

ETERNUS SF



ETERNUS SF Storage Cruiser V15.3



Operation Guide

B1FW-5964-05ENZ0(01)
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Preface

Purpose

This manual explains the procedures to operate storage management of ETERNUS SF Storage Cruiser.

Target readers

The manual is intended for operations managers who use ETERNUS SF Storage Cruiser for storage management.

The procedure used for actual system configuration assumes that the reader knows the basic configuration procedure for the installation target server, storage units, and their network.

Organization

This manual is composed as follows:

Chapter 1 Overview

Explains the ETERNUS SF Storage Cruiser.

Chapter 2 Fault Monitoring

Explains how to detect errors occurring in the devices making up a storage system, the screen displayed for them, and how to respond to them.

Chapter 3 Operation Design

Explains LAN connections.

Chapter 4 Environment Configuration

Provides the settings and notes required for devices to be managed.

Chapter 5 Startup and Setting

Provides device definitions and operation flowcharts required for operating this product software.

Chapter 6 Operation

Explains how to use each view of the resource view and Correlation window.

Chapter 7 Performance Management

Explains performance management functions.

Chapter 8 Maintenance of Devices to be Managed

Explains the screen displayed at the occurrence of a device error and how to respond to it.

Chapter 9 Maintenance of the Administrative Environment

Explains how to maintain databases and the troubleshooting required if a problem occurs.

Chapter 10 Linkage to Other Software

Explains how to link with other software.

Chapter 11 Command References

Explains how to use each command.

Appendix A Customization

Explains how to customize definition files.

Appendix B Troubleshooting

Explains basic troubleshooting and also provides information on where to find further help.

[Appendix C How to check product version](#)

Explains how to check version of installed ETERNUS SF Storage Cruiser.

[Appendix D Migrating from the Previous Version](#)

Explains the tool used to upgrade ETERNUS SF Storage Cruiser.

Notation

The names, abbreviations, and symbols shown below are used in this manual.

Operating systems

Formal name	Abbreviation	
Microsoft(R) Windows Server(R) 2003, Standard Edition Microsoft(R) Windows Server(R) 2003, Standard x64 Edition Microsoft(R) Windows Server(R) 2003, Enterprise Edition Microsoft(R) Windows Server(R) 2003, Enterprise x64 Edition Microsoft(R) Windows Server(R) 2003 R2, Standard Edition Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition	Windows Server 2003	Windows
Microsoft(R) Windows Server(R) 2008 Standard (32-bit)(64-bit) Microsoft(R) Windows Server(R) 2008 Standard without Hyper-V(TM) (32-bit) (64-bit) Microsoft(R) Windows Server(R) 2008 Enterprise (32-bit)(64-bit) Microsoft(R) Windows Server(R) 2008 Enterprise without Hyper-V(TM) (32-bit) (64-bit) Microsoft(R) Windows Server(R) 2008 Datacenter (32-bit)(64-bit) Microsoft(R) Windows Server(R) 2008 Datacenter without Hyper-V(TM) (32-bit) (64-bit)	Windows Server 2008	
Microsoft(R) Windows Server(R) 2008 R2 Foundation Microsoft(R) Windows Server(R) 2008 R2 Standard Microsoft(R) Windows Server(R) 2008 R2 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Datacenter	Windows Server 2008 R2	
Microsoft(R) Windows Server(R) 2012 Standard Microsoft(R) Windows Server(R) 2012 Datacenter	Windows Server 2012	
Microsoft(R) Windows(R) XP Professional Edition Microsoft(R) Windows(R) XP Home Edition	Windows XP	
Windows Vista(R) Home Basic Windows Vista(R) Home Premium Windows Vista(R) Business Windows Vista(R) Enterprise Windows Vista(R) Ultimate	Windows Vista	
Windows(R) 7 Home Basic Windows(R) 7 Home Premium Windows(R) 7 Professional Windows(R) 7 Enterprise Windows(R) 7 Ultimate	Windows 7	
Windows(R) 8 Windows(R) 8 Pro	Windows 8	
Solaris(TM) 9 Operating System	Solaris 9	Solaris or Solaris OS
Oracle Solaris 10	Solaris 10	
Oracle Solaris 11	Solaris 11	

Formal name	Abbreviation	
Red Hat(R) Enterprise Linux(R) AS (v.4 for x86) Red Hat(R) Enterprise Linux(R) AS (v.4 for EM64T)	RHEL-AS4	Linux
Red Hat(R) Enterprise Linux(R) ES (v.4 for x86) Red Hat(R) Enterprise Linux(R) ES (v.4 for EM64T)	RHEL-ES4	
Red Hat(R) Enterprise Linux(R) 5 (for x86) Red Hat(R) Enterprise Linux(R) 5 (for Intel64)	RHEL5	
Red Hat(R) Enterprise Linux(R) 6 (for x86) Red Hat(R) Enterprise Linux(R) 6 (for Intel64)	RHEL6	
SUSE(R) Linux Enterprise Server 11 for x86 SUSE(R) Linux Enterprise Server 11 for EM64T	SUSE Linux Enterprise Server 11	
HP-UX 11.0 HP-UX 11i v1 HP-UX 11i v2 HP-UX 11i v3	HP-UX	
AIX 5L(TM) V5.1 AIX 5L(TM) V5.2 AIX 5L(TM) V5.3 AIX(R) V6.1 AIX(R) V7.1	AIX	
VMware(R) Infrastructure 3 Foundation VMware(R) Infrastructure 3 Standard VMware(R) Infrastructure 3 Enterprise	VMware Infrastructure 3	VMware
VMware vSphere(R) 4 Essentials Kit VMware vSphere(R) 4 Essentials Plus Kit VMware vSphere(R) 4 Standard Edition(TM) VMware vSphere(R) 4 Standard Plus Data Recovery VMware vSphere(R) 4 Advanced Edition(TM) VMware vSphere(R) 4 Enterprise Edition(TM) VMware vSphere(R) 4 Enterprise Plus Edition(TM)	VMware vSphere 4	
VMware vSphere(R) 5 Essentials Kit VMware vSphere(R) 5 Essentials Plus Kit VMware vSphere(R) 5 Standard Edition(TM) VMware vSphere(R) 5 Standard Plus Data Recovery VMware vSphere(R) 5 Enterprise Edition(TM) VMware vSphere(R) 5 Enterprise Plus Edition(TM)	VMware vSphere 5	

Oracle Solaris might be described as Solaris, Solaris Operating System, or Solaris OS.

Related products with Fujitsu Storage System ETERNUS and Storage Management Software ETERNUS SF

Formal name	Abbreviation		
ETERNUS DX60/DX60 S2 ETERNUS DX80/DX80 S2 ETERNUS DX90/DX90 S2	-		ETERNUS DX series ETERNUS Disk storage system
ETERNUS DX410 ETERNUS DX440	ETERNUS DX400 series	ETERNUS DX400/DX400 S2 series	
ETERNUS DX410 S2 ETERNUS DX440 S2	ETERNUS DX400 S2 series		
ETERNUS DX8100 ETERNUS DX8400 ETERNUS DX8700	ETERNUS DX8000 series	ETERNUS DX8000/DX8000 S2 series	

Formal name	Abbreviation			
ETERNUS DX8100 S2 ETERNUS DX8700 S2	ETERNUS DX8000 S2 series			
ETERNUS2000 ETERNUS4000 ETERNUS8000	-			
Web GUI of ETERNUS DX series	ETERNUS Web GUI			
ETERNUSmgr				
ETERNUS LT20/LT20 S2 ETERNUS LT40/LT40 S2 ETERNUS LT60/LT60 S2 ETERNUS LT200 ETERNUS LT210 ETERNUS LT220 ETERNUS LT230 ETERNUS LT250 ETERNUS LT270/LT270 S2	ETERNUS Tape library			

Software products

Formal name	Abbreviation
Microsoft(R) Internet Explorer(R)	Internet Explorer
Mozilla(R) Firefox(R)	Firefox
Microsoft(R) Cluster Service	MSCS
Microsoft(R) Windows Server(R) Failover Clustering	WSFC
Microsoft(R) Exchange Server	Exchange Server
Microsoft(R) SQL Server(TM)	SQL Server
PRIMECLUSTER Global Disk Services	GDS
PRIMECLUSTER Global File Services	GFS
Symfoware Server Enterprise Extended Edition Symfoware Server Enterprise Edition	Symfoware
VMware(R) ESX(R)	VMware ESX
VMware(R) ESXi(TM)	VMware ESXi
VMware(R) vCenter(TM) Server	VMware vCenter Server or vCenter Server

Manuals

Formal name	Abbreviation
ETERNUS SF Express / ETERNUS SF Storage Cruiser / ETERNUS SF AdvancedCopy Manager Release Notes	ETERNUS SF Release Notes
ETERNUS SF Express / ETERNUS SF Storage Cruiser / ETERNUS SF AdvancedCopy Manager Installation and Setup Guide	ETERNUS SF Installation and Setup Guide
ETERNUS SF Express / ETERNUS SF Storage Cruiser / ETERNUS SF AdvancedCopy Manager Migration Guide	ETERNUS SF Migration Guide
ETERNUS SF Express / ETERNUS SF Storage Cruiser / ETERNUS SF AdvancedCopy Manager Web Console Guide	ETERNUS SF Web Console Guide
ETERNUS SF Express / ETERNUS SF AdvancedCopy Manager Operation Guide for Copy Control Module	ETERNUS SF Operation Guide for Copy Control Module

Formal name	Abbreviation
ETERNUS SF Storage Cruiser / ETERNUS SF AdvancedCopy Manager Cluster Environment Setup Guide	ETERNUS SF Cluster Environment Setup Guide
ETERNUS SF Express / ETERNUS SF Storage Cruiser / ETERNUS SF AdvancedCopy Manager Messages	ETERNUS SF Messages
ETERNUS SF Express / ETERNUS SF Storage Cruiser Event Guide	ETERNUS SF Event Guide
ETERNUS SF Express / ETERNUS SF Storage Cruiser / ETERNUS SF AdvancedCopy Manager Glossary	ETERNUS SF Glossary

Others

- In this manual, "Fibre Channel switch" includes "Converged Switch".
- In this manual, "ETERNUS4000" does not include ETERNUS4000 models 80 and 100.
- In this manual, "ETERNUS CS800" includes ETERNUS CS800 S2/CS800 S3.
- ETERNUS SF Web Console is abbreviated as "Web Console".

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Notes

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- This manual is subject to change without advance notice.

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Update history

Content of update	Updated section	Revision
Modified the explanation of port numbers.	3.1.1	2.1
Added the operation on Model upgrade for ETERNUS Disk storage system.	8.1.2.7	
Added Oracle Solaris 11, AIX V6.1 and AIX V7.1 in the operating systems.	Notation in Preface	3
Added the explanation for AIX agent.	1.2.6, 2.1, 3.2, 4.1.5, 4.1.6, 5.3, 6.2.3, 6.2.3.2, 6.2.4.2, 8.6, 10.8, A.6, A.7, B.1, B.2, B.3, C.5	
Added Windows Server 2012 and Windows 8 in the operating systems.	Notation in Preface	4
Modified to the description including Windows Server 2012.	Chapter 3, Chapter 11	
Add the explanation about HBA in the table.	6.2.2.1	
Added a chapter about maintenance of devices to be managed.	Chapter 8	
Add the explanation about Systemwalker Centric Manager administrative client.	10.1, 10.1.1, 10.1.4.1	
Changed the command references to the description by the platform common.	Chapter 11	
Added the explanation for the Tape library.	Notation in Preface	
Added the explanation for Brocade VDX series and PRIMERGY BX Ethernet Fabric Switch.	1.2.6, 2.3, 3.1.1, 3.1.2, 4.2.3, 4.2.4, 5.2.2, 9.1.2.8, 10.1.4.2, 11.1.1.2, 11.1.1.4, A.6	4.1
Added the notes for AIX agent.	4.1.5, 5.2.1	

Content of update	Updated section	Revision
Added the note which 1GbE RJ45 port is not displayed.	4.2.3.3	
Added the note of the detailed display of the iSCSI port.	11.1.2.7	
Added the explanation for ETERNUS LT270 S2.	Notation in Preface, 1.2.6, 4.8.2, 8.4, 10.1.4.2, A.6	5
Added the explanation for IPv6.	Chapter 4, Chapter 5, Chapter 9, Chapter 11, Appendix A	
The update procedure of the device configuration information that is maintained by the performance management function is modified.	7.2.9	5.1
Backup/restore procedure of Manager for Windows/Solaris in cluster environment is modified.	9.1.1.2.2, 9.1.1.2.6, 9.1.1.3.2, 9.1.1.3.6	

Manual organization and reading suggestions

Manual organization

The following table describes the Manual organization of Express, Storage Cruiser and AdvancedCopy Manager.

