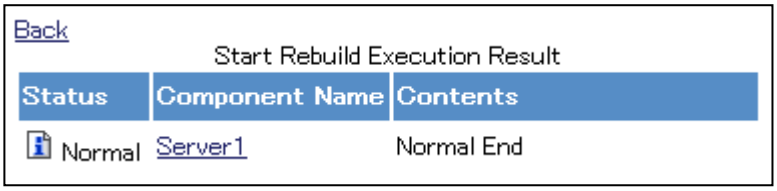
Step 2 Click [Run] for [Start Rebuild] in [Operation] in the Operation Area.



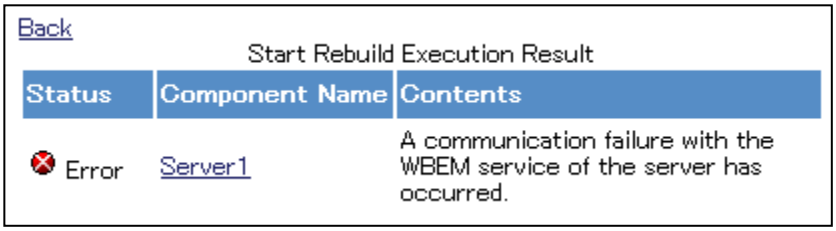
Step 3 The window confirming if you would like to start rebuilding. Click [OK].



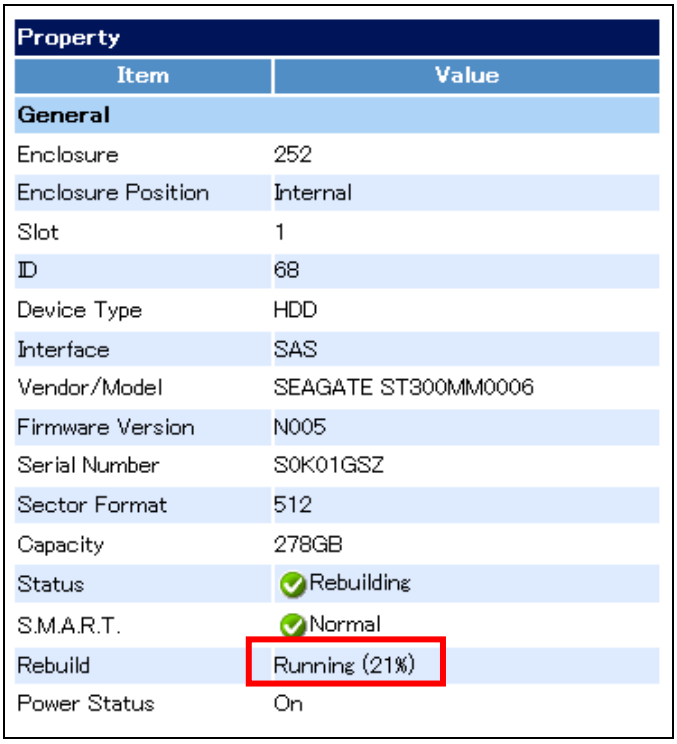
Step 4 The [Start Rebuild Execution Result] window will appear.
The following image is an example when the rebuilding is finished successfully.



If starting rebuilding fails, check the Contents of the window.



Step 5 [Rebuild] will appear in [Property] during rebuilding.



Property	
Item	**Value**
General	
Enclosure	252
Enclosure Position	Internal
Slot	1
ID	68
Device Type	HDD
Interface	SAS
Vendor/Model	SEAGATE ST300MM0006
Firmware Version	N005
Serial Number	S0K01GSZ
Sector Format	512
Capacity	278GB
Status	Rebuilding
S.M.A.R.T.	Normal
Rebuild	Running (21%)
Power Status	On

The status of the Physical Device being rebuilding will become “Rebuilding”

Stopping Rebuild

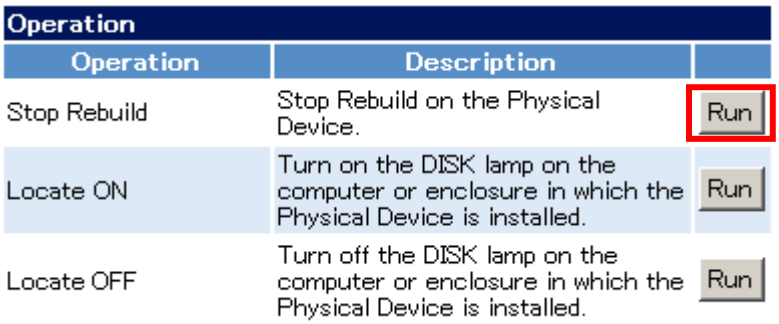
You can stop Rebuild being executed on the way. The procedure of stopping Rebuild is described below.

The function of stopping Rebuild is available only in the Advanced Mode.

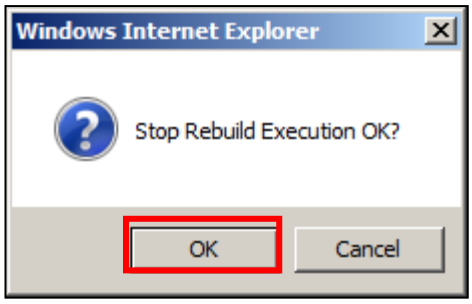
Some types of RAID Controller do not support stopping rebuild. If it does not support this function, the stop button of the Operation Area of NEC ESMPRO Manager does not become enabled.

Step 1 Click the Physical Device to stop rebuilding.

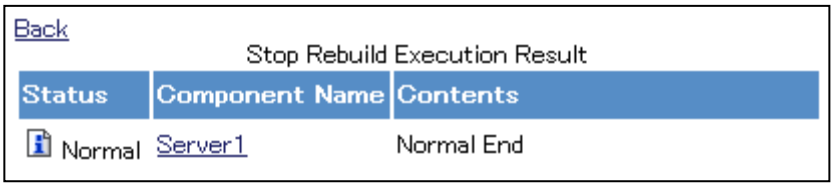
Step 2 Click [Run] for [Stop Rebuild] in Operation in the Operation Area. [Stop Rebuild] appears during rebuilding.



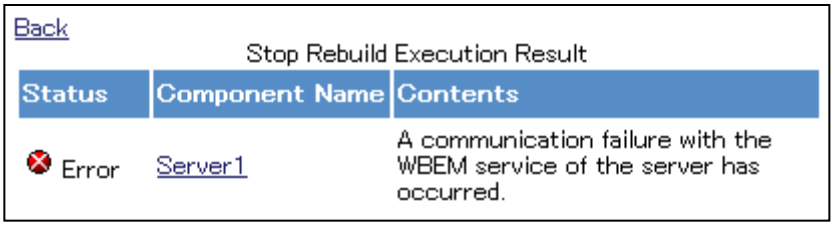
Step 3 The window confirming if you would like to stop rebuilding. Click [OK].



Step 4 The [Stop Rebuild Execution Result] window will appear.
The following image is an example when stopping rebuilding is finished successfully.



If starting rebuilding fails, check the Contents of the window.

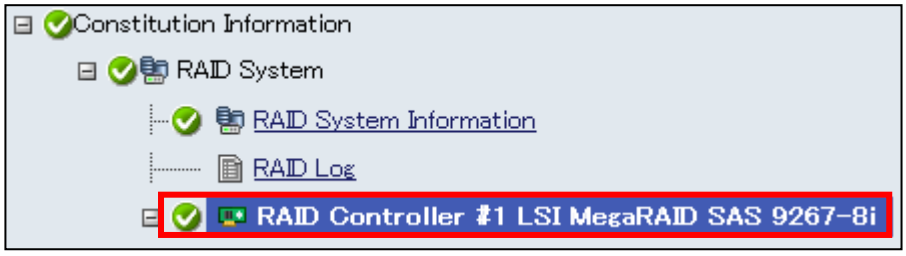


Setting Rebuild Priority

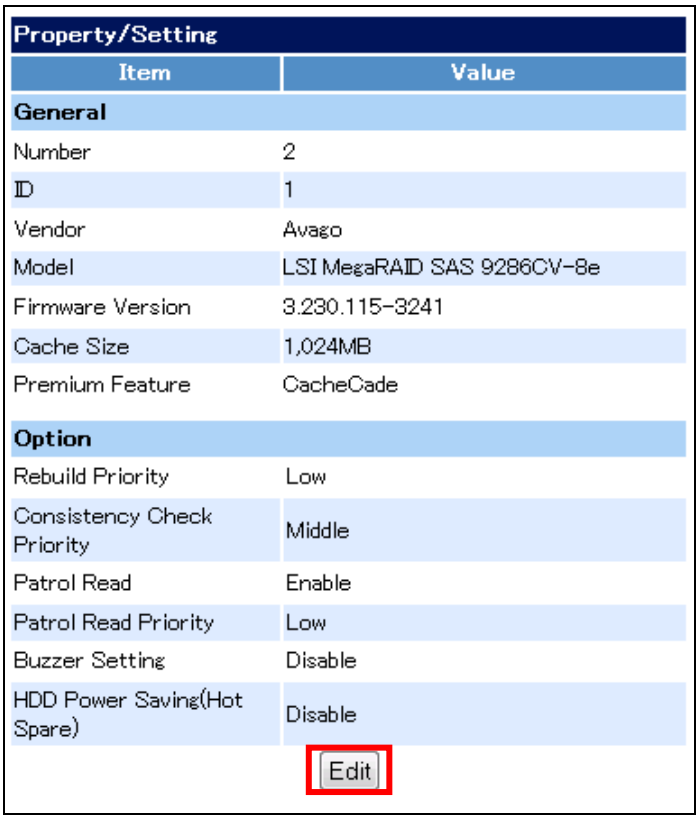
You can set the priority at which Rebuild is executed in the server. The procedure of setting the Rebuild Priority is described below.

Setting Rebuild Priority is available only in the Advanced Mode.

Step 1 Click the RAID Controller to set the Rebuild Priority on the Local Navigation.



Step 2 Click [Edit] in [Property/Setting] in the Operation Area.

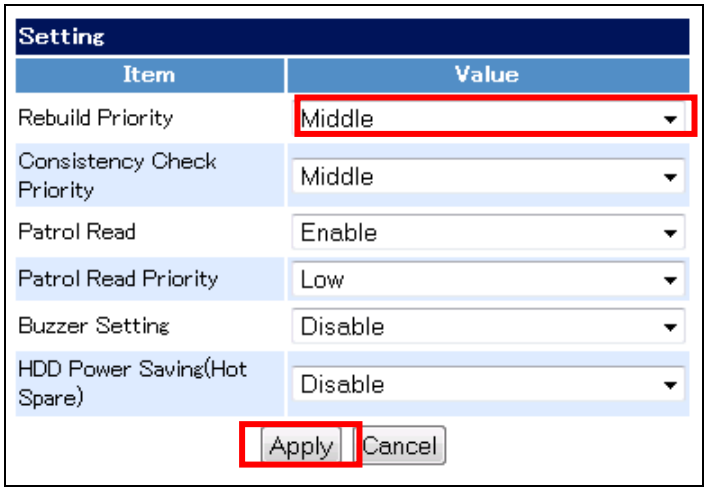


Property/Setting

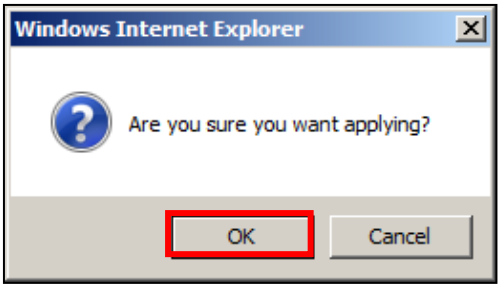
Item	Value
General	
Number	2
ID	1
Vendor	Avago
Model	LSI MegaRAID SAS 9286CV-8e
Firmware Version	3.230.115-3241
Cache Size	1,024MB
Premium Feature	CacheCade
Option	
Rebuild Priority	Low
Consistency Check Priority	Middle
Patrol Read	Enable
Patrol Read Priority	Low
Buzzer Setting	Disable
HDD Power Saving(Hot Spare)	Disable

Edit

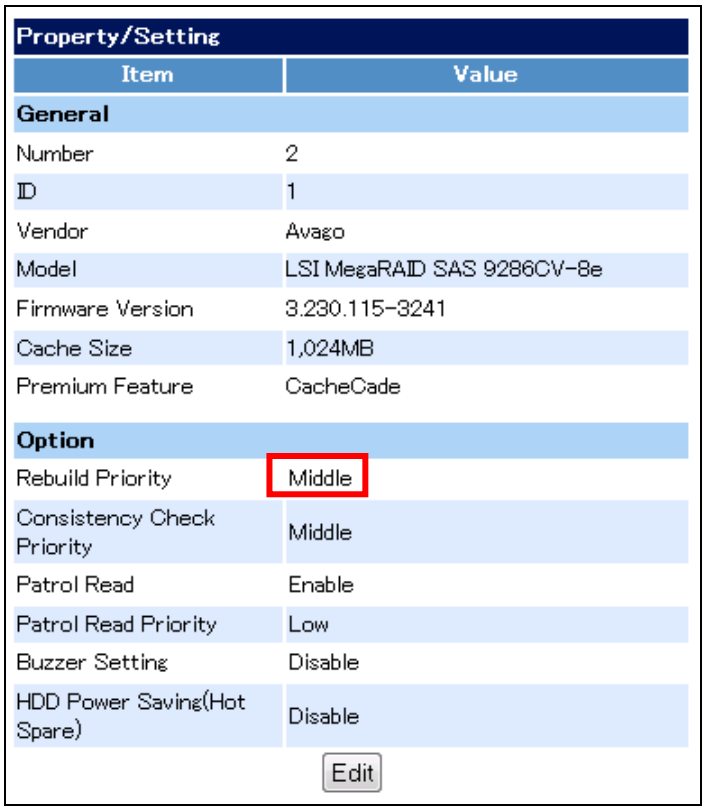
Step 3 In [Setting], change the value of [Rebuild Priority] to High, Middle, or Low. Click [Apply].



Step 4 The window confirming if you would like to apply. Click [OK].



After the change of the Rebuild Priority is finished successfully, the value of Rebuild Priority in [Property/Setting] will become that you have set.

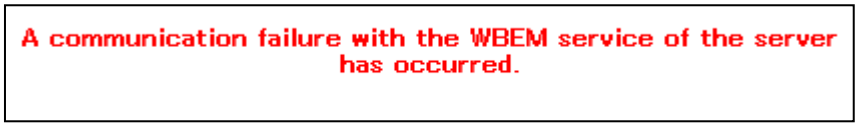


Property/Setting

Item	Value
General	
Number	2
ID	1
Vendor	Avago
Model	LSI MegaRAID SAS 9286CV-8e
Firmware Version	3.230.115-3241
Cache Size	1,024MB
Premium Feature	CacheCade
Option	
Rebuild Priority	Middle
Consistency Check Priority	Middle
Patrol Read	Enable
Patrol Read Priority	Low
Buzzer Setting	Disable
HDD Power Saving(Hot Spare)	Disable

Edit

If the change of Rebuild Priority fails, check the content displayed in the upper area of the screen. The following image is an example when the change fails



Reducing the power consumption of the Physical Device

The HDD Power Saving is the function to spin down the Physical Device that is not in use. The HDD Power Saving reduces the power consumption of the System by spinning down the Physical Device.

Set the Power Saving in each RAID Controllers.
You can see which type of the Physical Device is available for the HDD Power Saving function in the table below.