When to read	Related manuals (abbreviated)	Related products (*1)			Explanation
		EXP	SC	ACM	
Before installation	Quick Reference	Yes	Yes	Yes	This manual is unique for each product. The following manuals are available: <ul style="list-style-type: none"> - Express Quick Reference - Storage Cruiser Quick Reference - AdvancedCopy Manager Quick Reference
	Release Notes	Yes	Yes	Yes	This manual is common for all products.
	Overview	-	-	Yes	This manual is unique for each product.
During installation	Installation and Setup Guide	Yes	Yes	Yes	This manual is common for all products.
	Cluster Environment Setup Guide	-	Yes	Yes	This manual is common for Storage Cruiser and AdvancedCopy Manager.
	Migration Guide	Yes	Yes	Yes	This manual is common for all products.
During operation	Operation Guide	Yes	Yes	Yes	This manual is unique for each product. The following manuals are available: <ul style="list-style-type: none"> - Express Operation Guide - Storage Cruiser Operation Guide - Storage Cruiser Operation Guide for Optimization Option - AdvancedCopy Manager Operation Guide (for Windows) - AdvancedCopy Manager Operation Guide (for Solaris) - AdvancedCopy Manager Operation Guide (for Linux)

When to read	Related manuals (abbreviated)	Related products (*1)			Explanation
		EXP	SC	ACM	
					<ul style="list-style-type: none"> - AdvancedCopy Manager Operation Guide (for HP-UX) - AdvancedCopy Manager Operation Guide (for AIX) - AdvancedCopy Manager for Exchange Server Operation Guide
	Operation Guide for Copy Control Module	Yes	-	Yes	This manual is common for Express and AdvancedCopy Manager.
	Web Console Guide	Yes	Yes	Yes	This manual is common for all products.
Anytime	Event Guide	Yes	Yes	-	This manual is common for Express and Storage Cruiser.
	Messages	Yes	Yes	Yes	This manual is common for all products.
	Glossary	Yes	Yes	Yes	This manual is common for all products.

*1: "EXP" indicates Express, "SC" indicates Storage Cruiser and "ACM" indicates AdvancedCopy Manager.

How to read manuals

Use the following table to find the most useful information in the Express, Storage Cruiser and AdvancedCopy Manager manuals to answer your inquiry.

Purpose	Related products (*1)	Manual	Main contents	How to read
Acquiring a product overview and basic operation knowledge	EXP	- Express Quick Reference	<ul style="list-style-type: none"> - Product overview - Installation decision 	Read if you want to acquire a fundamental knowledge of the product and its operation in order to decide to install it or not.
	SC	- Storage Cruiser Quick Reference		
	ACM	- AdvancedCopy Manager Quick Reference	<ul style="list-style-type: none"> - Overview of the necessary tasks from installation to first use - Main functions - Linkable applications - Procedure overview for Advanced Copy of ETERNUS Disk storage system 	
		- AdvancedCopy Manager Overview		
Confirming the updated contents	common	- ETERNUS SF Release Notes	<ul style="list-style-type: none"> - New function overview - Incompatibilities with previous version - Fixed bugs 	Please read if you want to know the updated contents from a previous version and if you perform the upgrade.
Deciding if a version upgrade is required	common	- ETERNUS SF Migration Guide	<ul style="list-style-type: none"> - Notes and cautions about version upgrade - Version upgrade procedure 	Read if you want to upgrade from a previous version.
Installing and operating correctly the product	common	- ETERNUS SF Installation and Setup Guide	<ul style="list-style-type: none"> - Operating environment - Installation procedure - Setup procedure 	Read if you want to install and setup the product.

Purpose	Related products (*1)	Manual	Main contents	How to read
Setting up operating environment depending on purpose			- Uninstallation procedure	Read if you want to install and setup the product on a clustered system.
	SC, ACM	- ETERNUS SF Cluster Environment Setup Guide	- Supported cluster software - Installation procedure for a clustered system - Setup procedure for a clustered system - Uninstallation procedure for a clustered system	
Administration and operation of the installed system	EXP	- Express Operation Guide	- Starting and stopping the software - Device monitoring - Data copy inside the storage system - Necessary tasks after an architectural modification of the system as well as product maintenance	Read if you want to start or shutdown the system, monitor the operation status, do backup/restore operations, etc.
	SC	- Storage Cruiser Operation Guide	- Starting and stopping the software - Device monitoring - Necessary tasks after an architectural modification of the system as well as product maintenance - Command reference	
		- Storage Cruiser Operation Guide for Optimization Option	- Operating environment construction - Operating status monitoring - Necessary tasks after an architectural modification of the system as well as product maintenance - Command reference	
	EXP, ACM	- ETERNUS SF Operation Guide for Copy Control Module	- Starting and stopping the software	
	ACM	- AdvancedCopy Manager Operation Guide (for Windows) - AdvancedCopy Manager Operation Guide (for Solaris) - AdvancedCopy Manager Operation Guide (for Linux) - AdvancedCopy Manager Operation Guide (for HP-UX)	- Data backup/restore inside the storage system - Necessary tasks after an architectural modification of the system as well as product maintenance - Command reference	

Purpose	Related products (*1)	Manual	Main contents	How to read
		- AdvancedCopy Manager Operation Guide (for AIX)		
		- AdvancedCopy Manager for Exchange Server Operation Guide	- Restoring the Exchange Server database using the Restore Wizard	
	common	- ETERNUS SF Web Console Guide	- Operating environment - Screen layout description	Read if you want to understand the ETERNUS SF Web Console.
Dealing with messages issued by the software	common	- ETERNUS SF Messages	- Messages and their explanations - Parameter (variable information) description - System action - Countermeasures	Read if you want a practical way of investigating and dealing with messages issued by the software.
Dealing with events issued by the software	EXP, SC	- ETERNUS SF Event Guide	- Phenomenon of event - Countermeasures	Read if you need to find a practical way of investigating and dealing with events.
Researching the meaning of specific terms related to the products and other important terms	common	- ETERNUS SF Glossary	- Product specific terminology explanation - Explanation of important terminology appearing in the manual - Synonyms and related terms - Proper form of abbreviated terms	Read if you want to learn the meaning of important terms, product specific terms or abbreviations used in the manuals.

*1: "EXP" indicates Express, "SC" indicates Storage Cruiser and "ACM" indicates AdvancedCopy Manager.

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Chapter 1 Overview

1.1 Product Features

This software stands behind the stable operation of a multi-vendor storage system environment such as a SAN, a DAS, and a NAS using the configuration that provide integrated management of storage-related resources and functions of connection, fault, and performance management.

Configuration management realizing total management of devices in an entire system

This function displays the status of each device in a current entire storage system and the status of physical connection between devices graphically on the Web Console. You can drill down from an icon of each device to the detail window to get detail information which part of the device (for example, a Fibre Channel switch port) is connected to which part.

Correlation management realizing total management of small-sized resources of all devices

This function not only manages detailed configurations within the storage devices but also automatically obtains the physical paths from disks and related server node configuration information, and then displays information correlating to this data on a single window.

It used to be very hard to recognize the correlation between entities because those entities were supported by their own management tools and were displayed in various formats respectively. In this software, the correlation of entities can be displayed in a common display format on a single window, and consequently the entire configuration can simply be grasped and an error can be detected if any configuration error should exist.

Fault management function for facilitating to locate of failed parts and affected areas

Failures that occur on devices are properly displayed in an understandable way.

Error information can be automatically reported to Systemwalker, integrated administrative software, and other vendors' Management Software, and centralized management of the system becomes available.

Optimal environment delivery via performance information management

Performance information of managed devices can be managed and displayed. Performance information of devices are stored on the Management Server, past performance information can be accessed as well as real-time performance information. Additionally, because performance information can be viewed in a graphic format, you can simply see the picture of the performance statuses and load statuses of devices.

In addition, threshold values can be set on devices so that alarms are reported when those threshold values are exceeded. The bottleneck causes and locations can be identified, and as a result, the configuration of devices is improved and the operation in the optimal environment is delivered.

Performance information can be viewed from the Report window of Systemwalker Service Quality Coordinator.

1.2 Summary of Each Function

This section explains the function that this software provides for storage systems.

1.2.1 Configuration management

Connection status management

This function displays on the Web Console the status of physical connections between devices. This makes it possible to get a grasp of the access points for the parts of each device (for example, the Fibre Channel switch ports).

Also, since this function displays on the Web Console information correlating with the connections within the storage device and with the servers, it is possible to get a grasp of the entire configuration by looking at one screen.

The Web Console utilizes a web browser for operation and is used for the Storage Cruiser.

Access path management

This function manages and sets access paths automatically by performing integrated management of security functions provided from the server node side, Fibre Channel switch side, and storage side.

An access path can be automatically recognized and displayed from the binding/zoning information that has already been set in a device. Because the access path is collectively managed, based on the security information for each device, even if the physical Fibre Channel cable, a SAN route that forms the access path, is disconnected, the access path can be displayed as an Error.

For access paths managed by this software, the configuration definition of a device can be changed manually as well as automatically from this software. In such cases, it can check whether the manual configuration changes were performed correctly.



.....
Devices subject to storage management must be registered with this software. To register a device, the IP address of the device is required. In addition, a user ID and password for management are required for the Fibre Channel switch.

1.2.2 Fault management

The fault management function of this software has the three features described below.

The fault management function starts monitoring through the registration of the target device to the manager and continues monitoring processing during start up of the manager.



.....
Fault monitoring is performed via LAN. As such, it is not possible to perform fault monitoring for devices which cannot be connected by LAN.

Asynchronous fault event monitoring using event notification from devices

This software processes an SNMP Trap from a device and monitoring information from Agent, properly decodes them, and displays them as an asynchronous event.

Since the displayed contents of the event are more detailed and easier to understand than decodes generated by a normal SNMP MIB compiler, they support smooth operation.

The display format (show, hide) for events can be customized in detail by using an XML file. Therefore, operation can be made suitable for the environment used. In addition, fault management of a device not supported by this software is dynamically enabled by adding and editing the XML file.

Since events can be linked to the Systemwalker Centric Manager linkage and Shell files that can be edited as desired by users, operation can be made suitable for the environment used.



Refer to "[A.6 SNMP Trap XML Definition File](#)" for details of customization.

Fault monitoring using the device polling function (automatic operation by Manager)

The device polling function is a function for this software to observe regularly the state of all devices connected with LAN by using SNMP, ping or unique protocol. When the SNMP Trap from the device cannot be received, the change in the state of the device can be detected and the network error between each device and the Management Server of this software can be detected by this function.

The state change is reflected in the event log and the icon color.

This function is effective to the manual embedded device.

Fault monitoring by checking the current status of devices (manual operation performed by users)

The icon color of a device changes depending on the current status of the device by acquiring latest information.

If a problem occurs, a device status changes the display corresponding to its status.

1.2.3 Performance management

When the performance information reservation command is issued from the Main View, Domain view or SAN view for devices from which performance information is to be obtained, the performance management part of this software uses SNMP to obtain performance information from the devices and saves the obtained information on the Management Server. The information can be displayed and managed in the Web Console.

Performance control functionality supports the Fibre Channel switch and ETERNUS Disk storage systems. This function can be used to obtain the detailed operational status and load status of a device. Additionally, by knowing the number of active disks, it is possible to verify the Eco-mode status of the ETERNUS Disk storage system.

In addition, a threshold can be set for particular information. The function can detect a potential bottleneck and be used to address the problem.

The performance information can be referenced using Systemwalker Service Quality Coordinator. For details, refer to the Systemwalker Service Quality Coordinator manual.