Device Type	Status		
	Ready	Online	Hot spare
Hard disk Drive (HDD)	N/A	N/A	✓
Solid State Drive (SSD)	N/A	N/A	N/A

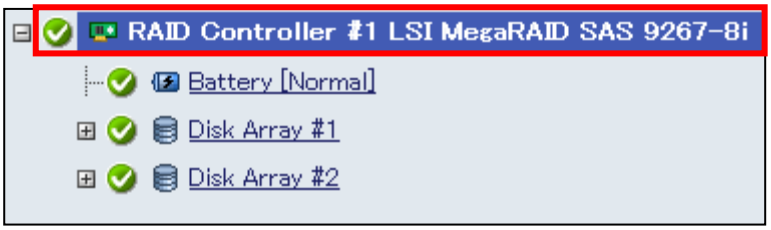
The settings for HDD Power Saving are available only in the Advanced Mode.

Setting Power Saving Device

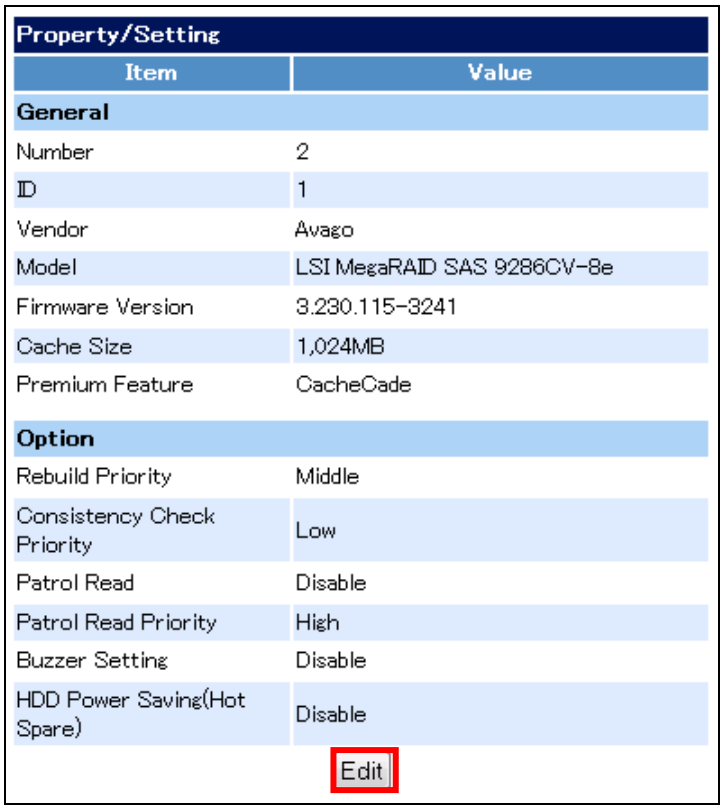
The procedure of setting the Power Saving Devices for each RAID Controller is described below.
The Physical Device that can see the HDD Power Saving function is the Hard Disk Drive of which the status is Hot Spare.

Some types of RAID Controller do not support this function. If it does not support this function, the items do not appear in Web GUI.

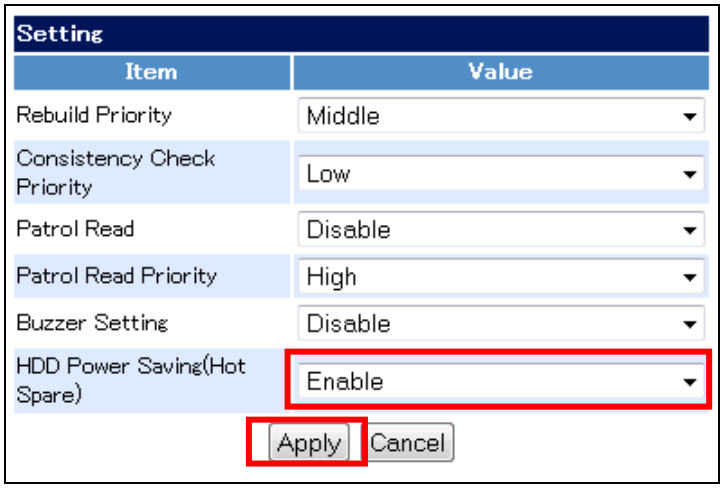
Step 1 Click the RAID Controller to set the HDD Power Saving (HotSpare) on the Local Navigation.



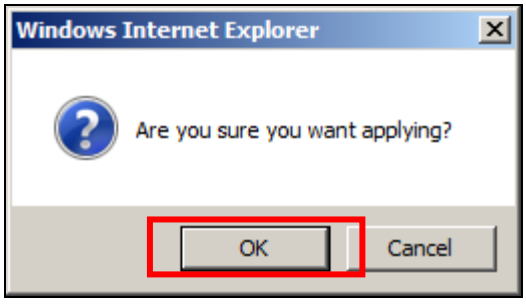
Step 2 Click [Edit] in [Property].



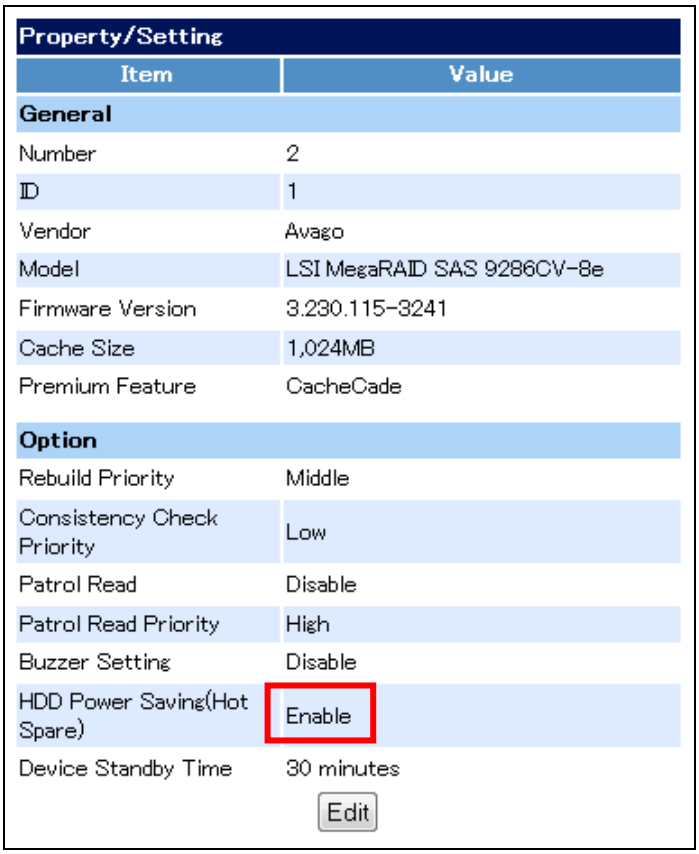
Step 3 Set the value for [HDD Power Saving (HotSpare)] in [Setting] and click [Apply].



Step 4 The window confirming if you would like to apply. Click [OK].



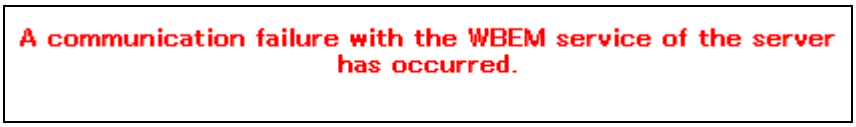
Step 5 After the change of the Device Standby Time is finished successfully, the value of HDD Power Saving (HotSpare) in [Property/Setting] will become that you have set.



Property/Setting	
Item	**Value**
General	
Number	2
ID	1
Vendor	Avago
Model	LSI MegaRAID SAS 9286CV-8e
Firmware Version	3.230.115-3241
Cache Size	1,024MB
Premium Feature	CacheCade
Option	
Rebuild Priority	Middle
Consistency Check Priority	Low
Patrol Read	Disable
Patrol Read Priority	High
Buzzer Setting	Disable
HDD Power Saving(Hot Spare)	Enable
Device Standby Time	30 minutes

Edit

Step 6 If the change of the HDD Power Saving (HotSpare) fails, check the content displayed in the upper area of the screen. The following image is an example when the change fails.



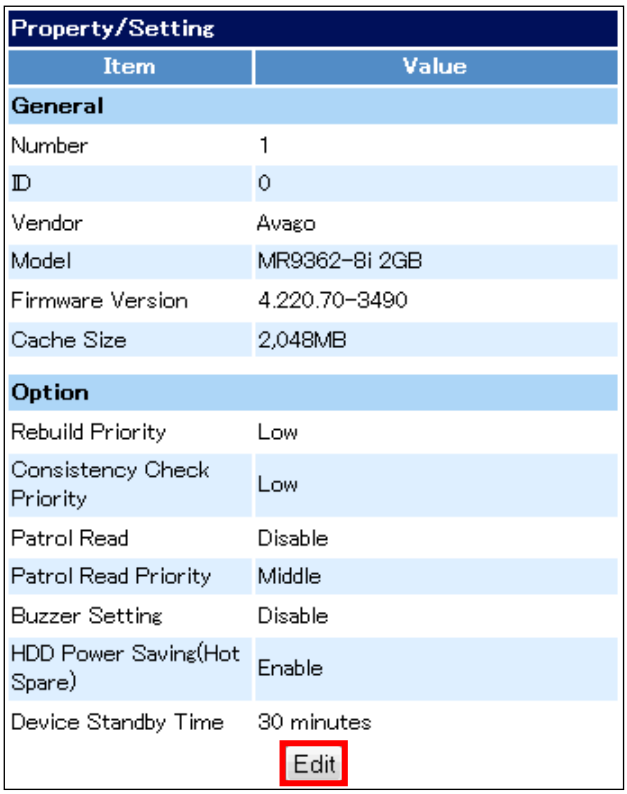
Setting Device Standby Time

Set the time of transitioning to Power Saving the Physical Device which is not in use.
You can select the time of transitioning from 30 minutes, 1 hour, 2 hours, 4 hours, and 8 hours.
The procedure of setting the Power Saving Devices for each RAID Controller is described below.

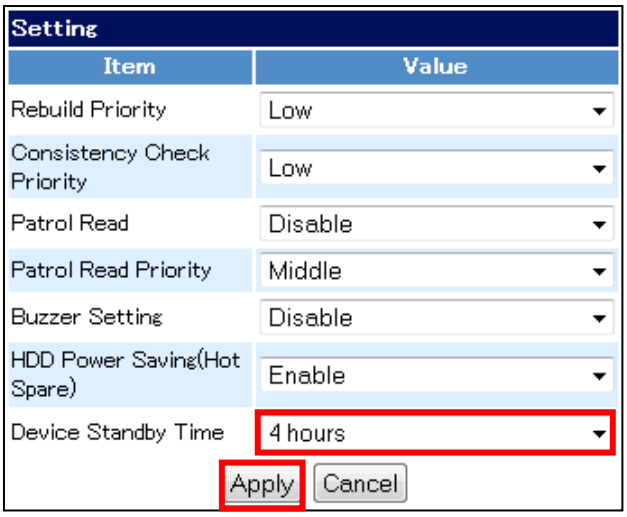
If HDD Power Saving is "disable", items [Device Standby Time] on the [Options] tab do not appear in Web GUI.

Step 1 Click the RAID Controller to set the Device Standby Time on the Local Navigation.

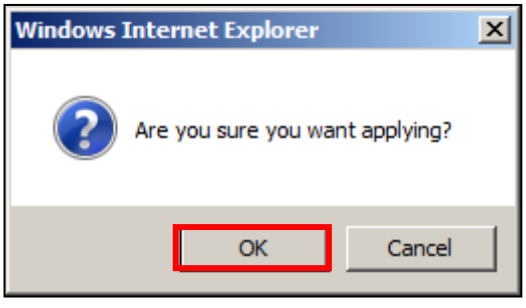
Step 2 Click [Edit] in [Property].



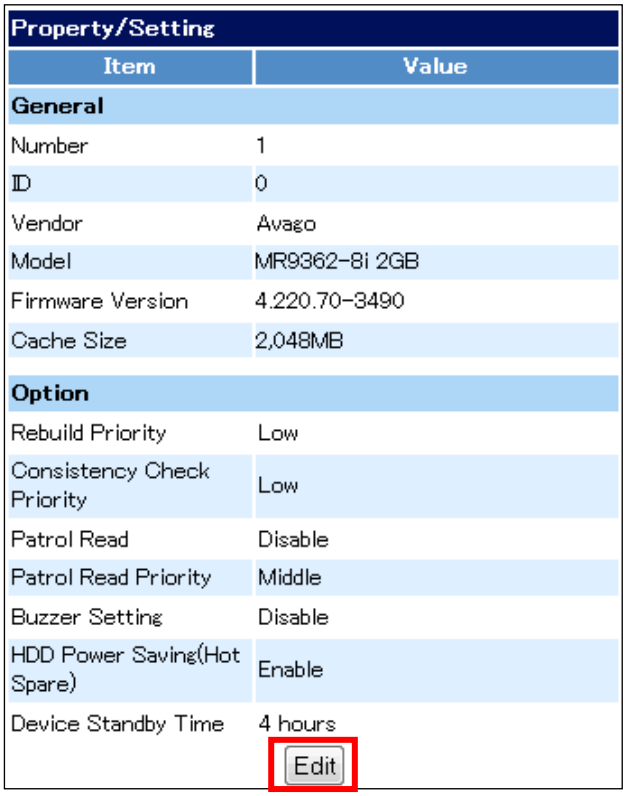
Step 3 Set the value for [Device Standby Time] in [Setting] and click [Apply].



Step 4 The window confirming if you would like to apply. Click [OK].



Step 5 After the change of the Device Standby Time is finished successfully, the value of Device Standby Time in [Property/Setting] will become that you have set.

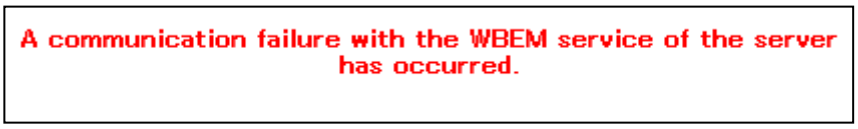


Property/Setting

Item	Value
General	
Number	1
ID	0
Vendor	Avago
Model	MR9362-8i 2GB
Firmware Version	4.220.70-3490
Cache Size	2,048MB
Option	
Rebuild Priority	Low
Consistency Check Priority	Low
Patrol Read	Disable
Patrol Read Priority	Middle
Buzzer Setting	Disable
HDD Power Saving(Hot Spare)	Enable
Device Standby Time	4 hours

Edit

If the change of the Device Standby Time fails, check the content displayed in the upper area of the screen. The following image is an example when the change fails.



Identifying Location of Physical Device

You can identify the location of Physical Devices by turning on (or blinking, depending on the type of the computer you are using) the DISK lamp of the computer or enclosure.

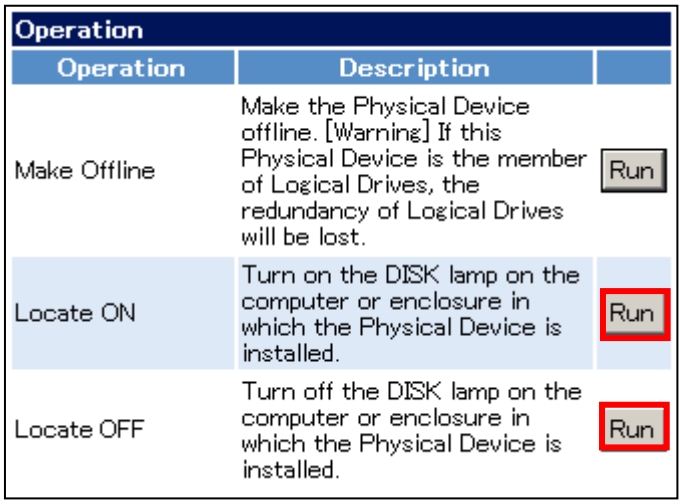
IMPORTANT **NEC ESMPRO Manager does not support the indication of the status (ON or OFF) of DISK lamp. Therefore, you can't recognize the location of the Physical Device when you turn ON the lamp of two or more Physical Devices at same time. You should turn ON the lamp of Physical Device one by one. It is convenient when you put down the number of the Physical Device which turned on a DISK lamp because you can confirm the number of the Physical Device when turn off the DISK lamp.**

Procedure of Checking Location of Physical Device

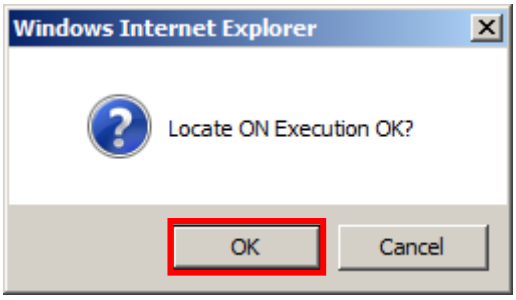
Locate is executed for a Physical Device. The locate procedure is described below.

Step 1 Click the Physical Device to identify the location in the Local Navigation.

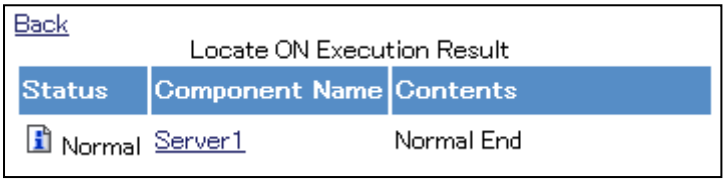
Step 2 Click [Run] for [Locate ON] or [Locate OFF] in [Operation] in the Operation Area.



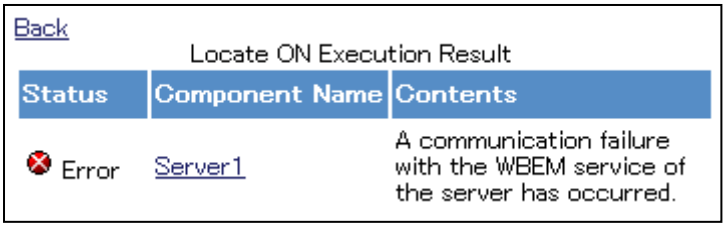
Step 3 The window confirming if you would like to perform [Locate ON] or [Locate OFF] will appear.



Step 4 The [Locate ON Execution Result] window will appear.
The following image is an example when [Locate ON] or [Locate OFF] is finished successfully.



The following image is an example when [Locate ON] fails. Check the Contents in the window.



Changing Status of Physical Device Forcibly

The function of changing status of a Physical Device forcibly can be used when you want to change the Status of a Physical Device to Online or Failed forcibly for a maintenance job or another. The function may not be used in normal operation.

IMPORTANT

- **The function of changing the status of a Physical Device forcibly is available only in the Advanced Mode.**
- **The system may not start if you forcibly change the status of the Physical Device used for the system drive. Do not change the status of the Physical Device used for the system drive forcibly.**

TIPS

The function of changing the status of a Physical Device forcibly may not be able to change the status to the desired one depending on the status of the Physical Device (such as a severe failure).

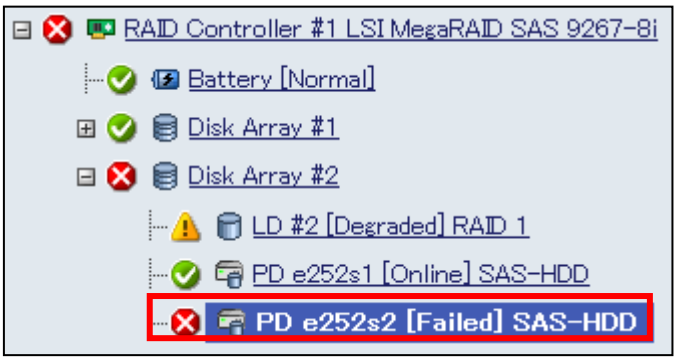
To Online Forcibly

To set the Status of a Physical Device to Online forcibly, use Make Online. The procedure of executing Make Online is described below.

IMPORTANT

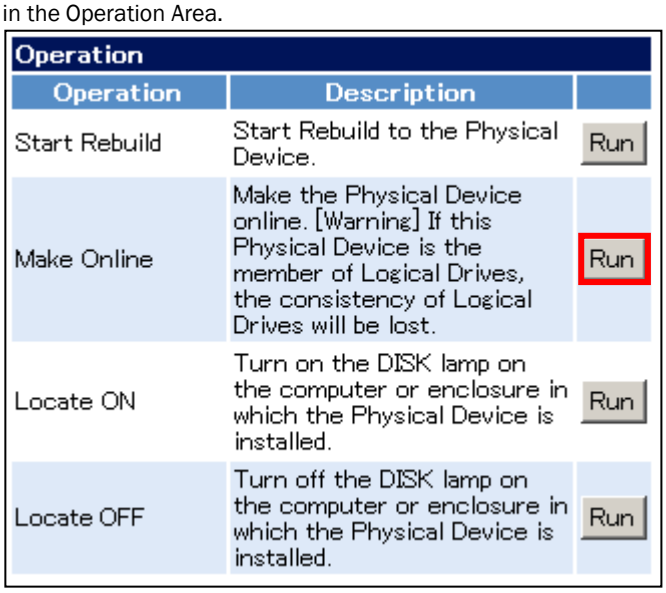
The consistency of Logical Drive will be lost if you forcibly change the status of the Physical Device used for the Logical Drive.

Step 1 Click the Physical Device of which the status is “Failed”.

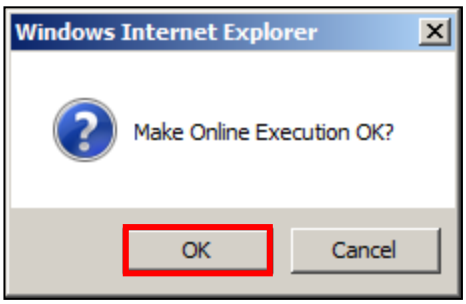


.

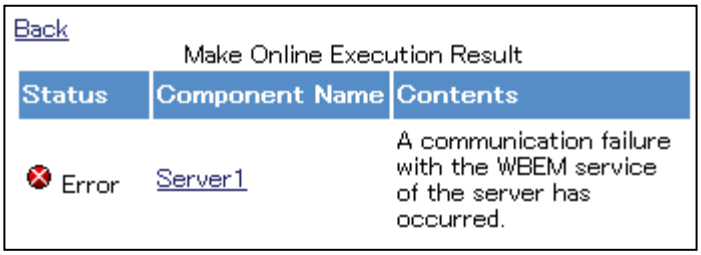
Step 2 Click [Run] for [Make Online] in [Operation] in the Operation Area.



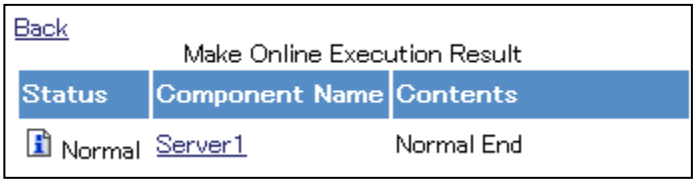
Step 3 The window confirming if you would like to make the Physical Device Online will appear. Click [OK].



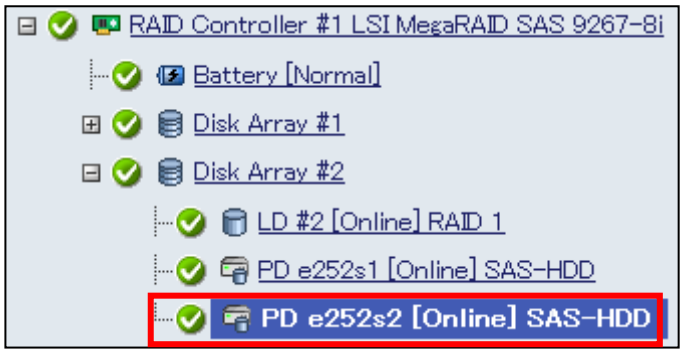
Step 4 If Make Offline is finished successfully, the [Make Online Execution Result] window will appear.



The following image is an example when it fails. Check the Contents of the window.



Step 5 The status of the Physical Device becomes Online from Failed.



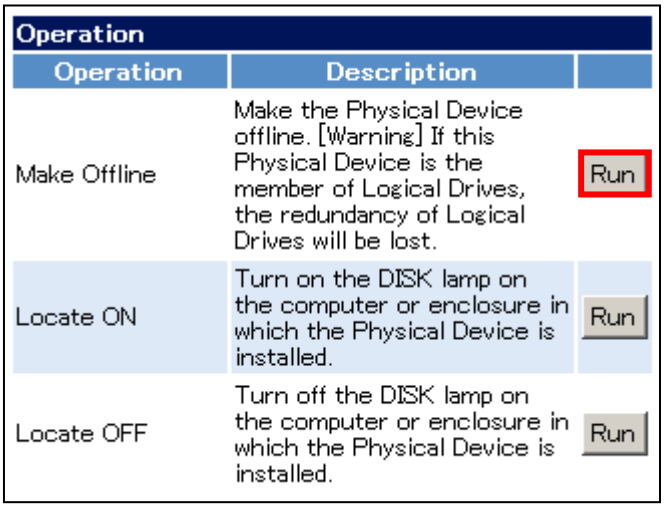
To Failed Forcibly

To set the Status of a Physical Device to Failed forcibly, use Make Offline. The procedure of executing Make Offline is described below.

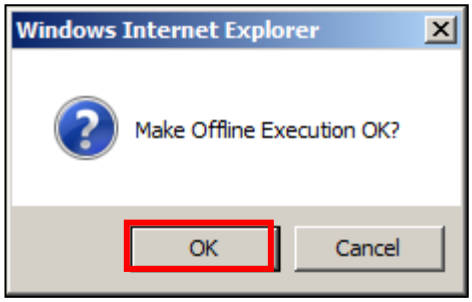
IMPORTANT **The redundancy of Logical Drive will be lost if you forcibly change the status of the Physical Device used for the Logical Drive.**

Step 1 Click the Physical Device of which the status is Online in the Local Navigation.

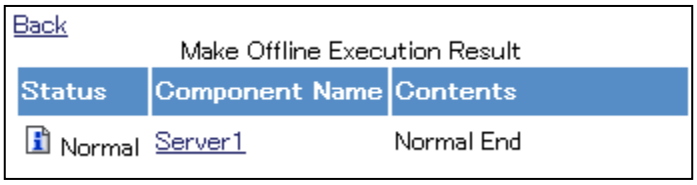
Step 2 Click [Run] for [Make Offline] in [Operation] in the Operation Area.



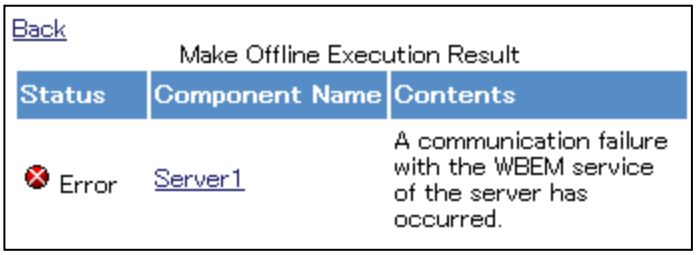
Step 3 The window confirming if you would like to make the Physical Device offline. Click [OK].



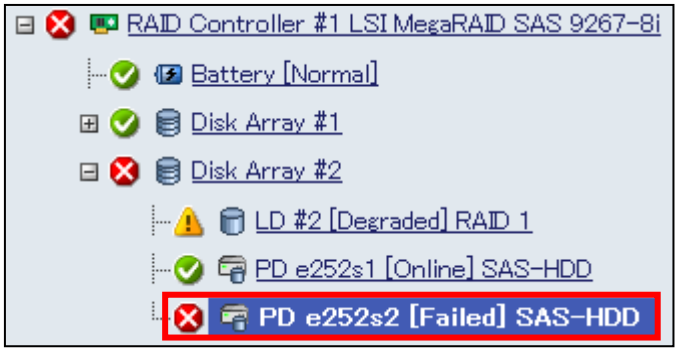
Step 4 The [Make Offline Execution Result] window will appear.
The following image is an example when Make Offline is finished successfully.



The following image is an example when Make Offline fails. Check the Contents of the window.



Step 5 After Make Offline is finished successfully, the status of the Physical Device becomes Failed from Online.



Refreshing the battery of the RAID Controller

The Refresh Battery is a function to refresh the battery connected to the RAID Controller. The function restores the battery degraded due to charge and discharge.
NEC ESMPRO Manager provides the function to manually execute the battery refreshing. The function can be done for each RAID Controller.
You can use a Windows task scheduler to do a regular battery refreshing.

> Some types of RAID Controller do not support Battery Refreshing.

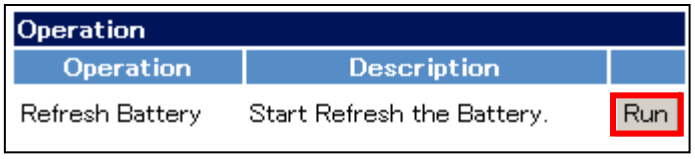
Executing Refresh Battery Manually

The procedure of executing the battery refreshing is described below.

> **The battery refreshing in manual is available only in the Advanced Mode.**

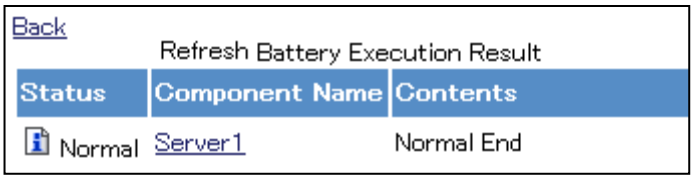
Step 1 Click the battery to refresh battery in the Local Navigation.

Step 2 Click [Run] for [Refresh Battery] in [Operation] in the Operation Area.

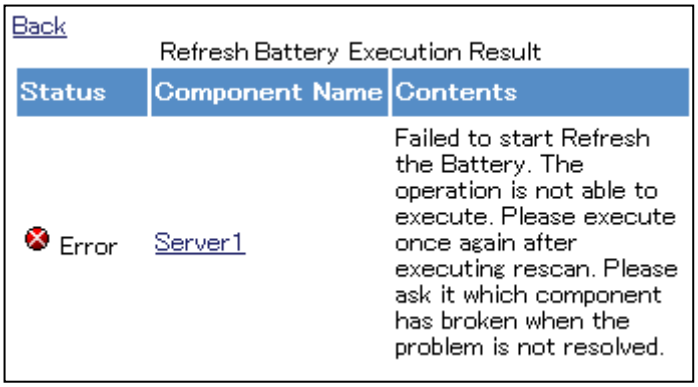


Step 3 The window confirming if you would like to refresh the battery. Click [OK].

Step 4 The [Refresh Battery Execution Result] window will appear.
The following image is an example when [Refresh Battery] is done successfully.



The following image is an example when [Refresh Battery] fails. Check the Contents of the window.



Making and Removing Hot Spare

The chapter describes the procedure to make or remove hot spare in NEC ESMPRO Manager.

Making Hot Spare

NEC ESMPRO Manager can make a Hot Spare to be replaced with a Physical Device in which a failure occurs.
Hot spares can have the following two modes.

Mode	Description
Global (Hot Spare)	Available as a Hot Spare of every Disk Array for a single RAID Controller.
Dedicated (Hot Spare)	Available as a Hot Spare of a specific Disk Array for a single RAID Controller.

In either mode, note the following to have a Hot Spare operate normally.

- The Physical Device used for rebuild should have the same the same capacity, rotation speed, and other specification as the defected Physical Device.
- The Physical Devices with the different size must be used as Dedicated Hot Spare..
- A Physical Device in which a S.M.A.R.T. error is detected cannot be used as a Hot Spare.
- The Physical Device whose SSD Endurance Remaining is “Running out (20-11%)”, “Need to replace (10% or less)” cannot be used as a Hot Spare.

The maximum number of Hot Spares that can be created depends on the RAID Controllers. See the user’s guide of the RAID Controller you are using.