Refer to "[1.2.6 Support levels](#)" for details about supported devices.

Information available for performance management

The information managed by the performance control is different for the fibre channel switch and ETERNUS Disk storage systems. Refer to "[7.1.1 Performance Information Types](#)" for details.

Information available for threshold monitoring

The information managed by the threshold monitoring is different for the fibre channel switch and ETERNUS Disk storage systems. Refer to "[7.1.3 Threshold Monitoring Types](#)" for details.

1.2.4 Energy-saving operation for storage device

The following ETERNUS Disk storage systems have an Eco-mode which controls the ON/OFF status for a disk drive spindle rotation based on Massive Arrays of Idle Disks (MAID) technology.

By stopping the spindle rotation at times when there is no disk drive access, it is possible to cut power consumption and provide an even more eco-friendly environment.

Storage device name	Firmware version
ETERNUS DX series	All versions
ETERNUS2000 models 50, 100 and 200	V10L50 or later
ETERNUS4000 models 300 and 500	V11L50 or later
ETERNUS4000 models 400 and 600	All versions
ETERNUS8000 models 700, 900, 1100 and 2100	V11L50 or later
ETERNUS8000 models 800, 1200 and 2200	All versions

In this software, the following functionality is provided for the above ETERNUS Disk storage systems.

Controlling the Eco-mode

The Eco-mode can be controlled via the Web Console or by executing the `storageadm` command in the Management Server.



See

Refer to "[6.1.6 How to control the Eco-mode](#)" for details.

Displaying the performance information for the number of active disks

Among all disks loaded in the ETERNUS Disk storage system, the disks that "Motor Status" is not "Idle" are displayed as the "number of active disks".

By using the performance information for the number of active disks, the effects of energy-saving operations can be easily verified.



See

Refer to "[7.2.6.5 Displaying the number of active disks, power consumption, and temperature performance information](#)" for details.

Displaying power consumption and temperature performance information (ETERNUS DX60/DX60 S2, DX80/DX80 S2, DX90/DX90 S2, DX400 S2 series, DX8000 S2 series only)

The amount of power used by an ETERNUS Disk storage system device as a whole is displayed as "Power consumption".

The peripheral temperature (fan intake temperature) of an ETERNUS Disk storage system is displayed as "Temperature".

By using the performance information for power consumption, the effects of energy-saving operations can be easily verified.

By using the performance information for temperature, the air-conditioning effects at the device periphery can be easily verified.



See

Refer to "[7.2.6.5 Displaying the number of active disks, power consumption, and temperature performance information](#)" for details.

Concerns in storage system operation when using Eco-mode

There are following concerns when using Eco-mode in storage system operation.

Unit of the Eco-mode control

The Eco-mode can be controlled for each RAID group. Therefore, when different transactions (type, online time, etc.) use a RAID group, the disk drives of its RAID group may not be able to be stopped depending on the operating policy of the transaction. Consider the relation between RAID group and transactions in the design of the storage system operation using Eco-mode.

Uncontrollable RAID groups

The Eco-mode is not available for the following RAID groups.

- A RAID group for which the system disk is included
- A RAID group for which it is set in the NAS area
- A RAID group for which the mainframe volumes, MVV volumes or MVV Concatenation volumes are registered
- A RAID group for which no volumes are registered
- A RAID group that includes an SSD
- A RAID group used by Thin Provisioning function
- A RAID group used by Flexible Tier
- A RAID group belonging to a REC disk buffer
- Temporary RAID group created while executing the Logical Device Expansion

Stopping disk drives

The ETERNUS Disk storage system stops a disk drive after confirming that its disk drive is not accessed within a certain period of time (30 minutes). Therefore, time more than its period is needed until the disk drive stops actually even if the "stop request" in this software is executed.

The ETERNUS Disk storage system does not stop a disk drive while the configuration of the RAID group or volume is changed and the Advanced Copy to access to its disk drive is done. Therefore, the disk drives may not be stopped even if the "stop request" in this software is executed. The disk drives will stop when the procedure is completed in the ETERNUS Disk storage system.

Starting disk drives

When it is accessed to the stopped disk drive, the ETERNUS Disk storage system starts its disk drive rotation. However, a few minutes (about three minutes) is needed until the disk drive becomes the accessible status.

Continuous disk drive rotation

When the number of the starting disk drive rotation exceeds the number of certain times (three times), the ETERNUS Disk storage system judges that its disk drive is used with high frequency and does not stop its disk drive rotation. Therefore, even if the "stop request" in this software is executed, after the disk drive status changes from "Idle" to "Active" and there is no access to its disk drive, its disk drive status may not change to "Idle".

The number of the starting disk drive rotation per one day is cleared to zero when time of ETERNUS Disk storage system becomes 00:00.

1.2.5 Storage capacity virtualization operation

The ETERNUS Disk storage systems below are equipped with a storage capacity virtualization function that uses Thin Provisioning technology.

Storage device name	Firmware version
ETERNUS DX80 S2/DX90 S2 ETERNUS DX400/DX400 S2 series ETERNUS DX8000/DX8000 S2 series	All versions
ETERNUS4000 models 400 and 600 ETERNUS8000 models 800, 1200 and 2200	V20L30 or later

Thin provisioning technology virtualizes and allocates storage resources, thus enabling the physical capacity of the storage to be reduced. Environments where thin provisioning have been installed manage physical disks as a common disk pool, and allocations to servers are treated as allocations to a virtual volume. When writing to a virtual volume, physical disks are allocated from the disk pool in accordance

with the size of the data being written. Physical disks can be extended in accordance with the disk pool busy rate without affecting the servers. This enables users to start operation using only a small physical disk capacity to make large capacity virtual disk allocations to servers, thus keeping the initial investment low (small start).

In this software, the following functionality is provided for the above ETERNUS Disk storage systems with Thin Provisioning.

Configuration management

This function makes the associations between virtual volumes and physical disks visible. The Web Console displays the associations between the configuration that is virtualized by means of thin provisioning (disk pool and virtual volumes) and the physical configuration (RAID groups and physical disks). This function makes it easy to check the affected location when a physical disk fault or other problem occurs.

Threshold monitoring

This function monitors the disk pool threshold values and performs capacity management. Threshold values are established for the physical disk pool and these values are monitored so that consumption of the physical capacity does not cause disk pool shortages. When the disk busy rate reaches the threshold value, an alarm notifies the user, thus preventing operation stoppages.



See

Refer to "6.4 Thin Provisioning management" for details.

Notes on storage capacity virtualization operation

There are following concerns when managing storage capacity virtualization operations.

Operations that are not possible

This product cannot perform the following operations related to thin provisioning and Flexible Tier:

- Performance monitoring of disk pools

1.2.6 Support levels

The scope of the storage management functions of this software that can be used varies with the storage device model being used. For this software, the scope of available functions is represented as support levels, which are used as settings of the fault monitoring function and for other purposes. The table below lists the support levels that can be selected.

Support level	Typical device name	Device detection	Fault management			Management window linkage	Performance management
			SNMP Trap monitoring	Device polling monitoring (*1)	Acquisition of device state		
A	ETERNUS DX series ETERNUS2000 ETERNUS4000 ETERNUS8000 ETERNUS SN200 (except model 250M) ETERNUS SN200MDS (*5) PRIMERGY BX600 Fibre Channel switch blade Brocade series Brocade VDX series (*5) (*8) PRIMERGY BX	Automatic (*2)	Y1	Y1	Y1	Y1	Y1 (*6)

Support level	Typical device name	Device detection	Fault management			Management window linkage	Performance management
			SNMP Trap monitoring	Device polling monitoring (*1)	Acquisition of device state		
	Ethernet Fabric Switch (*5)(*8)						
B	Solaris OS, Windows, Linux, HP-UX, VMware, AIX server node on which ETERNUS SF Storage Cruiser's agent is already installed ETERNUS LT270,LT250 (*5) McDATA Intrepid 6140 McDATA Sphereon 4500	Automatic (*2)	Y1	Y1	Y1	Y1	-
C	VMware Infrastructure 3 Version 3.5 or later VMware ESXi 3.5 or later VMware vSphere 4 or later	Automatic (*2)	-	Y1	Y1	-	-
D	NetApp FAS Series NetApp V-Series	Manual	Y1 (*5)	Y1	-	Manual setting	Y1 (*7 For data collection only)
E	ETERNUS LT20/LT20 S2 ETERNUS LT40/LT40 S2 ETERNUS LT60/LT60 S2 ETERNUS LT200 ETERNUS LT210 ETERNUS LT220 ETERNUS LT230 ETERNUS LT270 S2 ETERNUS CS800 ETERNUS CS2000 ETERNUS VS850	Manual	Y1 (*5)	Y1	-	Manual setting	-
H	ETERNUS SN200 model 250M	Manual	Y1 (*5)	Y1	-	Manual setting	-
I	Other devices that are manually embedded	Manual	- (*3)	- (*4)	-	Manual setting	-

Y1: Detail information on device internal elements can be displayed.

Y2: Information on the device and FC port can be displayed.

*1: The protocols using in the device polling are as follows.

Typical device name	Protocol Name
ETERNUS DX series ETERNUS2000, ETERNUS4000, ETERNUS8000 ETERNUS SN200 (except model 250M) PRIMERGY BX600 Fibre Channel switch blade Brocade series Brocade VDX series PRIMERGY BX Ethernet Fabric Switch	SNMP
Server node on which ETERNUS SF Storage Cruiser's agent is already installed	unique protocol
VMware Infrastructure 3 Version 3.5 or later VMware ESXi 3.5 or later VMware vSphere 4 or later	VMware dedicated protocol
Other than listed above	ping

*2: The "Detect device in subnet" function is not supported by the devices below. Specify and register the IP addresses.

- The following devices that firmware version is V20L20 or later:
ETERNUS DX400 series, ETERNUS DX8000 series, ETERNUS4000 models 400 and 600, ETERNUS8000 models 800, 1200 and 2200
- Solaris OS, Windows, Linux, HP-UX, VMware, AIX server node on which ETERNUS SF Storage Cruiser's agent is already installed
- VMware server node
- Solaris OS, Windows, Linux, HP-UX server node on which Softek Storage Cruiser's agent is already installed
- ETERNUS LT250,LT270
- The following switches may not be able to be detected in subnet depending on the firmware version, etc.
ETERNUS SN200 series, Brocade series, PRIMERGY BX600 Fibre Channel switch blade, Brocade VDX series, PRIMERGY BX Ethernet Fabric Switch

*3: For devices supporting SNMP Traps, this function is enabled by creating a SNMP Trap XML definition file.

*4: For devices supporting LAN, ping monitoring is enabled by specifying an IP address at manual embedding.

*5: SNMP Trap transmission must be set for each device. (This software does not automatically make said setting.)

*6: There are concerns in performance information. Refer to the Note in "[7.1.1 Performance Information Types](#)".

*7: For NetApp FAS Series. To refer to the performance information that is collected on the NetApp FAS Series, must be linkage with Systemwalker Service Quality Coordinator. Contact a Fujitsu system engineer for details on performance information.

*8: Only as for devices whose firmware version number is 3.0.1 or later, the performance management function is supported.

1.3 Storage Cruiser Configuration

Storage Cruiser consists of the following programs: Manager function and Agent function.

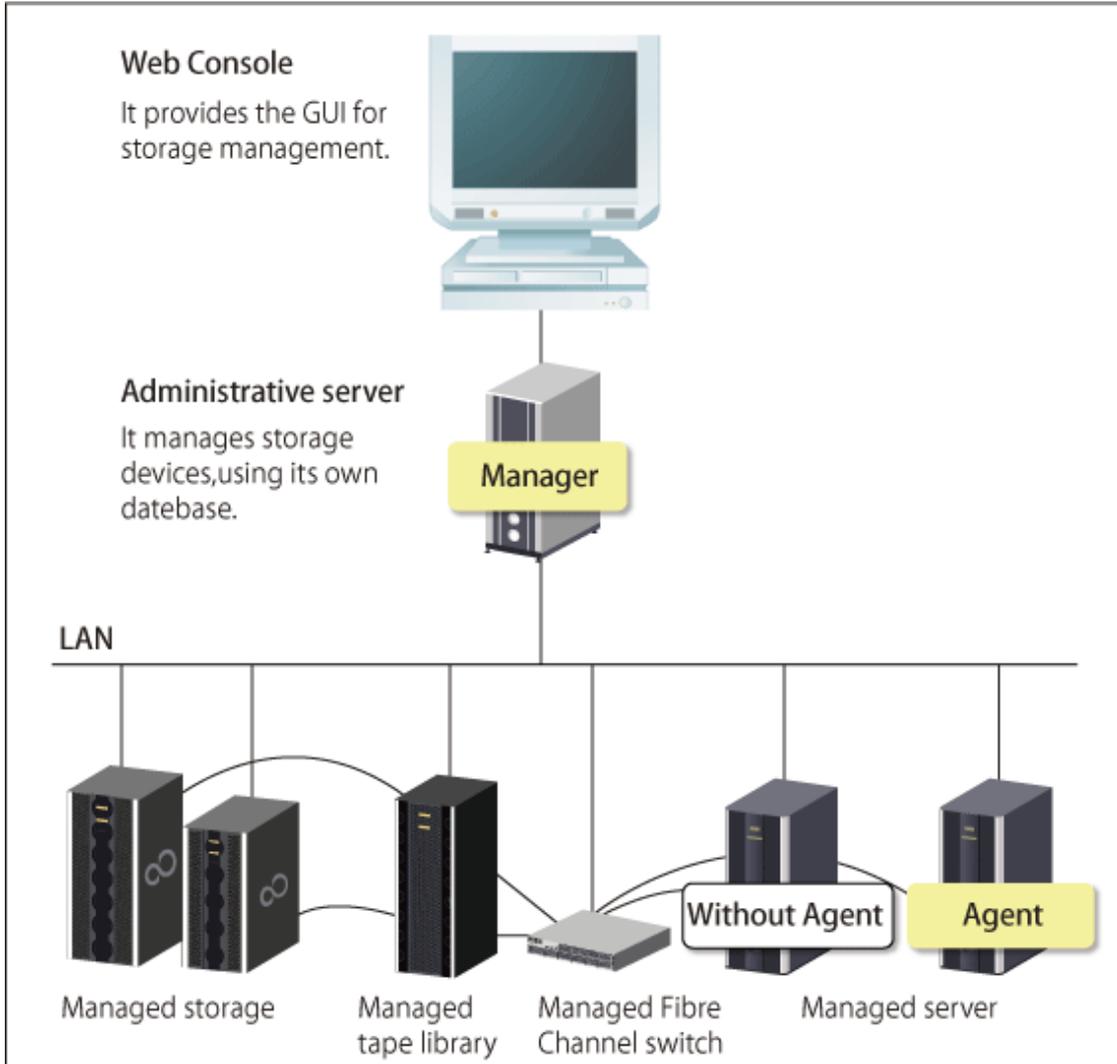
This guide refers to devices on which respective programs were installed as the Management Server and the server node. These programs can be installed on a single device and operated as well. In that manner, there is no restriction on the order of installation of these programs.

Manager function (Management Server) is the central management part of Storage Cruiser that obtains and sets information about devices involved in the storage system on the LAN. Important data among those used for controls are stored in the database.

Agent function (server node) controls information about home software such as an HBA and a multipath driver on the server node using the storage and communicates with Manager function. When there are several server nodes, it must be installed on each of them.

The Manager function is accessed using the Web Console. It is possible to connect to one ESC Manager from the multiple Web Consoles.

Figure 1.1 Storage Cruiser Configuration



Chapter 2 Fault Monitoring

This chapter describes how this software monitors for faults in devices consisting of a storage system and explains the fault information displayed and actions to be taken if an error occurs.



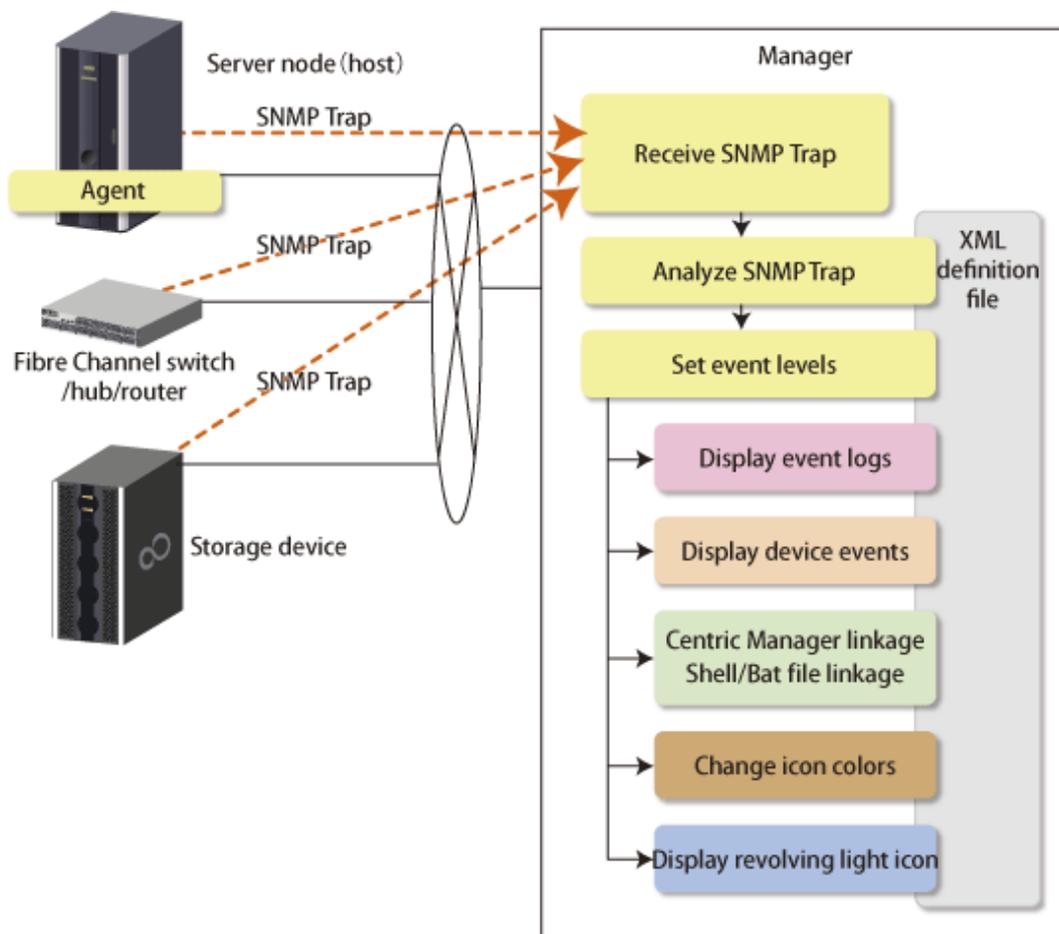
Refer to "1.2.2 Fault management" for details on fault monitoring.

Refer to the *ETERNUS SF Event Guide* for details on events.

Refer to "1.2.6 Support levels" for details on the support levels mentioned in this chapter.

This software performs the fault monitoring operation as explained below by processing events that are asynchronously reported by monitoring information from Agent and an SNMP Trap from each device. The SNMP Trap must be correctly set in the device that supports that SNMP Trap.

The Manager's event processing function is a resident function that is always when Manager is started (when the Management Server is started up). Therefore, a Web Console does not need to be started when a fault is only reported by Systemwalker Centric Manager linkage or Shell/bat linkage.



Manager processes event monitoring information from Agent in the same manner as for an SNMP Trap.

2.1 Receiving SNMP Traps

First, set up an environment in which devices can send SNMP Traps.

Server node

SNMP Trap transmission place addresses are automatically set for the server node agent when this software registers devices.

If Manager operates across multiple networks, however, this software may not be able to set correct settings for the server node agent. In this event, check whether SNMP Trap transmission place addresses are correctly set for the server node agent. The files indicated below for the server nodes specify the SNMP Trap transmission place addresses of the server node agent. Check the addresses, and edit any address that must be corrected. To operate according to the contents of the file the restart of Agent is needed.

Server node OS	Place of file
Windows	\$TMP_DIR\ESC\Agent\var\sanm.ip (\$TMP_DIR means "Work Directory" specified at the Agent installation.)
Solaris OS, Linux, HP-UX, AIX	/var/opt/FJSVssage/sanm.ip

Note

For the following environment, the fault monitoring function by receiving SNMP Traps is not supported.

- VMware Infrastructure 3 Version 3.5 or later
- VMware vSphere 4 or later
- VMware ESXi 3.5 or later

Support levels A, B

When this software registers devices, SNMP Trap transmission place addresses are automatically set for devices to be managed.

However, if Manager operates across multiple networks, this software may not be able to set the correct setting for each device to be managed. In this case, check whether SNMP Trap transmission target addresses are correctly set for the managed devices.

In addition, if SNMP Trap transmission place addresses are automatically set, the SNMP Trap transmission send destination community name is fixed to "public".

Support levels E, I (for devices supporting SNMP Traps)

The SNMP Trap transmission place address is set on a device to the Management Server. For details of this setting, refer to the operation manual of the device.

Support level I (for devices not supporting SNMP Traps)

Fault monitoring by the mechanism is disabled since said devices do not support the SNMP Trap function.

Other server nodes (including Solaris OS and Windows server nodes without an agent) do not support fault management.

Note

Check whether the SNMP Trap monitoring service is running. If not, start it. For details about checking and starting the service, refer to the following sections:

- For Windows environment
["11.3.1.1 Starting and stopping the SNMP Trap monitoring service"](#)
- For Solaris environment
["11.3.2.1 Starting and stopping the SNMP Trap monitoring daemon"](#)
- For Linux environment
["11.3.3.1 Starting and stopping the SNMP Trap monitoring daemon"](#)

2.2 Analyzing SNMP Traps

The Management Server processes SNMP Traps according to the support levels of the mechanism for devices, as described below.

- Server node agent

SNMP Traps are decoded.

- Support levels A, B and E

SNMP Traps are decoded. Incidentally, the only SNMP Traps decoded are those for which event display and linkage are required.

- Support level I (for devices supporting SNMP Traps)

Device-specific SNMP Traps are not decoded.

Note that SNMP Traps not supported by this software can be decoded, however, by creating a SNMP Trap XML definition file. For details, see "[A.6 SNMP Trap XML Definition File](#)".

Information

Methods of decoding SNMP Traps can be customized. Refer to "[A.6 SNMP Trap XML Definition File](#)" for details.

Note

If an Error or Warning level event is reported, update the corresponding storage system element status manually.

When the status of the storage system is recovered, also update the corresponding storage system element status manually.

The global status of the system containing the element is updated automatically.

Refer to "Reload ETERNUS Disk storage system configuration information" in the *ETERNUS SF Web Console Guide* for details on the operation procedures.

2.3 Device Polling

The Manager checks the statuses of registered devices by using SNMP, ping or unique protocol at intervals of 60 seconds (default). It is as follows which polling method.

Polling method	Protocol	Devices
Device status	SNMP	ETERNUS Disk storage system NetApp FAS Series and V-Series
Communication status	SNMP	ETERNUS SN200 series Fibre Channel switch PRIMERGY Fibre Channel switch blade Brocade Fibre Channel switch Brocade VDX series PRIMERGY BX Ethernet Fabric Switch
	unique protocol	server nodes for which Agent is installed
	private protocol	VMware Infrastructure 3 Version 3.5 or later VMware vSphere 4 or later VMware ESXi 3.5 or later
	ping	Devices supporting automatic detection, other than the above devices. Manually embedded devices for which IP addresses are set.

- Device status polling method

For devices using SNMP, the system obtains status information using the respective vendor's private MIB. If the status has been changed compared with that stored by Manager, an event is displayed depends on the change.

- Communication status polling method

Changes in device status cannot be detected. However, if an abnormality occurs in the device or in a network between the device and the Manager and there is no response to a communication (non-communicating state), then an event is displayed and the icon color changes to gray. The next time there is a response to polling, the previous state (the one before the non-communicating state) is restored.