About Global Hot Spare

Global Hot Spare is a Hot Spare for all the Disk Arrays under a single RAID Controller.

Ex.1 : If you make the Global Hot Spare on the RAID Controller which has Disk Arrays #1 and #2, the Global Hot Spare is a Hot Spare of Disk Arrays #1 and #2.

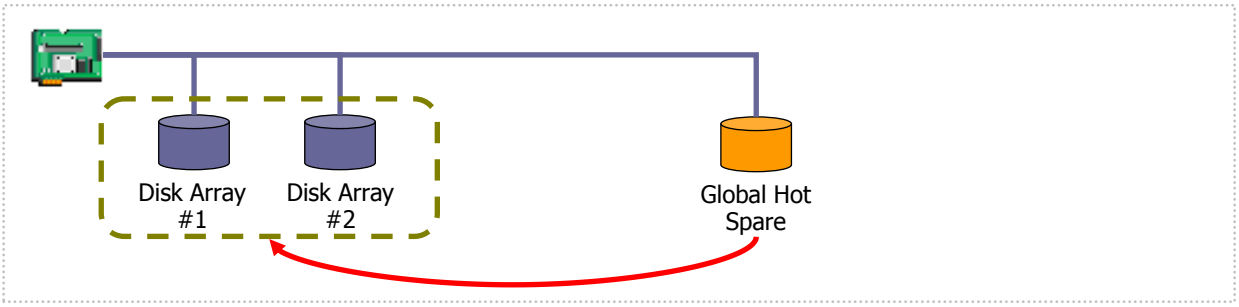


Figure 3 Global Hot Spare 1

Ex.2 : If you create the Disk Array #3 on the RAID System of Ex.1, the Global Hot Spare is a Hot Spare for the Disk Array #3 too.

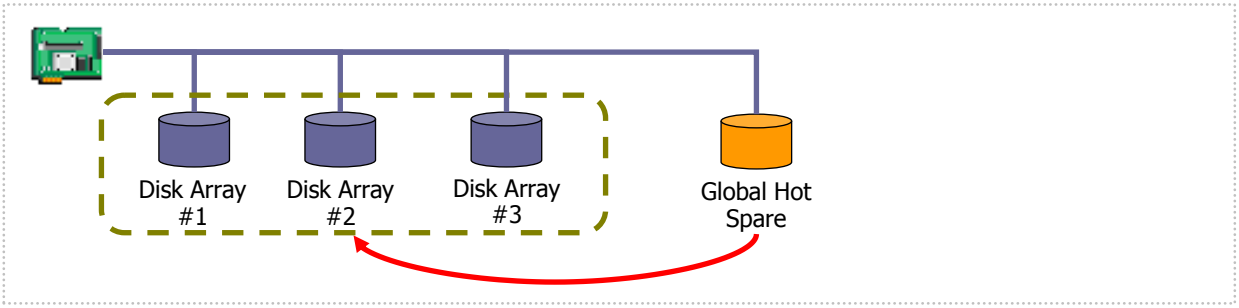


Figure 4 Global Hot Spare 2

About Dedicated Hot Spare

Dedicated Hot Spare is a Hot Spare for the specified Disk Arrays under a single RAID Controller. The Dedicated Hot Spare has the following features:

- Dedicated Hot Spare is a Hot Spare for specified Disk Arrays.
- One or more Dedicated Hot Spare can be a Hot Spare for one or more Disk Arrays.

CHECK

- Dedicated Hot Spares cannot be created in a Disk Array containing Logical Drives with the RAID Level being RAID 0.
- Dedicated Hot Spares cannot be created in a Disk Array which does not have any Logical Drive.
- Dedicated Hot Spare can be created by a Physical Device as which a Physical Device of the same Interface Type, Device Type, and Sector Format to create the Disk Array.

Ex 1 : You make the Dedicated Hot Spare on the RAID Controller which has Disk Arrays #1 and #2. If you specify only the Disk Array #1 as the target Disk Array, the Dedicated Hot Spare is a Hot Spare of Disk Array #1.

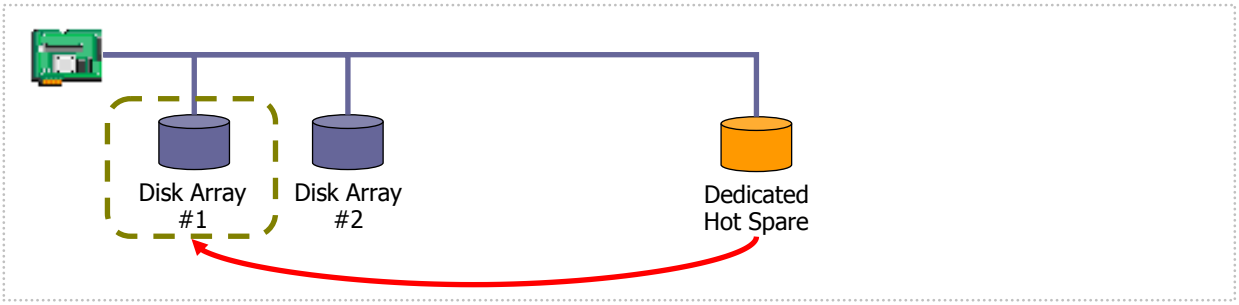


Figure 5 Dedicated Hot Spare 1

Ex 2 : In case of the RAID System in Ex1, you can add more Dedicated Hot Spare . If you add the Dedicated Hot Spare #2 to the Disk Array #1, the both Dedicated Hot Spare are the Hot Spare for the Disk Array #1.

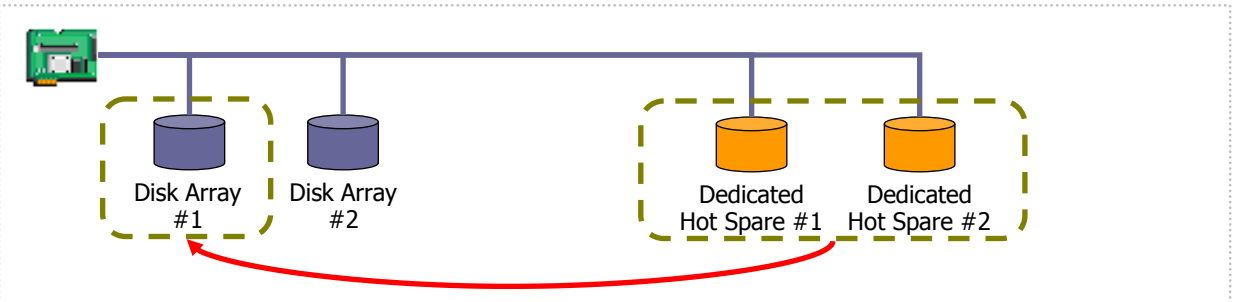
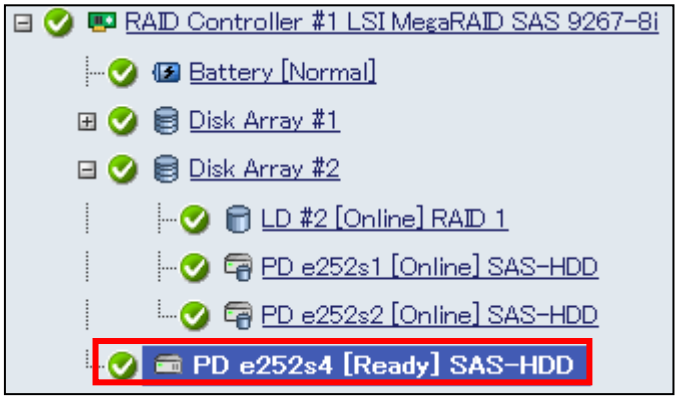


Figure 6 Dedicated Hot Spare 2

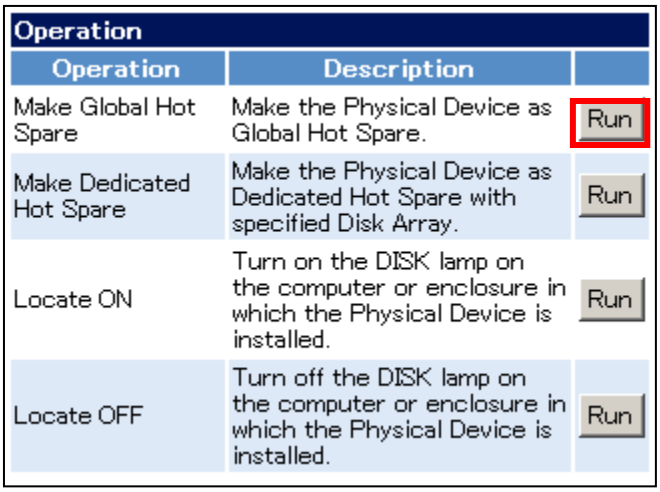
Creating Global Hot Spare

The procedure of making a Global Hot Spare is described below.

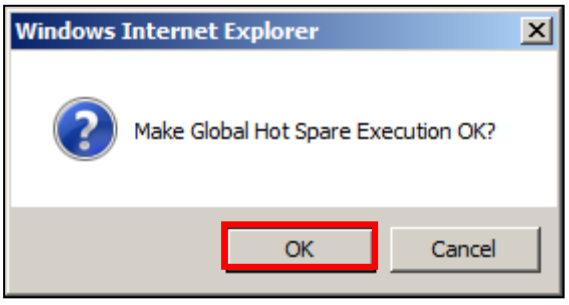
Step 1 Click the Physical Device to make a Global Hot Spare in the Local Navigation.



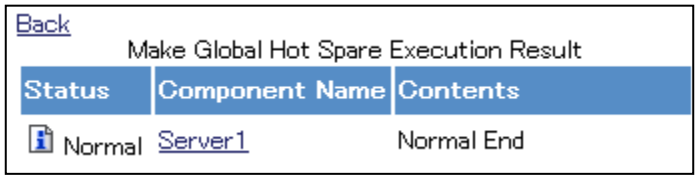
Step 2 Click [Run] for [Make Global Hot Spare] in [Operation] in the Operation Area.



Step 3 The window confirming if you would like to make a global hot spare will appear. Click [OK].

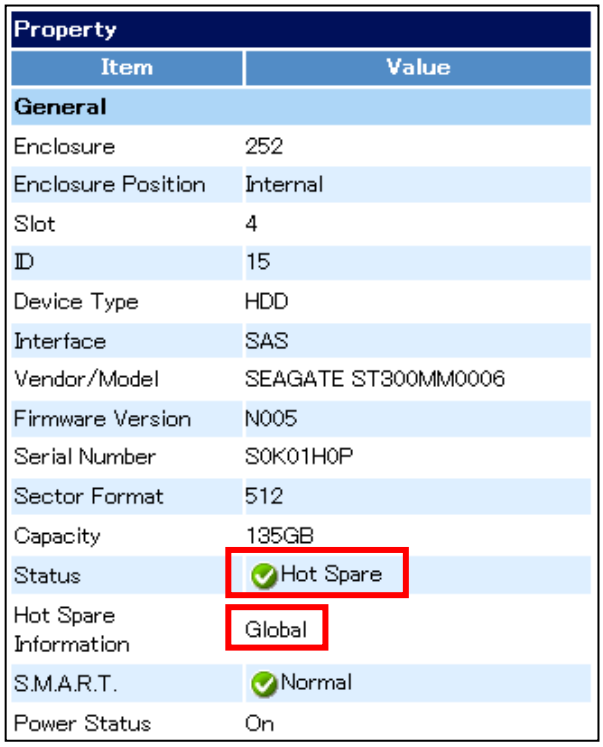


Step 4 The [Make Global Hot Spare Execution Result] window will appear.
The following image is an example when making hot spare is done successfully.



The following image is an example when it fails. Check the Contents of the window.

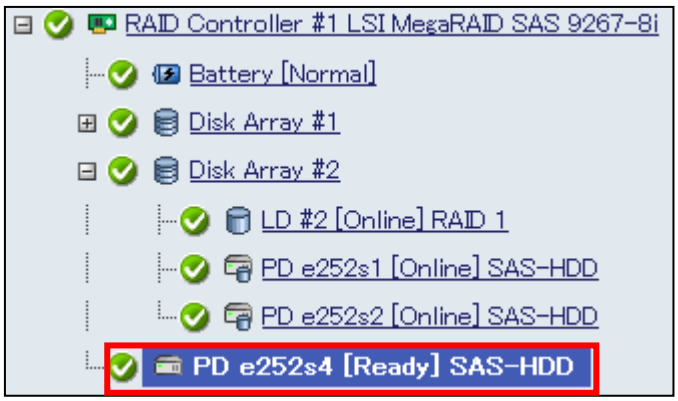
Step 5 After making a hot spare is finished successfully, the status of the Physical Device becomes [Hot Spare] and [Hot Spare Information] will appear with the value “Global”.



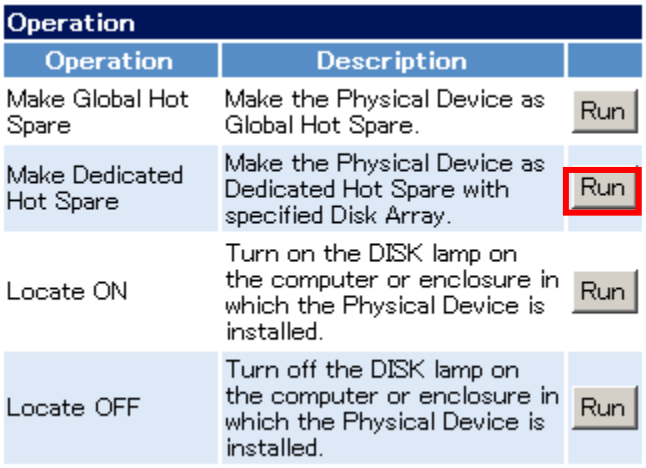
Making Dedicated Hot Spare

The procedure of making a Dedicated Hot Spare is described below.

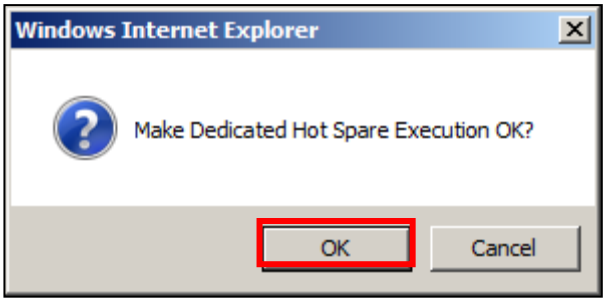
Step 1 Click the Physical Device to make a dedicated hot spare in the Local Navigation.



Step 2 Click [Run] for [Make Dedicated Hot Spare] in [Operation] in the Operation Area.

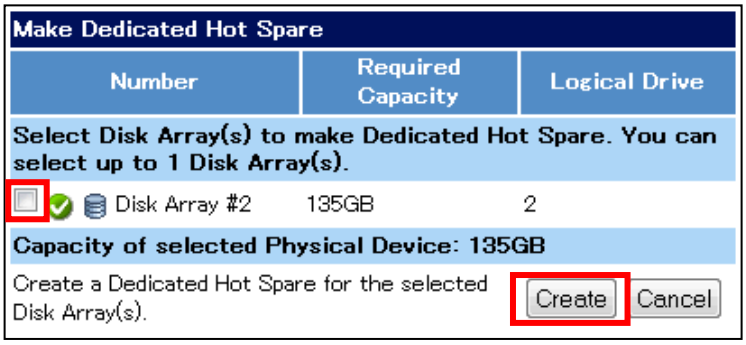


Step 3 The window confirming if you would like to make a dedicated hot spare. Click[OK].