For VMware Infrastructure 3 Version 3.5 or later, VMware vSphere 4 or later and VMware ESXi 3.5 or later, this software uses a private protocol of VMware. The communication status polling method does not detect changes in the device status, but does detect the non-communicating status. The polling is performed only for VM hosts; VM guests are not polled. When the non-communicating state is detected for a VM host, this software judges that the VM host and all the VM guests included in it are in the non-communicating state.

With either SNMP or ping, Systemwalker Centric Manager linkage and Shell/bat linkage are enabled by default. The swsag code reported to Centric Manager is 4822. The linkage behavior can be modified. For information see "[A.8 Device Polling Setting File](#)".

Users can customize polling intervals, the time at which operation stops, the specification of devices to be excluded from polling operation, and other device polling functions. For details, see "[A.8 Device Polling Setting File](#)".



When the device polling detects a change in network or device status, any event of "Device Polling Event" in the *ETERNUS SF Event Guide* is displayed. However, when the state change of device is detected by executing [Reload Conf.] operation, the following events are not displayed. Confirm the state from a Web Console.

2.4 Setting Event Levels

If Manager receives an SNMP Trap from a device, the device's status display on the Web Console is displayed as described below depending on the support level of the mechanism for the device.

There are three event levels: Error, Warning, and Information.

- Server node agent

The device status may or may not be changed.

For HBA faults and faults detected in the multipath driver, the device status will be changed to a status that is the same as the event level.

For faults detected in middleware besides the multipath driver, the device status is not reflected in the event-only display.

- Support levels A, B and E

The device status is changed to a status which is the same as the event level.

If you have performed "Reload Conf." after this, the device status for support levels A and B will be changed to the statuses read from the device.

- Support level I (for devices supporting SNMP Traps)

Status is not changed.



The event level for individual SNMP Traps can be customized. Refer to "[A.6 SNMP Trap XML Definition File](#)" for details.

Chapter 3 Operation Design

3.1 LAN Connections

Manager manages devices, using the LAN I/Fs of a device subject to management.

Connect the LAN for management to all devices subject to management.

In this case, transactions affected by management can be minimized by separating the LAN for management from that for transaction.

3.1.1 Network requirements

When a firewall is placed between Manager and a device subject to management, set the following port numbers to be able to pass the firewall.

Communication with the manager

Transmission destination device	Port/protocol	Transmission start direction	Function
Server node (Agent)	4917/tcp	Manager -> device	Configuration management, Polling monitoring
	162/udp	Device -> Manager	Fault management
Windows Server 2008 R2 (Hyper-V function installation environment) Windows Server 2012 (Hyper-V function installation environment)	5985/tcp	Manager -> device	Configuration management
VMware Infrastructure 3 Version 3.5 or later VMware vSphere 4 or later VMware ESXi 3.5 or later VMware vCenter Server 4 or later	443/tcp	Manager -> device	Configuration management, Polling monitoring
Fibre Channel switch ETERNUS SN200 series Brocade Fibre Channel switch PRIMERGY Fibre Channel switch blade	161/udp	Manager -> device	Configuration management, Performance management, Polling monitoring
	23/tcp	Manager -> device	Configuration management
	162/udp	Device -> Manager	Fault management
Brocade VDX series PRIMERGY BX Ethernet Fabric Switch	161/udp	Manager -> device	Configuration management, Performance management, Polling monitoring
	830/tcp	Manager -> device	Configuration management
	162/udp	Device -> Manager	Fault management
Disk Storage System ETERNUS DX80 S2/DX90 S2 ETERNUS DX400 S2 series ETDRNUS DX8000 S2 series	161/udp	Manager -> device	Configuration management, Performance management, Polling monitoring
	22/tcp	Manager -> device	Configuration management, Performance management
	23/tcp	Manager -> device	Configuration management

Transmission destination device	Port/protocol	Transmission start direction	Function
	1999/tcp (*1)	Manager -> device	Configuration management
	1372/tcp (*2)	Manager -> device	Configuration management, Performance management
	162/udp	Device -> Manager	Fault management
Disk Storage System ETERNUS DX60/DX60 S2/DX80/DX90 ETERNUS DX400 series ETERNUS DX8000 series ETERNUS2000 ETERNUS4000 ETERNUS8000	161/udp	Manager -> device	Configuration management, Performance management, Polling monitoring
	1999/tcp (*1)	Manager -> device	Configuration management
	23/tcp	Manager -> device	Configuration management (For ETERNUS DX60/DX60 S2/DX80/DX90)
	162/udp	Device -> Manager	Fault management
Disk Storage System other than listed above	161/udp	Manager -> device	Configuration management, Polling monitoring
	80/tcp	Manager -> device	Configuration management
	1999/tcp (*1)	Manager -> device	Configuration management
	162/udp	Device -> Manager	Fault management
Tape library ETERNUS LY250/LT270	161/udp	Manager -> device	Configuration management
	162/udp	Device -> Manager	Fault management
	ping/icmp	Manager -> device	Polling monitoring
Network disk array NetApp FAS Series and V-Series	162/udp	Device -> Manager	Fault management
	161/udp	Manager -> device	Polling monitoring
Manual embedding, and others	162/udp	Device -> Manager	Fault management
	ping/icmp	Manager -> device	Polling monitoring

*1: For Maintenance connection

*2: For Maintenance-Secure connection

3.1.2 SNMP Community

The names of the SNMP Communities which Manager uses for the managed devices and their SNMP transmissions is specified during device registration or set with the setting file (sanma.conf). The defaults for the managed devices' SNMP Community names are as follows.

Transmission destination device	Default	Access	Method of settings
Fibre Channel switch ETERNUS SN200 series Brocade Fibre Channel switch PRIMERGY Fibre Channel switch blade	public	read	Refer to "4.2.1.1 Setting" for detailed settings.
	private	read/write	
Brocade VDX series PRIMERGY BX Ethernet Fabric Switch	public	read	Refer to "4.2.3.1 Setting" for detailed settings.
SN200 MDS(Cisco MDS) Fibre Channel switch	public	read	Refer to "4.2.5.1 Settings" for detailed settings.

Transmission destination device	Default	Access	Method of settings
McDATA Fibre Channel switch	public	read	Refer to "4.2.6.1 Settings" for detailed settings.
Disk Storage System ETERNUS DX series ETERNUS2000 ETERNUS4000 ETERNUS8000	public	read	Refer to "4.3.1.1 Setting" for detailed settings.

Information

Refer to "SNMP_COMMUNITY_NAME_FOR_IP" in "A.2 sanma.conf Parameter" for changing the community name to use. However, it is also possible to change the SNMP Community name from the Web Console if the device for which you are changing the SNMP Community name is an ETERNUS Disk storage system.

3.2 Server node middleware for which management is possible

The server node middleware for which management is possible are as follows. Inquire for the latest support information.

OS Platform	Type of Middleware	Product Name	Version No.	Fault Monitoring
Solaris 9	Multipath driver	ETERNUS Multipath driver	2.0.1 or later	A
	Mirror disk driver	PRIMECLUSTER Global Disk Services	All versions	A
	File system	UFS	-	N/A
Solaris 10 (*2, *3)	Multipath driver	ETERNUS Multipath driver	2.0.1 or later	A
		MPxIO	-	A
	Mirror disk driver	PRIMECLUSTER Global Disk Services	4.1A40 or later	A
	File system	UFS	-	N/A
		ZFS	-	N/A
		QFS	-	N/A
Solaris 11 (*2, *4)	Multipath driver	MPxIO	-	A
	Mirror disk driver	PRIMECLUSTER Global Disk Services	4.3A10 or later	A
	File system	UFS	-	N/A
		ZFS	-	N/A
Windows Server 2003 (x86)	Multipath driver	ETERNUS Multipath driver	V2.0L10 or later	A
	File system	NTFS	-	N/A
Windows Server 2003 (x64)	Multipath driver	ETERNUS Multipath driver	V2.0L11 or later	A
	File system	NTFS	-	N/A
Windows Server 2008	Multipath driver	ETERNUS Multipath driver	V2.0L14 or later	A
		msdsm (*5)	6.0 or later	A
	File system	NTFS	-	N/A
Windows Server 2012	Multipath driver	ETERNUS Multipath driver	V2.0L19 or later	A
		msdsm (*5)	6.2 or later	A
	File system	NTFS, ReFS	-	N/A

OS Platform	Type of Middleware	Product Name	Version No.	Fault Monitoring
RHEL-AS4 RHEL-ES4	Multipath driver	ETERNUS Multipath driver	V2.0L02 or later (*1)	A
	File system	ext2, ext3	-	N/A
RHEL5 RHEL6	Multipath driver	ETERNUS Multipath driver	V2.0L11 or later	A
		Device-Mapper Multipath	-	A
	File system	ext2, ext3	-	N/A
SUSE Linux Enterprise Server 11	Multipath driver	ETERNUS Multipath driver	V2.0L11 or later	A
		Device-Mapper Multipath	-	A
	File system	ext2, ext3, reiserfs	-	N/A
HP-UX 11.0 HP-UX 11i v1 HP-UX 11i v2	Multipath driver	PV-LINK (LVM function) (*6)	-	A
	Mirror disk	LVM	-	N/A
HP-UX 11i v3	Multipath driver	PV-LINK (LVM function) (*6)	-	A
		Native multipath function (*6)	-	A
	Mirror disk	LVM	-	N/A
AIX	Multipath driver	MPIO	-	A
	File system	JFS, JFS2	-	N/A

*1: For V2.0L02, it is necessary to implement the patch (ETERNUS Multipath driver V2.0L02 patch01).

*2: If using a zone with Solaris 10 or Solaris 11, the non-global zone is not supported for fault monitoring.

*3: If using a SUN-made HBA, only the file system (UFS, ZFS, and QFS) and the multipath driver (MPxIO) are supported.

*4: If using a SUN-made HBA, only the file system (UFS and ZFS) and the multipath driver (MPxIO) are supported.

*5: This is a multipath driver embedded as a standard in the Windows Server 2008 and later Windows operating systems.

*6: The [Mount Point] in the [End to End View] displays a hyphen ("-").

Chapter 4 Environment Configuration

This chapter provides settings and notes required for devices to be managed.

Flow of All Operations

Whether building a new storage system or using this software for an existing storage system, start the environment setup and operation according to the procedure indicated in the figure shown below. Software can be installed and set up on individual devices in any sequence.

Note that once this software is installed and devices to be managed are registered, regardless of the connection status from the Web Console, while the Management Server is starting up, the processing for when there is a fault/fault monitoring will be performed to the registered device. Also, for the device for which performance management is being performed, performance information will continue to be stored.

4.1 Server Node (Host)

4.1.1 Solaris OS server node (host)

Two methods are used for managing Solaris OS server nodes: one method installs Agent on the host, and the other does not.

There is a difference in functionality depending on whether the agent was installed or whether it was not installed (with registration performed by manual embedding).



See

Refer to "3.2 Server node middleware for which management is possible" for information about products that can be monitored by Agent.



Note

The limitations when Solaris OS server nodes are managed using the Agent:

- If device files of more than one controller number are generated
If more than one device driver type is used to access storage of a different type from a single HBA, device files for at least 2 controller numbers may be generated for the single HBA. This software does not support this status.
If there is a problem with information gathering or display, manage the server nodes using the manual embedding function. Refer to "5.2.6 Registering a Manually Embedded Device" for details on the manual embedding function.

4.1.1.1 SNIA HBA API library settings

To manage the HBAs that are installed at Solaris OS server nodes, the SNIA HBA API library that an HBA vendor distributes must be installed.

Refer to the *SNIA HBA API Library Installation Guide* at the following URL for details on how to install the HBA API library:

<http://www.fujitsu.com/global/services/computing/storage/eternus/products/eternus-sf/cruiser/download/>

4.1.1.2 N-port settings

N port setting is needed on the side of HBA when connecting with the Fibre Channel switch. The method of setting the port of HBA as N port depends on the HBA type. Each method for setting is shown below.

For Solaris OS default emlxs driver (target HBA : XSEFC401AF, XSEFC402AF, SG-XPCIE2FC-EM4, SG-XPCIE2FC-EM8, and so on.)

Specify "2" for the emlxsX-topology parameter in the /kernel/drv/emlxs.conf file.

```
#
# +++ Fibre Channel specific parameters +++
#
# topology: link topology for initializing the Fibre Channel connection.
#
#         0 = attempt loop mode, if it fails attempt point-to-point mode
#         2 = attempt point-to-point mode only
#         4 = attempt loop mode only
#         6 = attempt point-to-point mode, if it fails attempt loop mode
#
# Set point-to-point mode if you want to run as an N_Port.
# Set loop mode if you want to run as an NL_Port.
#
# Range: Min:0 Max:6 Default:0
#
emlxs0-topology=2;
emlxs1-topology=2;
```

For Solaris OS default qlc driver (target HBA : SE0X7F21F, SE0X7F22F, SG-XPCI1FC-QF2, SG-XPCI2FC-QF2, SG-XPCI1FC-QL2, SG-XPCI2FC-QF2-Z, SG-XPCI1FC-QF4, SG-XPCIE2FC-QF8, and so on.)

N port settings are not required.

4.1.2 Windows server node (host)

This software provides two methods for managing Windows hosts: one method installs Agent on the host, and the other does not.

There is a difference in functionality depending on whether the agent was installed or whether it was not installed (with registration performed by manual embedding).



See

Refer to "3.2 Server node middleware for which management is possible" for information about the products that can be observed by Agent.

4.1.2.1 SNIA HBA API library settings

To manage the HBAs that are installed in Windows server nodes, the SNIA HBA API library that an HBA vendor distributes must be installed.

Refer to the *SNIA HBA API Library Installation Guide* at the following URL for details on how to install the HBA API library:

<http://www.fujitsu.com/global/services/computing/storage/eternus/products/eternus-sf/cruiser/download/>

4.1.2.2 N-port settings

To connect Emulex Corporation LP7000, 8000, 9000, 9002L, 9802, 1050, 1050Ex, to a Fibre Channel switch, N-port settings are required on the HBA side.

To make up a SAN by connecting Emulex Corporation LP7000, 8000, 9000, 9002L, 9802, 1050, 1050Ex to the fibre channel switch, use the driver parameter in the registry to indicate explicitly that the topology is an N-port. The following indicates the procedure for setting the topology in the driver parameter:

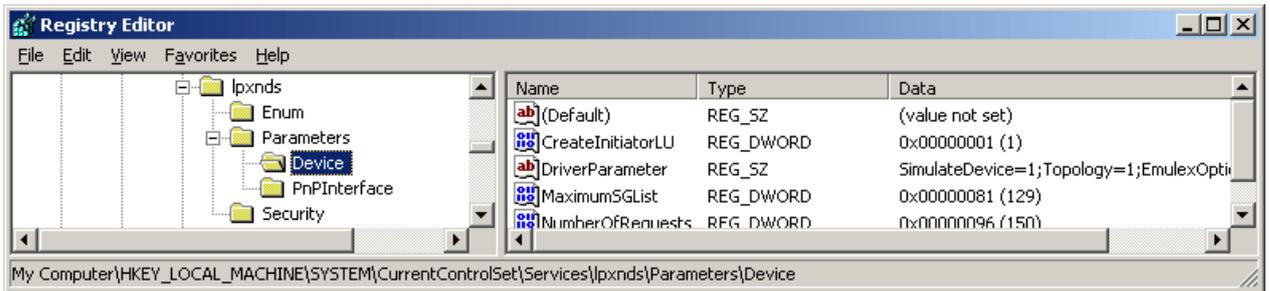
1. Open the registry editor.

Select [Start] - [Run...] from the task bar, and then execute the following:

regedit.exe

2. Open the keyword of the following registry key, and then set the Topology value to 1:

```
HKEY_LOCAL_MACHINE\  
System\  
  CurrentControlSet\  
    Services\  
      lpxnds\  
        Parameters\  
          Device\  
            "DriverParameter"      Topology=1
```



- The DriverParameter value depends on the version of the driver used. The Topology word may not exist depending on the driver version. In this event, the Topology word must be added. For details, refer to the readme file supplied with the driver or contact the HBA vendor.
- If the system accommodates more than one Emulex HBA and you want to connect them to Fibre Channel using different topologies, follow the above procedure for each HBA. For details, refer to the readme file supplied with the driver or contact the HBA vendor.
- The procedure involves changing the registry contents. Take particular care when carrying out the procedure because, if any part of the registry becomes corrupted as a result of an operation mistake or an operation that is not in the procedure, restarting the Windows system may not be possible.

4.1.3 Linux server node (host)

This software provides Linux server nodes with two management methods. In one method Agent is installed and in the other method Agent is not installed.

There is a difference in functionality depending on whether the agent was installed or whether it was not installed (with registration performed by manual embedding).



See

Refer to "3.2 Server node middleware for which management is possible" for information about the products that can be observed by Agent.

4.1.3.1 SNIA HBA API library settings

It is necessary to install the HBA API library that the HBA vander distributes to manage HBA installed in the Linux server node.

Refer to the *SNIA HBA API Library Installation Guide* at the following URL for details on how to install the HBA API library:

4.1.3.2 Using the udev device

Information

- The udev device is a Linux function that always assigns a fixed device name, even if the hardware configuration is changed.

It assigns a device name that starts with "/dev/disk", unlike for existing device names, such as "/dev/sda".

"/dev/disk/by-path/xxxxxxx" xxxxxxxx is information generated from the disk location information

"/dev/disk/by-id/yyyyyyy" yyyyyyyy is information generated from the disk ID information

In the following explanations, device names that start with "/dev/disk/by-path" are shown as "by-path", and device names that start with "/dev/disk/by-id" are shown as "by-id". Existing device names, such as "/dev/sda", are shown as compatible device names.

If the Linux udev function is used for devices monitored using Storage Cruiser, use "by-id".

"by-id" is a symbolic link to "/dev/sd?name", therefore the relationship for "by-id" and the compatible device name displayed in this software can be checked by using the "ls -l /dev/disk/by-id" command.

Example

The method shown below checks "by-id" for "/dev/sdb"

```
# ls -l /dev/disk/by-id/  
Total 0  
lrwxrwxrwx 1 root root 9 April 3 21:28 scsi-1FUJITSU_300000690000 -> ../../sdb  
lrwxrwxrwx 1 root root 10 April 3 21:28 scsi-1FUJITSU_300000690000-part1 -> ../../sdb1  
lrwxrwxrwx 1 root root 10 April 3 21:28 scsi-1FUJITSU_300000690000-part2 -> ../../sdb2  
lrwxrwxrwx 1 root root 10 April 3 21:28 scsi-1FUJITSU_300000690000-part3 -> ../../sdb3  
lrwxrwxrwx 1 root root 10 April 3 21:28 scsi-1FUJITSU_300000690000-part7 -> ../../sdb7  
lrwxrwxrwx 1 root root 9 April 3 21:28 scsi-1FUJITSU_300000690001 -> ../../sdc  
lrwxrwxrwx 1 root root 10 April 3 21:28 scsi-1FUJITSU_300000690001-part1 -> ../../sdc1  
lrwxrwxrwx 1 root root 10 April 3 21:28 scsi-1FUJITSU_300000690001-part2 -> ../../sdc2  
lrwxrwxrwx 1 root root 10 April 3 21:28 scsi-1FUJITSU_300000690001-part3 -> ../../sdc3  
lrwxrwxrwx 1 root root 10 April 3 21:28 scsi-1FUJITSU_300000690001-part7 -> ../../sdc7  
lrwxrwxrwx 1 root root 9 April 3 21:28 scsi-1FUJITSU_300000690002 -> ../../sdd  
lrwxrwxrwx 1 root root 10 April 3 21:28 scsi-1FUJITSU_300000690002-part1 -> ../../sdd1  
lrwxrwxrwx 1 root root 10 April 3 21:28 scsi-1FUJITSU_300000690002-part2 -> ../../sdd2  
lrwxrwxrwx 1 root root 10 April 3 21:28 scsi-1FUJITSU_300000690002-part3 -> ../../sdd3  
lrwxrwxrwx 1 root root 10 April 3 21:28 scsi-1FUJITSU_300000690002-part7 -> ../../sdd7
```

Accordingly, it is possible to determine that "by-id" of "/dev/sdb" is "/dev/disk/by-id/scsi-1FUJITSU_300000690000".

Point

- "by-path" for the device that is connected to the Fibre Channel switch may change, therefore specify "by-id".
- Linux device nodes are displayed as compatible device name "sd?" in this software. The "by-id" and "by-path" are not displayed. Check the relationship using the command as shown above.

4.1.4 HP-UX server node (host)

This software provides two methods for managing the HP-UX server node. In one method, Agent is installed on the node, in the other, it is not.

There is a difference in functionality depending on whether the agent was installed or whether it was not installed (with registration performed by manual embedding).



.....
Refer to "[3.2 Server node middleware for which management is possible](#)" for information on products that can be monitored by Agent.
.....

To manage the HBA mounted on an HP-UX server node, the HBA API library must be installed. When in doubt, contact your HBA sales representative.

4.1.5 AIX server node (host)

This software provides two methods for managing the AIX server node. In one method, Agent is installed on the node, in the other, it is not.

There is a difference in functionality depending on whether the agent was installed or whether it was not installed (with registration performed by manual embedding).



.....
Refer to "[3.2 Server node middleware for which management is possible](#)" for information on products that can be monitored by Agent.
.....

To manage the HBAs that are installed in AIX server nodes, the HBA API contained OS standard FC driver must be installed. Refer to the AIX manuals for details.

Execute the following command to check that HBA API is installed.

```
# /usr/bin/lslpp -l | /usr/bin/egrep -c "devices.common.IBM.fc.hba-api"
```

When the execution result is "1" or more, HBA API is already installed.



.....
On an AIX agent installed server, the following problems may occur:

- It takes lots of time to register a server.
- It takes lots of time to reload configuration.
- The HBA port information for a target server may not be properly recognized.

If any of those mentioned above is seen, check all the HBA ports for proper connection. If there is any fibre channel device corresponding to an HBA port that is not connected, delete it if possible. To check HBA port-fibre channel device correspondence, refer to the AIX document. In addition, if the server is restarted, this operation may be needed again.

[Example of deleting unused fibre channel device fcs3]

```
# /usr/sbin/rmdev -Rdl fcs3
```

If a problem does not fall under those mentioned above, refer to "[B.1 Troubleshooting information](#)" to collect analysis material and contact a Fujitsu system engineer.
.....

4.1.6 Other server nodes (hosts) (Supported OS or Solaris OS/Windows/Linux/HP-UX/AIX without Agent)

This software also provides a method for manually managing server nodes that are not supported by Agent or Solaris OS/Windows/Linux/HP-UX/AIX environments in which Agent is not installed.

Status inquiry or automatic reading of configuration data from a device cannot be performed, but the configuration can be changed by displaying the devices on the screen and manually editing the configuration.



.....
Refer to "[5.2.6 Registering a Manually Embedded Device](#)" for information on the procedure for registering the Managed Server without Agent.
.....

4.1.7 Softek Storage Cruiser's agent server node (host)

This software can manage server nodes on which Softek Storage Cruiser is installed. It can manage the all versions of the Agent.



.....
Refer to "Hardware requirements" in the *Softek Storage Cruiser User's Guide* for information on models which Softek Storage Cruiser's agent supports.
.....

The registered server node is managed as the Managed Server node only for monitoring, and displayed with the Web Console.



.....
Refer to "[5.2.1 Device search](#)" for information on the procedure for registering a serve node.
.....

4.1.8 VMware server node (host)

4.1.8.1 VMware Infrastructure 3 Version 3.0

This software installs Agents on the host operating system of VMware Infrastructure 3 Version 3.0 (VMware) server node and manages them.

The VMware server node is treated the same as the Linux server node in the following manuals.

- ETERNUS SF Storage Cruiser Operation Guide (This guide)
- ETERNUS SF Messages
- ETERNUS SF Event Guide



.....
Refer to "[4.1.3 Linux server node \(host\)](#)" for details of environmental settings.
.....



-
- This software cannot manage the guest operating system for VMware server node.