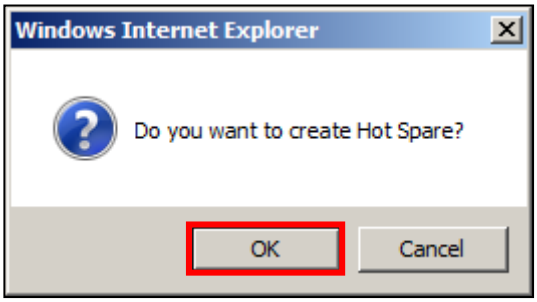


Step 4 The [Make Dedicated Hot Spare] window will appear. Check the check box of the Disk Array for which a Dedicated Hot Spare is to be made. The Dedicated Hot Spare may be made for more than one Disk Array. The capacity of the Physical Device to be used as a Hot Spare must be the same as that of the Physical Device being used in the target Disk Array.

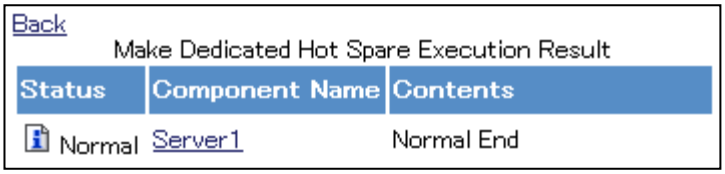
Click [Create] to make the Dedicated Hot Spare.



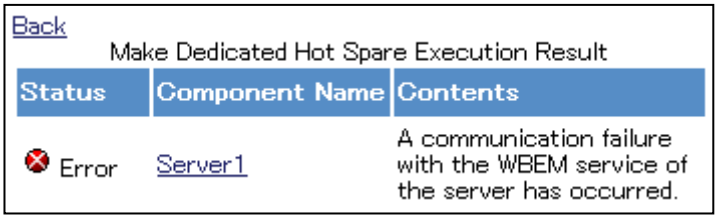
Step 5 The window confirming if you would like to create a Dedicated Hot Spare will appear. Click [OK].



Step 6 The [Make Dedicated Hot Spare Execution Result] window will appear.
The following image is an example when the Dedicated Hot Spare is created successfully.



The following image is an example when it fails. Check the Contents of the window.



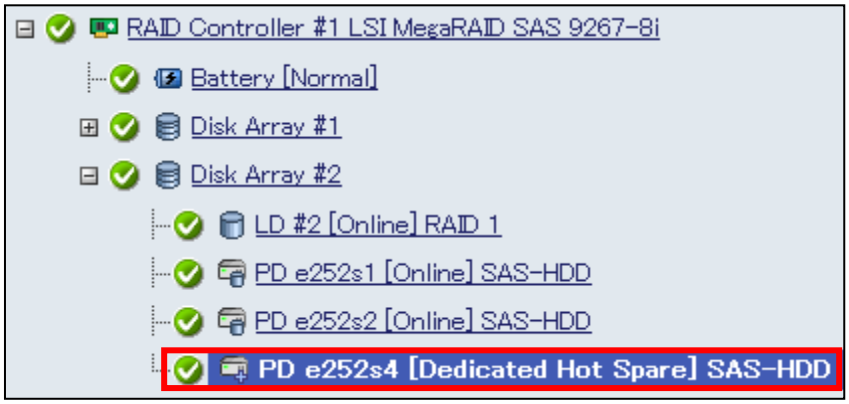
Step 7 If the Dedicated Hot Spare is created successfully, the status of the Physical Device becomes [Hot Spare] and the [Hot Spare Information] item will appear with the value of “Dedicated (Disk Array #X)”.

Property	
Item	**Value**
General	
Enclosure	252
Enclosure Position	Internal
Slot	4
ID	15
Device Type	HDD
Interface	SAS
Vendor/Model	SEAGATE ST300MM0006
Firmware Version	N005
Serial Number	S0K01H0P
Sector Format	512
Capacity	135GB
Status	Hot Spare
Hot Spare Information	Dedicated (Disk Array #2)
S.M.A.R.T.	Normal
Power Status	On

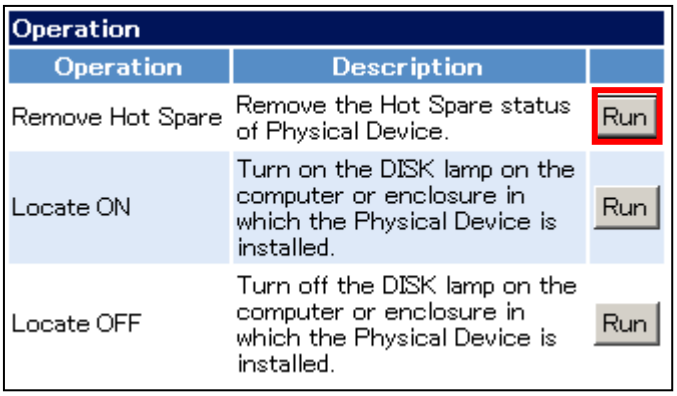
Removing Hot Spare

The procedure of removing a Hot Spare is described below.
The following procedure is for removing a Dedicated Hot Spare. You can also remove a Global Hot Spare in the similar procedure.

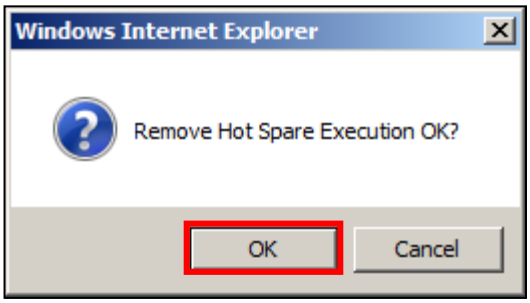
Step 1 Click the Physical Device to remove a hot spare in the Local Navigation.



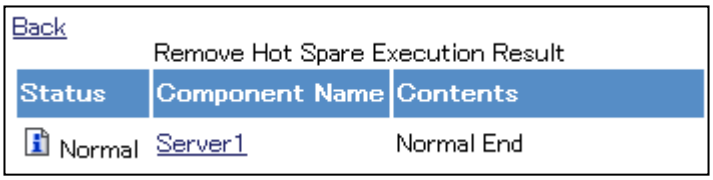
Step 2 Click [Run] for [Remove Hot Spare] in [Operation] in the Operation Area.



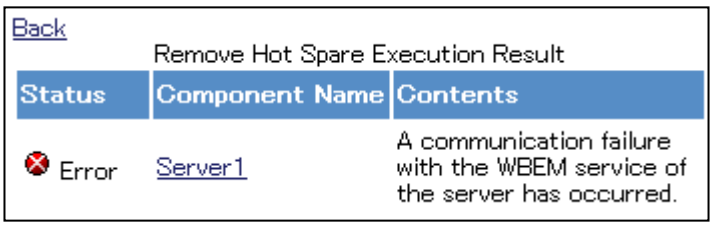
Step 3 The window confirming if you would like to remove a Hot Spare will appear. Click [OK].



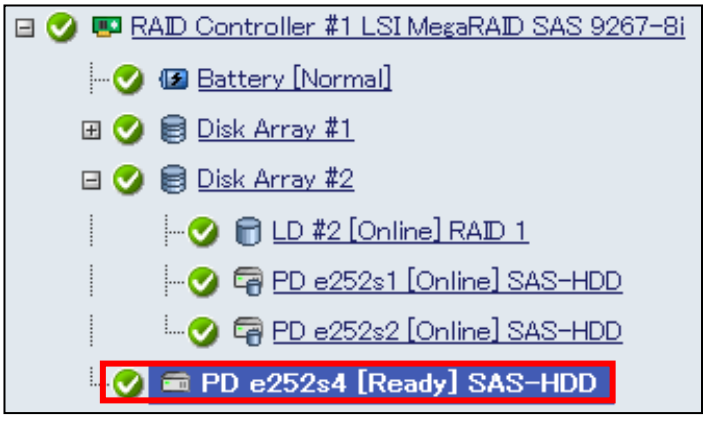
Step 4 The [Remove Hot Spare Execution Result] window will appear.
The following image is an example when removing a hot spare is finished successfully.



The following image is an example when it fails. Check the Contents of the window.



Step 5 After a Hot Spare is removed successfully, the status of the Physical Device will become [Ready].



Troubleshooting RAID System

This chapter describes the troubleshooting of a RAID System done by using NEC ESMPRO Manager.
NEC ESMPRO Manager provides various measures to monitor occurrences of failures in the RAID System. The figure below shows the image of the troubleshooting function provided by NEC ESMPRO Manager.

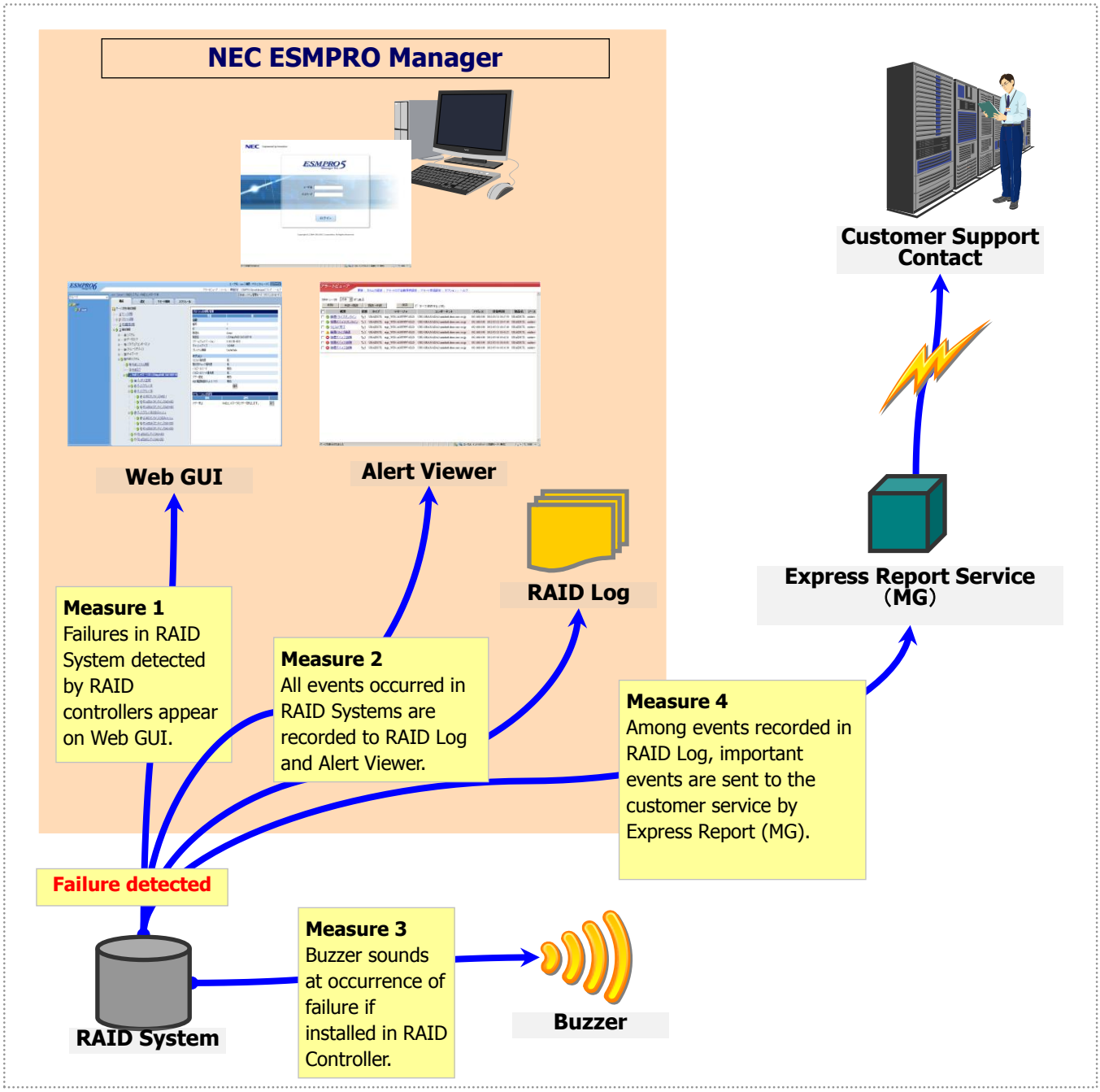


Figure 7 Troubleshooting image of RAID System

Failure Detection Measures

NEC ESMPRO Manager provides several fault detection measures as shown in Figure 7 Troubleshooting image of RAID System. The measures are described below.

Status Display by Web GUI

Web GUI indicates the status of the RAID System with the icons of components on the Local Navigation and the [Status] in the Property tab of each component.
For details of the icons of components on the Local Navigation, see "Structure of Web GUI".
See "Referring to Information on RAID System" about details of [Status] in the Property tab.

Logging Events to RAID Log

NEC ESMPRO Manager logs all events occurred in the RAID System to the RAID Log.
The data in the RAID Log can be seen on Web GUI.

Logging Events to Alert Viewer

NEC ESMPRO Manager logs all events occurred in the RAID System to the Alert Viewer.
For the function of Alert Viewer, see the online help of NEC ESMPRO Manager.

Logging Events by Express Report Service (MG)

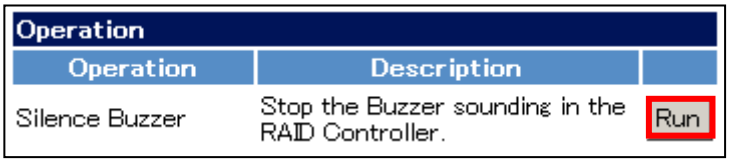
Among RAID System events logged in the RAID Log, Express Report Service (MG) logs important events to the customer support contact.
For events to be logged in the OS log, see the user's guide of the computer or Express Report Service (MG) Installation Guide.

Buzzer in RAID Controller

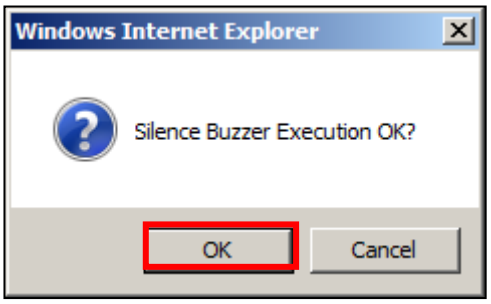
If a RAID Controller is equipped with a Buzzer, the RAID Controller sounds the Buzzer for some types of failures occurred.
The Buzzer sounds until the stopping it manually. This section describes how to stop the Buzzer.

Step 1 Check the component in which a failure occurs on the Local Navigation.

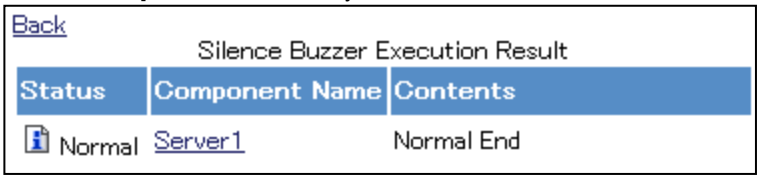
Step 2 Click the RAID Controller containing the component in which the failure occurs. Click [Run] for [Silence Buzzer] in [Operation] in the Operation Area.



Step 3 The window confirming if you would like to silence the buzzer. Click [OK].



Step 4 The [Silence Buzzer Execution Result] window will appear. If [Silence Buzzer] is done successfully, the Buzzer turns off.
The following image is an example when [Silence Buzzer] is done successfully.



- You can click menu item [Silence Buzzer] whether a Buzzer sounds or not. Nothing is done if no Buzzer sounds.
- [Buzzer Setting] for the RAID Controller must be Enable in advance to sound the buzzer.

Monitoring Faults of Physical Devices

NEC ESMPRO Manager can take the following measures to monitor failures of Physical Devices detected by RAID Controllers.