- This software operates both on the VMware server node and the Linux server node. However controllable middleware differs between them. Refer to "[3.2 Server node middleware for which management is possible](#)" for details.
-

4.1.8.2 VMware Infrastructure 3 Version 3.5 (or later), VMware vSphere 4 (or later) or VMware ESXi 3.5 (or later)

This software supports VMware Infrastructure 3 Version 3.5 (or later), VMware vSphere 4 (or later) and VMware ESXi 3.5 (or later).

If using VMware vSphere 4 or a later version, End to End display for the VM guests and storage devices can be supported by registering the VM host to the VMware vCenter Server.

It communicates directly with VMware ESX, VMware ESXi or VMware vCenter Server without using an Agent, and displays information about the VM host and VM guests.

Configuration management

This software communicates with the VM host (VMware ESX or VMware ESXi) to acquire information about the VM host itself and any VM guests (virtual machines and guest operating systems) on the VM host, and displays this information on the Web Console.

- Device registration

To register a VM host and its VM guests with this software, the IP address, login name and password of the VM host are required. By registering a VM host, all of the VM guests on the VM host are automatically registered.

It is not possible to register VM guests by specifying them individually.

For displaying the VM guests, the storage devices, and their End to End list:

- Registration of the VMware vCenter Server to which the VM host was registered is also necessary. An IP address, user name, and password are required for registering the VMware vCenter Server.
- When the VM host has been registered to the VMware vCenter Server using the IP address, specify the IP address registered to the VMware vCenter Server also when registering the VM host to this product.

If the IP address of a VM host is in IPv4 format, the IP addresses of its VM guests are displayed in the value that has set in IPv4 format.

If the IP address of a VM host is in IPv6 format, the IP addresses of its VM guests are displayed in the value that has set in IPv6 format.

- Device deletion

When VM hosts are deleted from this software, the VM guests on the VM host are automatically deleted.

When the VM guest is specified, its VM guest is only deleted from this software.

- Access path management

This software supports setting up, deleting and inheriting the access paths associated with the HBA for the VM host.

This software does not support access path management for VM guests because it does not support HBA management.

When the access path environment modification (setting up, deleting and inheriting) is executed, reboot the VM host or execute the following procedures by using VMware Infrastructure Client.

1. Select the "Configuration" tab
2. Select "Storage Adapters" from Hardware lists.
3. From Hardware lists, select the device corresponding to HBA that the access path setting was changed.
At this time, select the device of the same name as logical HBA number displayed in the Web Console.
4. Execute "Rescan" from pop-up menu.

Fault management

- Receiving SNMP Trap

The fault management by using SNMP Trap function is not supported.

- Device polling

This software supports device polling for VM hosts. Device polling can be used to determine whether communications are possible between the Manager and VM hosts.

If a VM host cannot communicate, its VM guests will also be treated as though they cannot communicate.

This software cannot detect status changes for VM guests because it does not support device polling for VM guests.

Using the Web Console, perform [Reload Conf.] for the relevant device, and confirm the latest information.

Changing environment

- Changing the host name or IP address

When the hostname or IP address of a VM host is changed, it is necessary to delete its VM host from this software and register its VM host again after changing the hostname or IP address.

When the VM guest virtual machine name, the guest OS's IP address, or the guest OS's host name have been changed, perform [Reload Conf.] for the relevant device by using the Web Console.

- New creation of VM guest

When creating a new VM guest, perform device deletion for the VM host which includes this VM guest, and then perform the device registration again by using the Web Console.

- User name and password

When the user name or password of the VM host has been changed, set the new username or password for this software using the Web Console.

- Moving VM guest between VM hosts

This software cannot detect automatically for moving VM guest between VM hosts by using VMware VMotion function and VMware HA function. Moved VM guest is treated as though it cannot communicate. Therefore, when moving of VM guest occurs regardless of the automatically or manually, perform the following procedures using the Web Console.

1. Delete the VM guest from its source VM host.
2. Delete a destination VM host of the VM guest, and then perform registration again.

Note

- It is recommended that VMware Tools be installed on the guest operating system.
- VMware Tools must be running on the guest operating system in order to display information about the guest operating system (such as the IP address, host name, and the name and version of the operating system).
- If VMware Tools is not running, the virtual machine name will be displayed in the [name] for VM guests. When VMware Tools is started, the host name for the guest operating system will be displayed in the [name] for VM guests.
- If the same format (IPv4 or IPv6) IP address as the VM host is not set to VM guests, the IP addresses of the VM guests are not displayed.
- If VMware Tools is running, the name and the version of the guest operating system are displayed in the [OS]. (The OS version is not displayed in the [OS Level].) If VMware Tools is not running, the system name and the version number of VMware are displayed in the [OS] and [OS Level]
- If VMware Tools has been installed, the [Status] of VM guests will be "Normal" if VMware Tools is running. If VMware Tools is stopped, the device status will change to "Stop" (even if the guest operating system is running).
- If VMware Tools has not been installed, then the [Status] of VM guests will be "Normal" if the virtual machine is running and "Stop" if the virtual machine is stopped, regardless of the [Status] of the guest operating system.
- When it is not possible to communicate with the VM host because of inconsistency for user name and password, the [Status] of the VM host and its VM guest becomes "Warning".
- If more than one network adapter is defined in the VM guest, an IP address of the VM guest will be displayed only one. The IP address assigned to the network adapter with the highest number among the valid network adapters defined in the VM guest will be displayed.

- When operating an Exchange Server Database Availability Group (hereinafter referred to as "DAG") in the VM guest environment;
 - Set the IP address for management of the VM guest and the IP address for the DAG to another network adapter each. Assign the IP address for management of the VM guest to the network adapter with the highest number.
 - If the VM guest is a single network adaptor environment, newly allocate the network adaptor to the VM guest, and operate the network adaptor separately for IP address for DAG and IP address for the management of the VM guest.
 - IP address of the VM guest displayed with this product might be IP address for DAG in the DAG environment. In that case, add a new network adaptor to the VM guest, and set IP address for the management of the VM guest to it again. Perform [Reload Conf.] with the Web Console after setting.
-

4.2 Fibre Channel switch

4.2.1 SN200 (Brocade) Fibre Channel switch

This software supports ETERNUS SN200 series Fibre Channel switch, and PRIMERGY Fibre Channel switch blade.

The settings that must be directly defined on the device side before this software manages these Fibre Channel switches are explained below. Refer to the manual supplied with the respective device for details.

4.2.1.1 Setting

IP address, subnet mask, and gateway address (required)

Define the IP address, subnet mask, and gateway address for a LAN. If the Fibre Channel switch is equipped with an operation panel, these settings can be defined from the operation panel. If the Fibre Channel switch is equipped with a serial port, define them by issuing the ipAddrSet command via the serial port.

User name and password for Fibre Channel switch control

For Fibre Channel switch control, this software is used to log in using telnet to the device. Control requires a user name and password of the administrator security level. The factory default settings of user name and password are "admin" and "password", respectively.

If the password has been changed on the device side, when perform [Reload Conf.] for the relevant device with the Web Console, this software recognizes the change and the device status becomes a Warning display.

In order for the setting to match the changed device setting, perform a change to the account information for device management using the Web Console.

For some types of devices, the change of the password on the device side cannot be recognized automatically. Change the device management account information in the Web Console for these devices.

When connected to a cascade, some types of devices cannot automatically recognize the changed password. In this case, delete the device and register it again. Refer to "[5.2 Registering device](#)" for details on deleting and registering devices.

Domain name

A domain name is a unique name defined for a Fibre Channel switch in a SAN. Such names are necessary for a cascade connection of multiple Fibre Channel switches. Since domain names are automatically defined by firmware built into the individual Fibre Channel switches, the name need not be considered during definition and management of access paths using this software.

However, the domain names are important elements in manual port zoning. In such cases, make sure that no identical value is set for any two Fibre Channel switches in the cascade connection. If a Fibre Channel switch is equipped with an operation panel, a domain name can be set from the operation panel. If a Fibre Channel switch is equipped with a serial port or if network settings are defined for the Fibre Channel switch, log in to the switch, and set a domain name by executing the configure command.

SysName (recommended)

Register a switch name for Fibre Channel switch control. This software uses this switch name as SysName. SysName should be a name that is not identical to any other name registered with this software. If the Fibre Channel switch is equipped with an operation panel, a switch name can be set from the operation panel. If the Fibre Channel switch is equipped with a serial port or if the network settings are defined for the Fibre Channel switch, log in to the switch, and set a switch name by executing the switchName command.

Zoning setting

Zoning is recommended.

No zoning may be set for Fibre Channel switches. When Fibre Channel switches that are not set the zoning are connected to server nodes or storage devices, they are placed in a state where their security levels are undefined (which makes all of the Fibre Channel switches accessible from every server node). To prevent inadvertent access from destroying data on the storage side, recommend to set the temporary zone as follows. By this setting, it is able to stop all access paths of the Fibre Channel switches. After defining this setting, connect the server node and storage device to the Fibre Channel switch, and set up an access path using this software. When setting up a cascade connection between the Fibre Channel switch and another Fibre Channel switch for which zoning is already set, you need not define this setting because zoning information is copied. The setting is also not necessary if the default of zoning mode is set to "No Access" on the Default Zone function of the Fibre Channel switch.

```
zoneCreate"SNM_0001", "00:0B:00:00:0E:00:00:00;00:0C:00:00:0E:00:00:00"  
cfgCreate"SNM_BCSI", "SNM_0001"  
cfgEnable"SNM_BCSI"  
cfgSave
```

If the Fibre Channel switches are to be cascaded for operation, cascade the switches before executing the above command. Execute this command on a Fibre Channel switch where the latest firmware has been installed.



- If the temporary zone has been created, all accesses will be blocked. For this reason, do not implement this measure while the target Fibre Channel switch environment is operating. Implement this measure either immediately after the Fibre Channel switch environment has been installed and before operations have started (or while operations are paused).
- The host affinity and zoning operation command (storageadm zone) in the ["Chapter 11 Command References"](#) cannot be used for the following Fibre Channel switches. In this cases, set the temporary zone.
 - Fibre Channel switches that the temporary zone is not set
 - Fibre Channel switches that default of zoning mode is not set to "No Access" on the Default Zone function

SNMP community setting

This software handles fibre channel switches and SNMP transmissions.

The name of the SNMP Community used for SNMP transmission is specified when registering the switch or is set in the setting file (sanma.conf). If the SNMP Community settings in the sanma.conf are at their defaults, this software communicates by using "public" or "private" for the SNMP Community name.

To change the SNMP Community name, change the settings on the device side, and adjust the settings of this software accordingly. It is possible to change the settings of this software from the Web Console if the device for which you are changing the settings is an ETERNUS Disk storage system. If you change the setting for devices besides an ETERNUS Disk storage system, refer to ["SNMP_COMMUNITY_NAME_FOR_IP"](#) in ["A.2 sanma.conf Parameter"](#).

SNMP-MIBsetting

For the SNMP-MIB setting of the Fibre Channel switch (except for ETERNUS SN200 model 250M and Brocade AP7420), set the following by specifying the telnet command "snmpConfig --set mibCapability" or "snmpMibCapSet". Specify "yes" for the "FA-MIB", "HA-MIB" and "SW-TRAP" items. Leave the other items unspecified. Simply press ENTER for these unspecified items.

```
sn200:admin> snmpConfig --set mibCapability  
The SNMP Mib/Trap Capability has been set to support  
(omitted)  
FA-MIB (yes, y, no, n): [yes] yes  
FICON-MIB (yes, y, no, n): [yes]
```

```
HA-MIB (yes, y, no, n): [yes] yes
FCIP-MIB (yes, y, no, n): [no]
ISCSI-MIB (yes, y, no, n): [no]
SW-TRAP (yes, y, no, n): [yes] yes
  swFCPortScn (yes, y, no, n): [yes]
  swEventTrap (yes, y, no, n): [yes]
  swFabricWatchTrap (yes, y, no, n): [yes]
  swTrackChangesTrap (yes, y, no, n): [yes]
(omitted)
sn200:admin>
```

The output of the above command may depend on the firmware version of the Fibre Channel switch. Change the settings of only the "FA-MIB", "HA-MIB" and the "SW-TRAP" items.

Note that if HA-MIB items are not displayed, HA-MIB settings are not required.