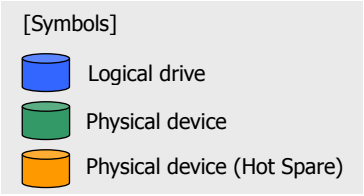
Web GUI	RAID Log	Buzzer	Alert Viewer	Express Report
✓	✓	Depending on type of RAID Controller	✓	✓

If a Physical Device used for a Logical Drive is failed, the status of the Physical Device changes to [Failed].
In addition, the status of the Logical Drive using the Physical Device changes to [Degraded] or [Offline] depending on the redundancy. The status of the Physical Device and Logical Drive remains unchanged until the problem is solved.

> If the Physical Device (SSD) used for CacheCade fails, the status of the Physical Device (SSD) goes to Failed and the capacity of the SSD Cache Drive of which Physical Device (SSD) consists.
>
> The SSD Cache Drive operates as a read-ahead cache of HDD. If any one of the Physical Devices (SSD) goes online, the status of the SSD Cache Drive becomes [Online].

Web GUI indicates the status of Physical Devices and Logical Drives with their icons on the Local Navigation and Operation Area. In addition, Web GUI shows the status from the viewpoint of the RAID System and from the viewpoint of the server on the Local Navigation.

The display of Web GUI depending on the change of Physical Device status is described below.



Operation in no failures of Physical Devices

If all Physical Devices used by a Logical Drive operates normally (with their [Status] being [Online]), the Logical Drive is in the online status (with its [Status] being [Online]).

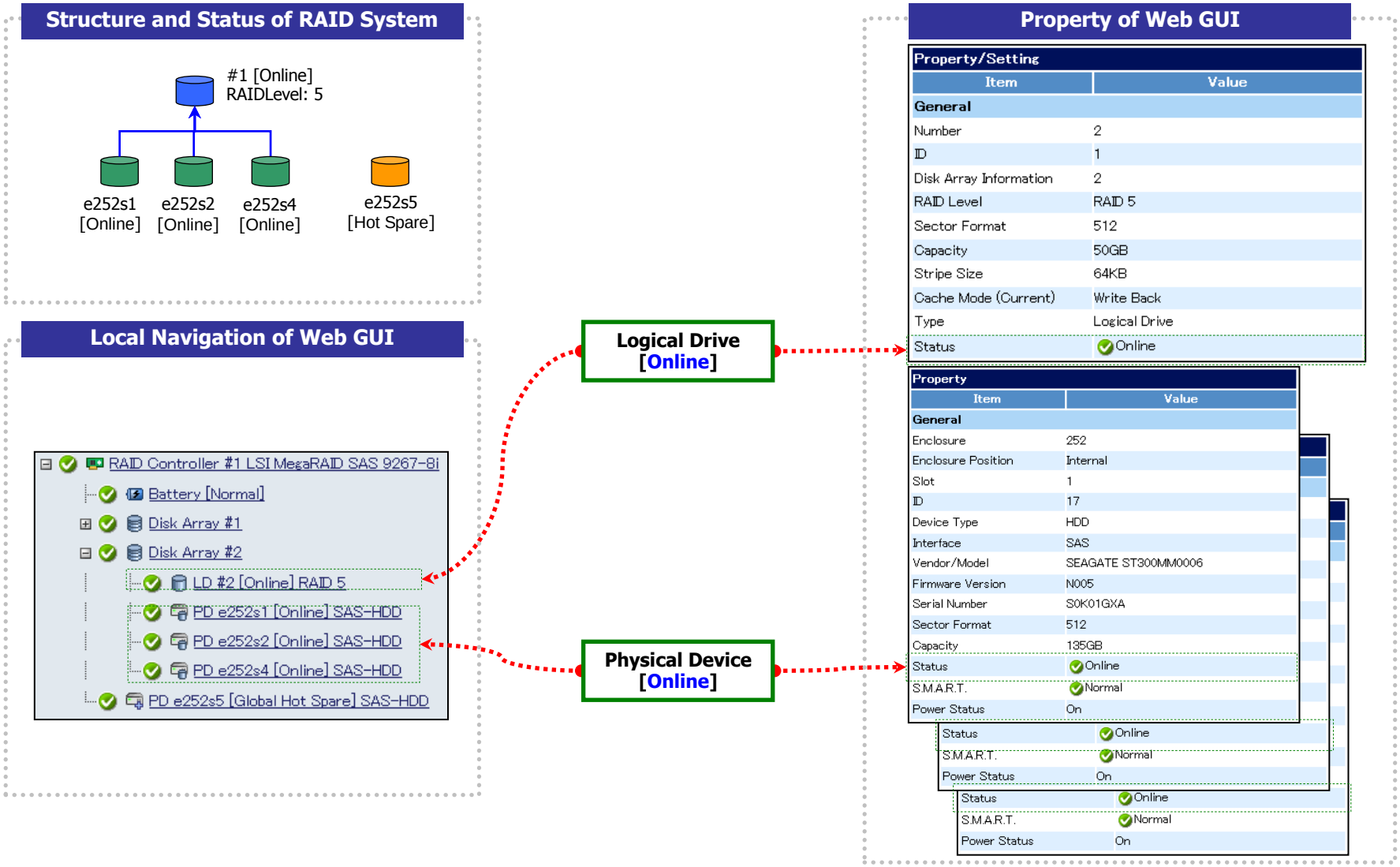


Figure 8 Display of Web GUI (No failures of Physical Devices)

Operation when redundancy of Logical Drive degraded or lost due to failure of Physical Device

If one or more Physical Devices used by a Logical Drive are failed (with their [Status] being [Failed]) to degraded (one Physical Device of RAID Level 6 is failed) or lost (one Physical Device of RAID Level 1 or 5 is failed, two Physical Devices of RAID Level 6 is failed) the redundancy of the Logical Drive, the Logical Drive is degraded (with its [Status] being [Degraded]).

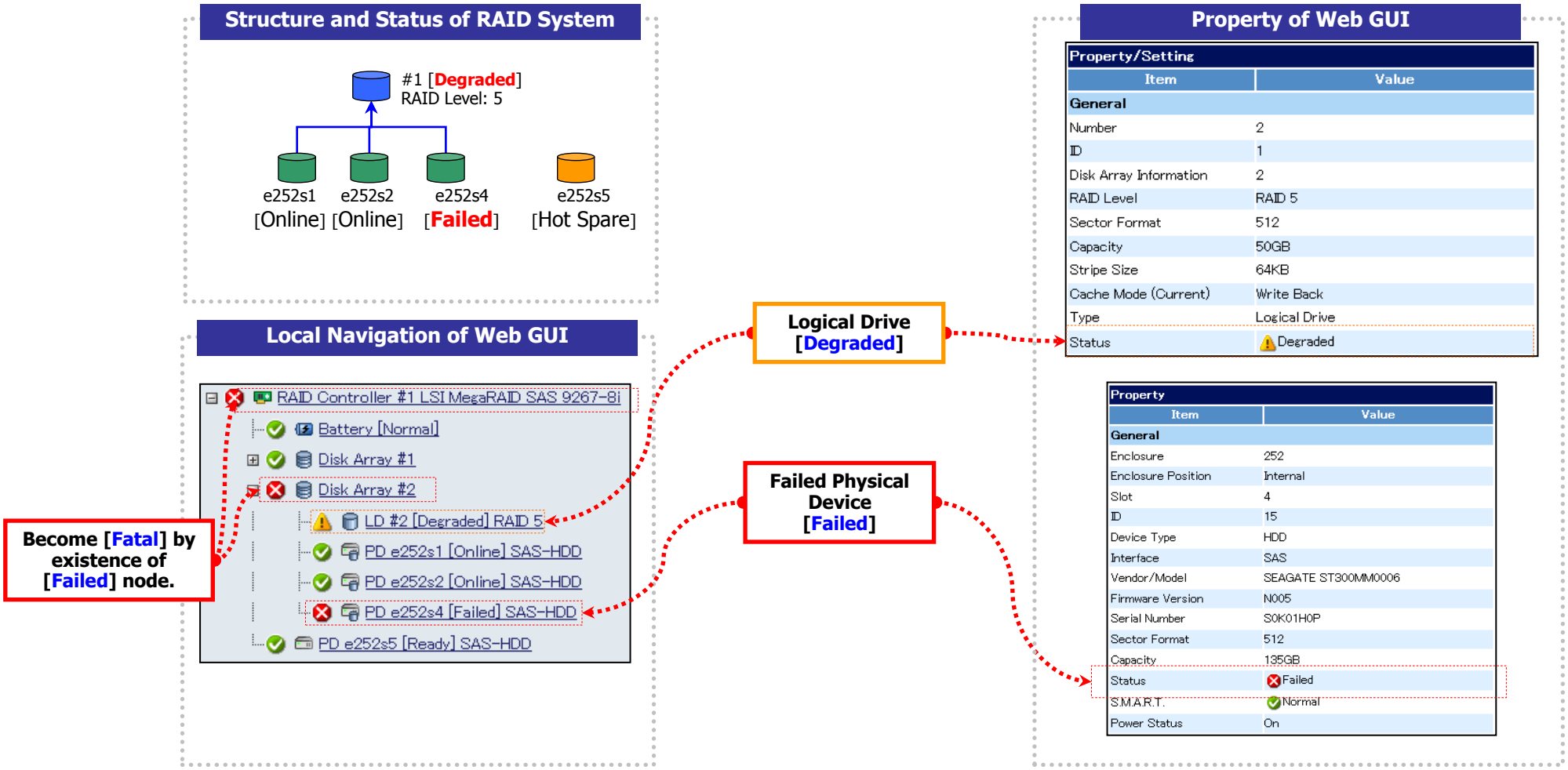


Figure 9 Display of Web GUI (Lost the redundancy of Logical Drive)

Operation when failed Physical Device is replaced to recover RAID System

Using the RAID System continuously with the redundancy of a Logical Drive remaining degraded may cause the data in the Logical Drive to be lost when another Physical Device is failed further. Recover a Logical Drive of degraded redundancy by Hot Spare or replacement of the failed Physical Device.
If Hot Spare or replacement of a failed Physical Device operates Rebuild, the status of the Physical Device changes during the rebuilding (with its [Status] changed to [Rebuilding]).

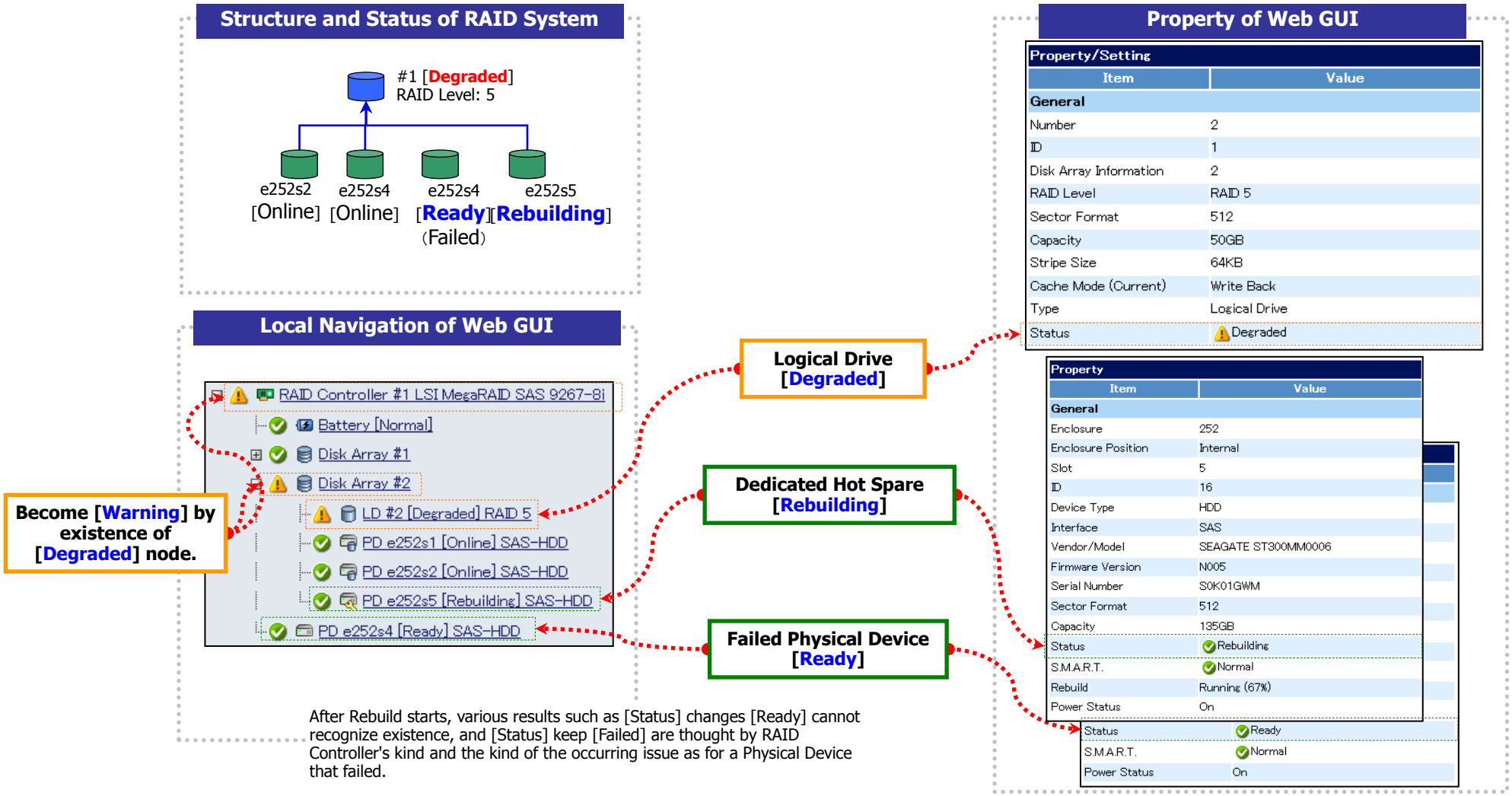


Figure 10 Display of Web GUI (Rebuilding of Physical Device)

Operation when the Logical Drive is offline due to failure of Physical Device

If you continue to use the RAID System with lost redundancy of a Logical Drive and another Physical Device is failed further, the redundancy of the Logical Drive is lost completely (two or more Physical Devices of RAID Level 1 or 5 is failed, three or more Physical Devices of RAID Level 6 is failed). The status of a Logical Drive without redundancy is offline (with its [Status] being [Offline]). The data in a Logical Drive in the offline status is lost. Replace all failed Physical Devices and Rebuild the RAID System.

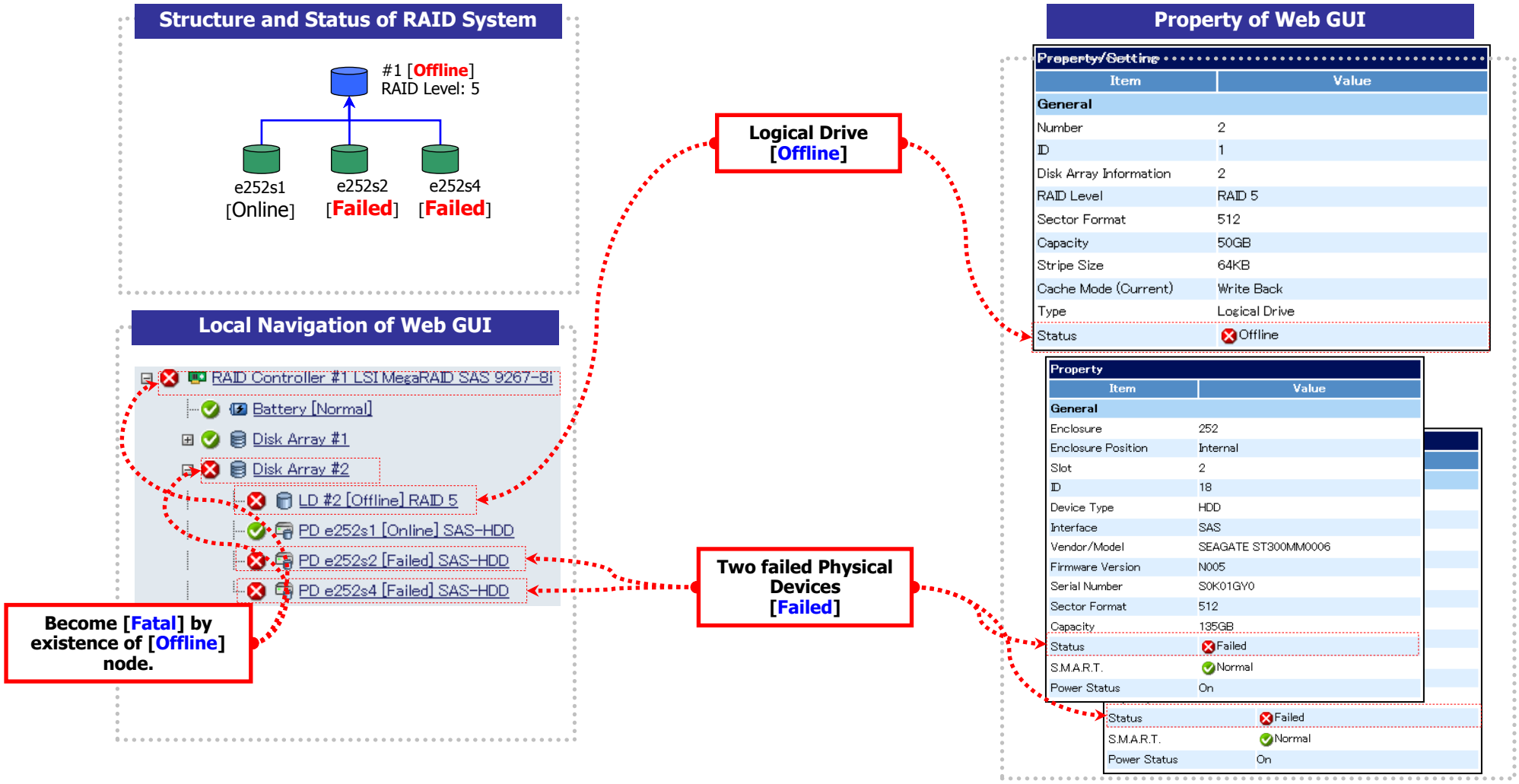


Figure 11 Display of Web GUI (Under lost redundancy of Logical Drive)

Monitoring Battery Status

NEC ESMPRO Manager can monitor Battery status which the RAID Controller detects by the following means.

Web GUI	RAID Log	Buzzer	Alert Viewer	Express Report
✓	✓	Depending on type of RAID Controller	✓	✓

NEC ESMPRO Manager monitors events of the Battery installed in the RAID Controller. NEC ESMPRO Manager logs detected Battery events in the RAID Log. Any event indicating occurrence of a problem in the Battery reflects to the [Status] of Battery on Web GUI (changes the status to [Warning]). The Battery status is retailed until the problem is solved.

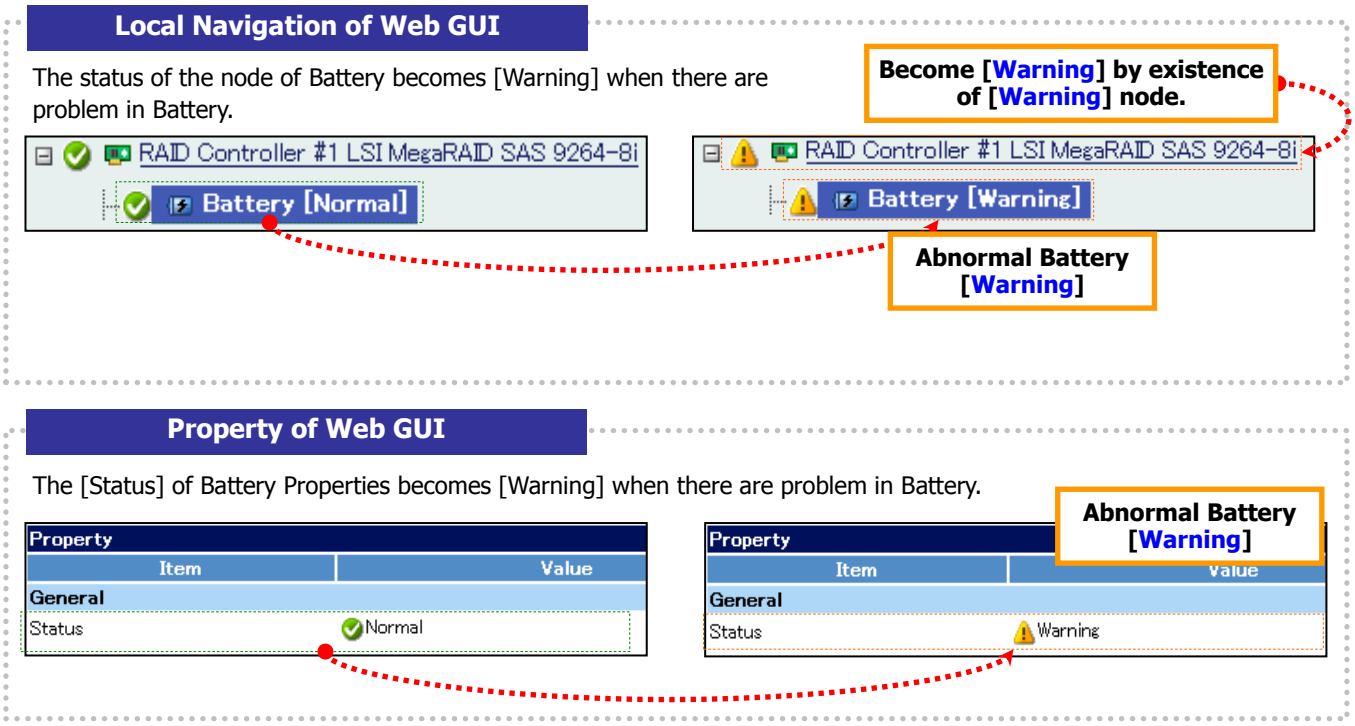


Figure 12 Display of Web GUI (Abnormal Battery operation)

Monitoring Flash Backup Unit Status

NEC ESMPRO Manager can monitor Flash Backup Unit status which the RAID Controller detects by the following means.

Web GUI	RAID Log	Buzzer	Alert Viewer	Express Report
✓	✓	Depending on type of RAID Controller	✓	✓

NEC ESMPRO Manager monitors events of the Flash Backup Unit installed in the RAID Controller. NEC ESMPRO Manager logs detected Flash Backup Unit events in the RAID Log. Any event indicating occurrence of a problem in the Flash Backup Unit reflects to the [Status] of Flash Backup Unit on Web GUI (changes the status to [Warning]). The Flash Backup Unit status is retailed until the problem is solved.

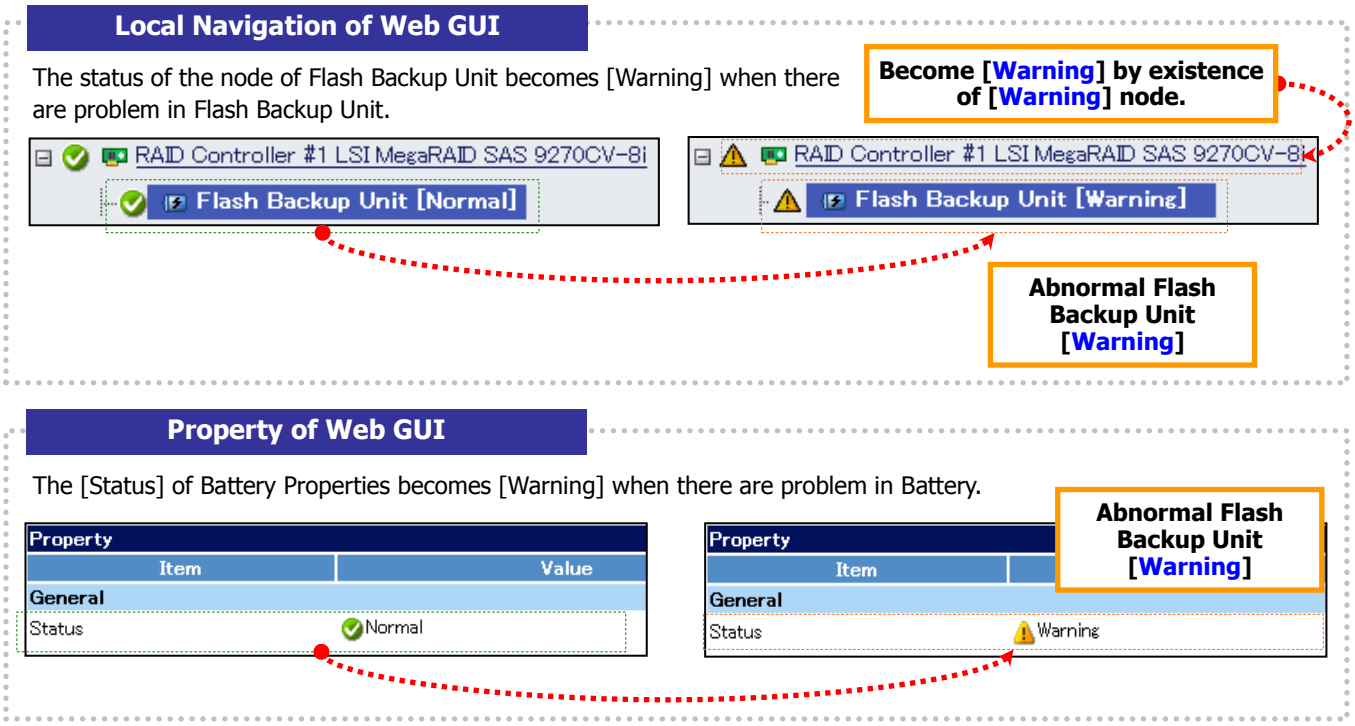


Figure 133 Display of Web GUI (Abnormal Flash Backup Unit operation)

Monitoring Enclosure Status

NEC ESMPRO Manager can monitor enclosure status which the RAID Controller detects by the following means.

Web GUI	RAID Log	Buzzer	Alert Viewer	Express Report
	✓	Depending on type of RAID Controller	✓	✓

NEC ESMPRO Manager monitors events of the enclosure detected by the RAID Controller. NEC ESMPRO Manager logs detected enclosure events to the RAID Log. In addition, NEC ESMPRO Manager records important event to the Alert Viewer and sends alerts to the Express Report (MG).
The severities of the events in this category are not reflected to Local Navigation of Web GUI and the property of RAID System.

See " Appendix B : Logs/Events " for detail about the event of enclosure.

Monitoring Medium Error on Physical Device

NEC ESMPRO Manager can monitor enclosure status which the RAID Controller detects by the following means.

Web GUI	RAID Log	Buzzer	Alert Viewer	Express Report
	✓		✓	✓

NEC ESMPRO Manager monitors events of Medium Error on Physical Device. NEC ESMPRO Manager logs detected Medium Error events to the RAID Log. In addition, NEC ESMPRO Manager registers a “Physical Device Medium Error Frequently Detected” event message into RAID log when “Physical Device Medium Error (Correctable)” event occurs 20 or more times within one hour on the same Physical Device.
And also, NEC ESMPRO Manager registers a “Physical Device Medium Error Intermittently Detected” event message into RAID log when “Physical Device Medium Error (Correctable)” event occurs 20 or more times within a week on the same Physical Device. When this event message is registered, please replace the Physical Device.

If Patrol Read or Consistency Check is executed when “Physical Device Medium Error Frequently Detected” event occurs, the Patrol Read or the Consistency Check is automatically stopped to suppress deterioration of access performance to the Physical Device. If you want to execute Consistency Check through entire Logical Drive even if a Medium Error is detected frequently, use [Consistency Check (Automatic Stop disabled)]. See the section “Checking Logical Drive Consistency”.

See " Appendix B : Logs/Events " for detail about the event of Medium Error on Physical Device.

Monitoring Various Events of RAID System

NEC ESMPRO Manager can monitor other events which the RAID Controller detects by the following means.

Web GUI	RAID Log	Buzzer	Alert Viewer	Express Report
	✓	Depending on type of RAID Controller	✓	✓

NEC ESMPRO Manager monitors various events of the RAID System as well as failures of Physical Devices, Battery, Flash Backup Unit events and enclosure events described above. NEC ESMPRO Manager logs events detected in the RAID System to the RAID Log. In addition, NEC ESMPRO Manager records important event to the Alert Viewer and sends alerts to the Express Report (MG).

The severities of the events in this category are not reflected to Local Navigation of Web GUI and the property of RAID System.

See " Appendix B : Logs/Events " for detail about the event of enclosure.

Monitoring S.M.A.R.T. error

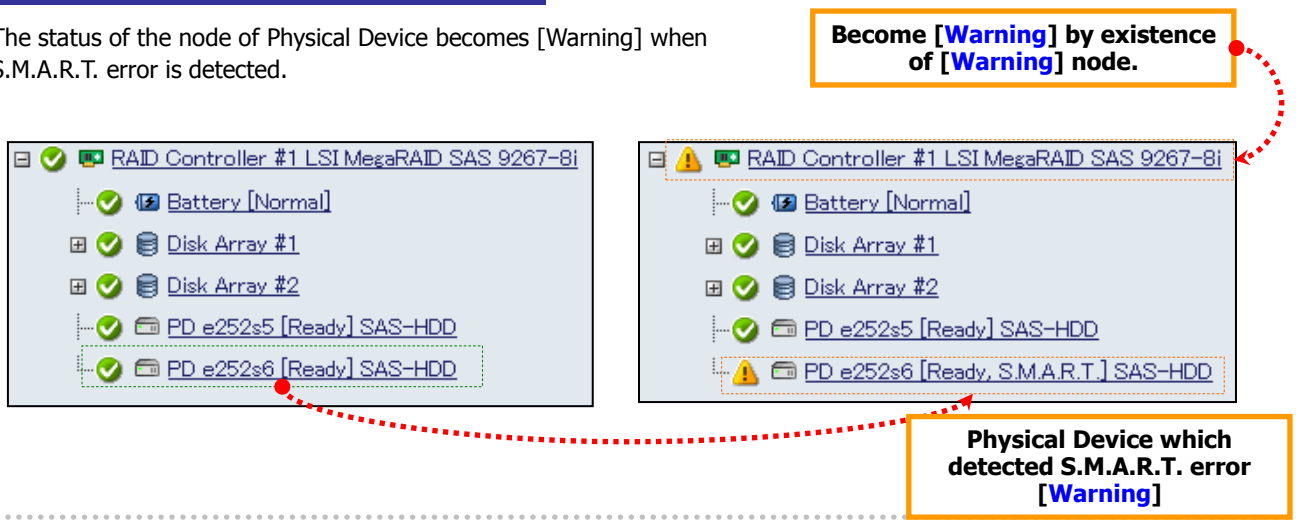
If Physical Devices support S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) and the RAID Controller can detects S.M.A.R.T. errors, NEC ESMPRO Manager can monitor the S.M.A.R.T. errors by the following means.

Web GUI	RAID Log	Buzzer	Alert Viewer	Express Report
✓	✓	Depending on type of RAID Controller	✓	✓

NEC ESMPRO Manager monitors S.M.A.R.T. errors occurred in Physical Devices. Detecting an S.M.A.R.T. error, NEC ESMPRO Manager logs the event to the RAID Log. In addition, NEC ESMPRO Manager reflects the status of S.M.A.R.T. in a Physical Device as the status of the Physical Device (by changing the status of the Physical Device to [Detected]). The status of the Physical Device is retained as its status until the S.M.A.R.T. error is solved.

Local Navigation of Web GUI

The status of the node of Physical Device becomes [Warning] when S.M.A.R.T. error is detected.



Property of Web GUI

The [S.M.A.R.T.] of Physical Device Properties becomes [Detected] when S.M.A.R.T. error is detected.

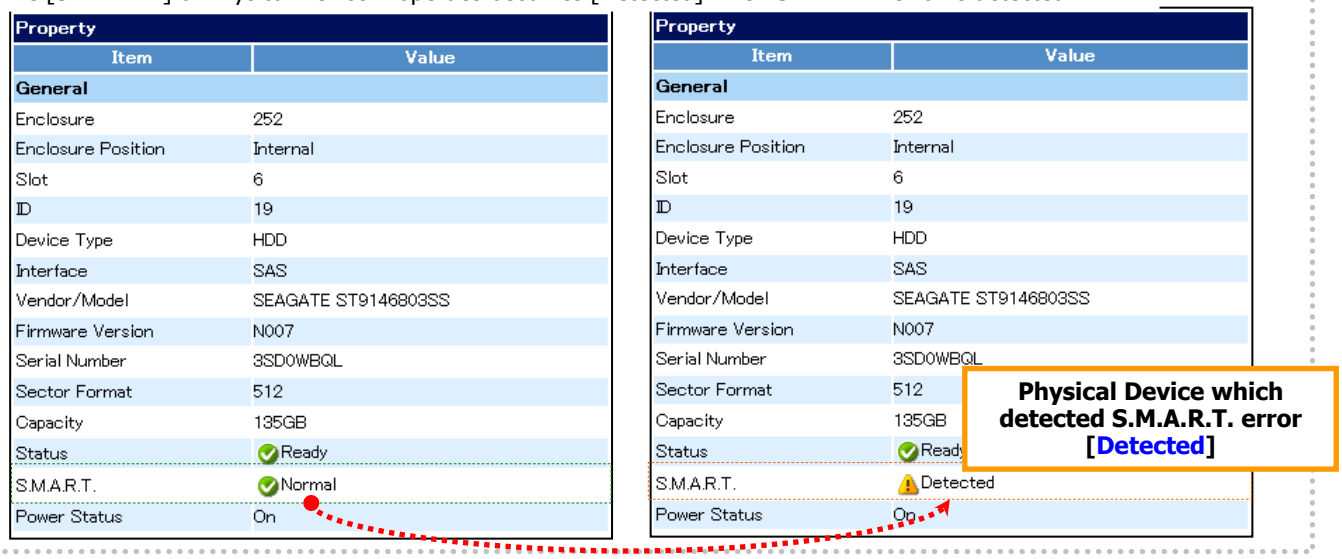


Figure 144 Display of Web GUI (Detection of S.M.A.R.T. error)

Monitoring Endurance Remaining of SSD

If you use RAID Controller which supports monitoring Endurance Remaining of SSD (N8103-176/177/178/179/188) and SSD which supports this function, NEC ESMPRO Manager can monitor Endurance Remaining warning/ error by the following means

Web GUI	RAID Log	Buzzer	Alert Viewer	Express Report
✓	✓		✓	✓

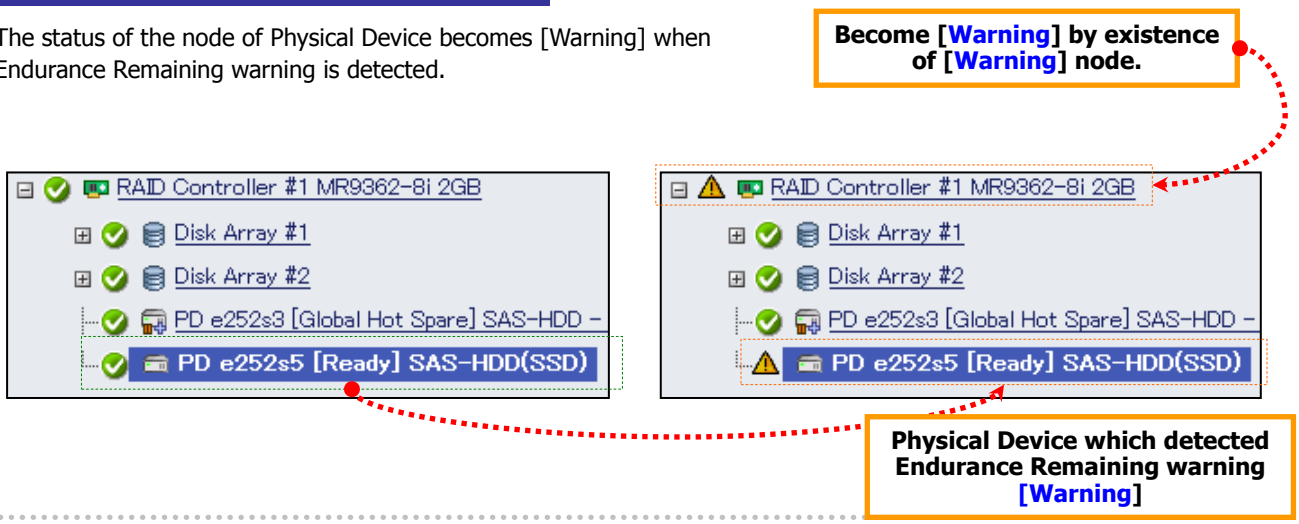
NEC ESMPRO Manager monitors Endurance Remaining warning/ error in Physical Devices. Detecting an Endurance Remaining warning/ error, NEC ESMPRO Manager logs the event to the RAID Log. In addition, NEC ESMPRO Manager reflects the status of Endurance Remaining in a Physical Device as the status of the Physical Device (by changing the icon of the Physical Device to [Warning] or [Fatal]).

	Safe → Unsafe				
[Endurance Remaining] Value	Safe (100-51%)	Reducing (50-21%)	Running out (20-11%)	Need to replace (10% or less)	End of Life
Physical Device status	Normal			Warning	Fatal

If you use SATA SSD, NEC ESMPRO Manager may not monitor Endurance Remaining of the SSD. It depends on the model of the SSD.

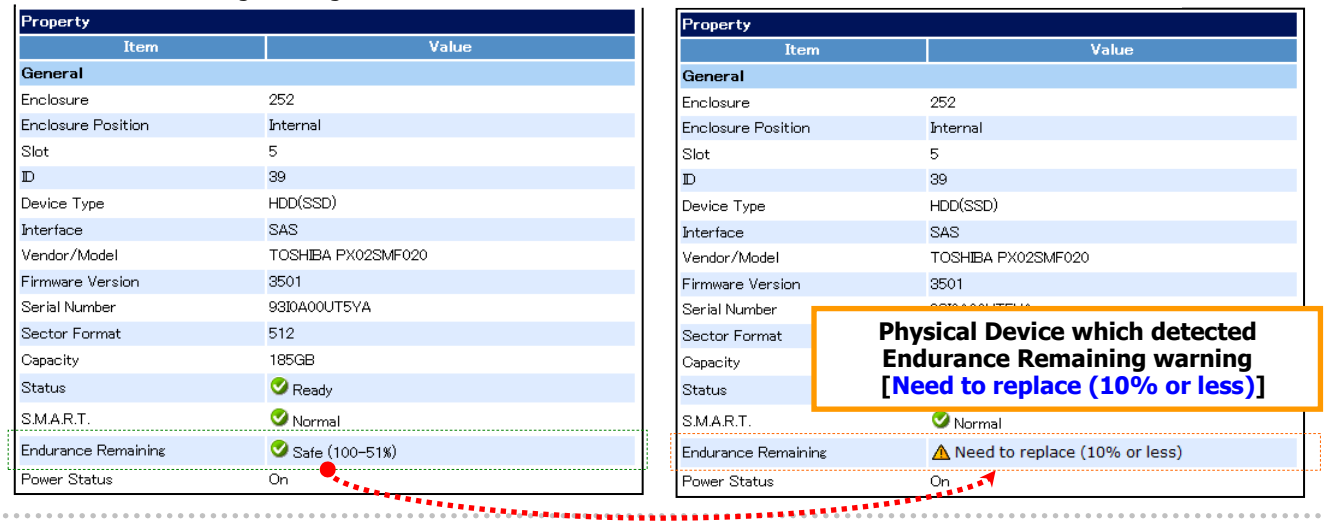
Local Navigation of Web GUI

The status of the node of Physical Device becomes [Warning] when Endurance Remaining warning is detected.



Property of Web GUI

The [Endurance Remaining] of Physical Device Properties becomes [Need to replace (10% or less)] when Endurance Remaining warning detected.



Property

Item	Value
General	
Enclosure	252
Enclosure Position	Internal
Slot	5
ID	39
Device Type	HDD(SSD)
Interface	SAS
Vendor/Model	TOSHIBA PX02SMF020
Firmware Version	3501
Serial Number	93I0A00UT5YA
Sector Format	512
Capacity	185GB
Status	Ready
S.M.A.R.T.	Normal
Endurance Remaining	Safe (100-51%)
Power Status	On

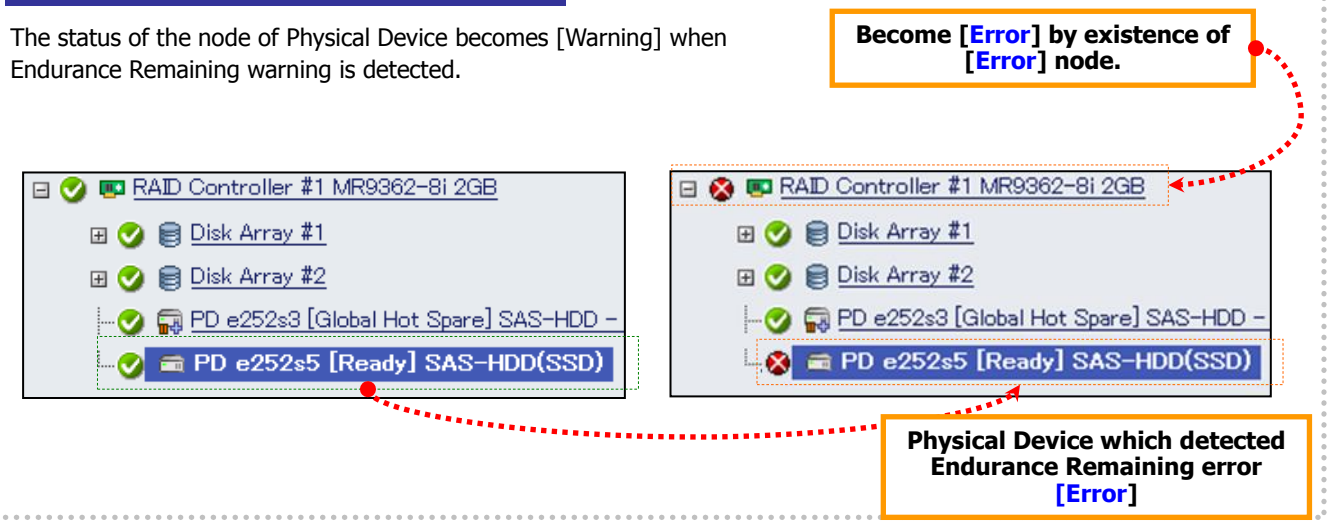
Property

Item	Value
General	
Enclosure	252
Enclosure Position	Internal
Slot	5
ID	39
Device Type	HDD(SSD)
Interface	SAS
Vendor/Model	TOSHIBA PX02SMF020
Firmware Version	3501
Serial Number	
Sector Format	
Capacity	
Status	
S.M.A.R.T.	Normal
Endurance Remaining	Need to replace (10% or less)
Power Status	On

Figure 155 Display of Web GUI (Detection of Endurance Remaining warning)

Local Navigation of Web GUI

The status of the node of Physical Device becomes [Warning] when Endurance Remaining warning is detected.



Property of Web GUI

The [Endurance Remaining] of Physical Device Properties becomes [Need to replace (10% or less)] when Endurance Remaining warning detected.

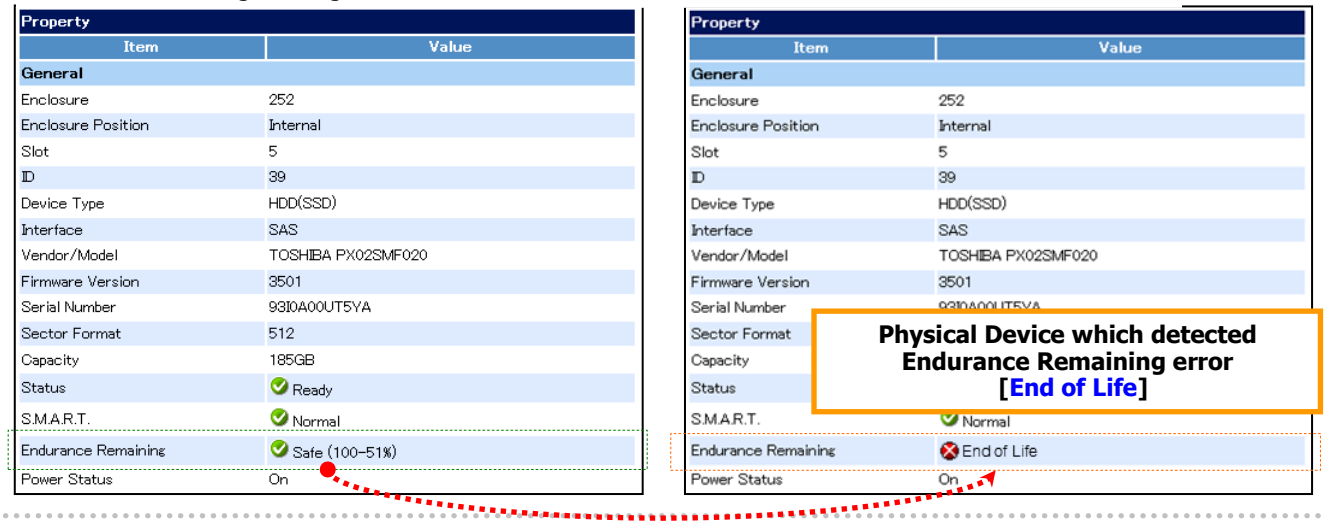


Figure 16 Display of Web GUI (Detection of Endurance Remaining error)

Notes on Use

This chapter describes the notes on use of the NEC ESMPRO Manager RAID System Management function.

NEC ESMPRO Manager

Simultaneous operation from two or more NEC ESMPRO Manager

The following error might occur from NEC ESMPRO Manager to RAID System when runs the operation. When the following error occurs, there is a possibility of running the operation at the same time from other NEC ESMPRO Manager to same RAID System. Please changes timing if whether it operates it like this is confirmed, and it goes and operate it again.

"The system error occurred. Please ask it which component has broken."

Obtaining RAID System information of the server to be managed

It may take a few minutes to obtain the RAID System information for the first time when NEC ESMPRO Manger manages the information of the RAID System with SSD Cache Drive.

Notifying of events of Cache Mode change

The event for Cache Mode change may be notified of twice when you change the Cache Mode of Logical Drive from [Write Through] to [Auto].

Difference depending on the version of the LSI SMI-S Provider and HPE WBEM Provider

The display and operation may differ depending on the LSI SMI-S Provider and HPE WBEM Provider which installed in the server to be managed. For details, see the release memo or attached document of each LSI SMI-S Provider and HPE WBEM Provider.

Stopping service of NEC ESMPRO Manager during running Consistency Check (Automatic Stop disabled)

If restarting the service of NEC ESMPRO Manager during executing "Consistency Check (Automatic Stop Disabled)", behavior of Consistency Check changes to "Consistency Check (Automatic Stop enabled)", and keep running.

If you want to execute Consistency Check through entire Logical Drive even if Medium Error is detected frequently, do not restart the service of NEC ESMPRO Manager while executing Consistency Check (Automatic Stop disabled). See the section "**エラー! 参照元が見つかりません。**" for details.

Time stamp of Medium Error on Physical Device

The time stamp of "Physical Device Medium Error Frequently Detected" and "Physical Device Medium Error Intermittently Detected" events may depart from time stamps of around events.