If "FA-MIB" is not "yes", physical connection information, port zoning information, and port speed (transfer rate) information on each port of the Fibre Channel switch is erroneously recognized.

The fault monitoring function will only run if "SW-TRAP" is set to "yes".

The director performance management function will only run if HA-MIB is set to "yes".

4.2.1.2 Zoning

This software uses the one-to-one WWPN zoning of the Fibre Channel switch as the basis for setting up and removing access paths (logical paths). However, it also supports other types of zoning settings at their respective levels. The functions that it supports for the different types of zoning are as follows:

No zoning setting (With this software, this is called the "no security state".)

This is a state that has no zoning setting. In this state, the Fibre Channel switch permits access between all ports. It is the factory default setting. However, if a Fibre Channel switch is connected in cascade to another Fibre Channel switch with a zoning setting, the zoning setting information is copied when cascade connection communication is established.

This software can perform management normally for the Fibre Channel switches without a zoning setting. Also, when registering a Fibre Channel switch with this software, you can specify whether to set zoning in response to a subsequent software attempt to set up an access path.

With no zoning setting, the Fibre Channel switch operates with security management delegated to the binding and affinity capabilities of server nodes and storage devices.

WWPN zoning setting

The WWPN zoning setting is a method by which zoning is defined based on the WWPN of a Fibre Channel port. A WWPN value that is unique throughout the world is defined for each port. As a result, no wrong access path is created even if the port connection place of the Fibre Channel switch is changed.

All access path control functions of this software are effective for access paths defined in the one-to-one WWPN zoning setting. For other defined access paths, this software can read access and display path information, but it cannot delete and inherit the access paths. However, it is possible to delete only zoning setup.

Port zoning setting

The port zoning setting is a method by which zoning is defined based on the specification of the port connection place of the Fibre Channel switch. A new port zoning setting must be defined if the port connection place of the Fibre Channel switch is changed.

As for the access path control functions, this software can read information about access paths for which port zoning is set, display the paths, and manage their status, but it cannot delete and inherit the access paths. However, it is possible to delete only zoning setup.

WWNN zoning setting

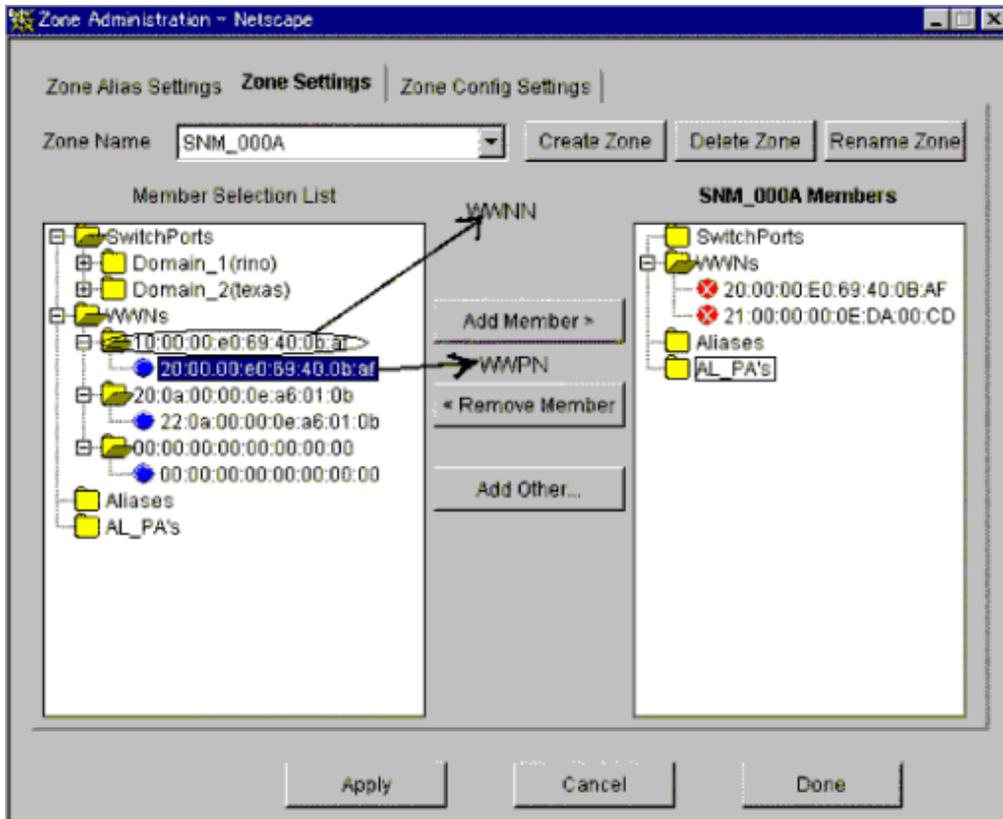
The WWNN zoning setting is a method by which zoning is defined based on the WWNN of a Fibre Channel port. Though a WWNN can be shared by several Fibre Channel ports, its definition differs from company to company.

As for the access path control functions, this software cannot display or delete access paths for which WWNN zoning is set. However, it can perform fault management of the Fibre Channel switch.

Different types of zoning settings can be defined for the Fibre Channel switch. To allow this software to provide complete zoning security, however, changing the existing zoning setting to the one-to-one WWPN zoning setting is recommended.

The zoning setting can be defined in the Zone Administration window of WEBTOOLS of the Fibre Channel switch. Note that settings in WEBTOOLS are dependent on the device and firmware.

For example, in the WEBTOOLS window of SN200M40 (v2.4) shown below, WWPNs are the values indicated by blue round disks on the Member Selection List and WWNNs are the values displayed next to the folder icons above the blue round disks.



4.2.1.3 Problem-handling (FAQ)

The device cannot be detected

- Check whether the SNMP Community settings on the device side agree with the settings of this software. Refer to "[SNMP community setting](#)" for details.
- For devices that do not support [Detect device in subnet] as described in "[1.2.6 Support levels](#)", use the IP address assignment.
- Check whether the Ethernet port communication speed has been set correctly.
- When setting the SNMP access control list, confirm the access from the manager is permitted.

A Warning for a device is displayed

- Check whether a hardware error (FC port, FAN, power supply, temperature, etc.) has occurred.
- Confirm whether or not the password is changed on the device side. If the password is changed on the device side, refer to "[User name and password for Fibre Channel switch control](#)" and change the registration information of this software.
- When the device is powered on or rebooted, initialization is performed in the device. perform [Reload Conf.] for the relevant device with the Web Console while the initialization is being performed, a Warning message for the device may appear. If no error occurs on the device, perform [Reload Conf.] for the relevant device using the Web Console after device initialization. The display then becomes Normal.

A Warning for an access path is displayed

- There is no zoning setting for configuring the access path.
- If a Warning is displayed on the screen, refer to "[A Warning for a device is displayed](#)".

An Error in an access path is displayed

- Check whether all the Fibre Channel switches connected in cascade are registered in this software. Register all the Fibre Channel switches that have not been registered.
- Make sure that the device in an access path is powered on and there is no problem with the LAN connection. Furthermore, check whether the SNMP Community settings on the device side agree with the settings of this software. Refer to "[SNMP community setting](#)" for details.
If the network communication is disabled because of device replacement or maintenance, the physical connection line is not displayed.

A Warning for a server node is displayed (in yellow)

- Refer to "[An Error in an access path is displayed](#)".

When changing SNMP Community of a device

- Refer to "[SNMP community setting](#)".

When changing the password of a device

- Refer to "[User name and password for Fibre Channel switch control](#)".

When PG-FCD101 or PG-FCD102 is not displayed

- Check whether there are zoning settings in the Fibre Channel switch that is connected to PG-FCD101 or PG-FCD102. If there are no zoning settings, refer to "[Zoning setting](#)" and then create a temporary zoning.



Note

- The ETERNUS SN200 series, Brocade Fibre Channel switch can define six monitoring device addresses (SNMP Trap transmission places) per device and a different SNMP Community name for each of these addresses. This software must be used by overwriting the entry where the name of SNMP Community is set in this public. If the device side is designed to change the name of SNMP Community of public and accordingly the settings of this software, the entry with the changed name of SNMP Community will be used.
- The ETERNUS SN200 series, Brocade Fibre Channel switch features the QuickLoop function that accomplishes FC-AL hub emulation. However, this software does not support Fibre Channel switches for which this function is enabled.
- This software communicates with the Fibre Channel switch using SNMP and telnet.
- It is recommended of Fibre Channel switch redundancy (cascading).

At present, the Fibre Channel switch zoning information cannot be restored from the database of this software. Therefore, multiple Fibre Channel switches must be connected in cascade to prevent the zoning information stored on the Fibre Channel switches from being erased. The zoning information is stored separately on each of the Fibre Channel switches connected in cascade. Even if one of the Fibre Channel switches fails, the zoning information is stored by the other switches.

The Fibre Channel switch zoning information is changed using the access path setting. When cascade connection is not used, be sure to save the device configuration information (configUpload file) after making changes in the settings. Refer to the manuals that come with the device for details on storing configuration information.

However, cascade connections should not be implemented between two or more ETERNUS VS900 model 300.

- To manage Fibre Channel switches with this software, all the Fibre Channel switches that are connected in cascade must be registered with this software. If any Fibre Channel switch is connected in cascade but not registered with this software, the SAN environment cannot be correctly managed.
- In consideration of incompatibility of Fibre Channel switch firmware, this software checks the firmware version number. If this software detects firmware that it does not support, all functions including the configuration management is restricted. The following message is output to the event log. (XXXXXXX is the version number of the detected firmware.)

"Unsupported Firmware Version XXXXXX"

Contact your Fujitsu CE or SE because patches need to be applied to this software.

- The FC routing function is not supported.

If a cascade is connected using the FC routing function, the cascade connection line is not displayed in the Web Console.

For this reason, an error is displayed for the access path that goes through the cascade connection line, and a Warning is displayed for the server node that is used to configure the access path.

- To the GbE port, It may takes a time till SNMP Trap is notified.

Following SNMP traps are displayed in the event log when execute disconnect/connect FC cable in a short time.

- When the cable is disconnected : [Link Down Trap]
- When the cable is connected : [Link Up Trap]

The port where the trouble occurs cannot be specified from the event log, also the event linkage function does not operate. Login to the Fibre Channel switch to specify the port where the trouble occurs, and confirm the state of the VE port and the GbE port.

* Also following event logs are displayed with above event log.

- When the cable is disconnected : [FC Port No.214 Offline]
- When the cable is connected : [FC Port No.214 Online]

- For GbE ports that are used in the FCIP tunneling function, virtual FC ports are displayed in the Web Console as follows.

Device	Number of virtual FC ports
SN200 model 450M Brocade 7500	16 (*1)
Brocade 7800	8
FCR/FCIP Blade (This is installed in SN200 model 540)	16 (*1)
Extension Blade (FC 8Gbps) (This is installed in Brocade DCX series)	20

*1: For firmware versions prior to v5.2.0, a Warning is displayed in the Web Console for the FC ports for which the FCIP tunneling function is disabled. Monitor the occurrence of errors using SNMP Trap.

- [1Gbit/s] is displayed as the VE port transfer speed.
- This software does not support the Administrative Domain (Admin Domain).

4.2.2 PRIMERGY Fibre Channel switch blade

Refer to "4.2.1 SN200 (Brocade) Fibre Channel switch" for information on how to set up the environment.

4.2.3 Brocade VDX series

This product supports the Brocade VDX series.

The following is a description of the items required to be preconfigured directly to the device side to manage the Brocade VDX series with this product. Refer to the manual provided with the device for details of those items.

4.2.3.1 Setting

Connecting to the Network (required)

Make the required settings for the Brocade VDX series which you use to connect to a network, and then connect to the network. Refer to the manuals provided with the respective devices for details on the setting method.

User name and password for Fibre Channel switch control

For Fibre Channel switch control, this software is used to log in using SSH to the device. Control requires a user name and password of the administrator security level. The factory default settings of user name and password are "admin" and "password", respectively.

If the password has been changed on the device side, when perform [Reload Conf.] for the relevant device with the Web Console, this software recognizes the change and the device status becomes a Warning display.

In order for the setting to match the changed device setting, perform a change to the account information for device management using the Web Console.

SysName (recommended)

Register a host name for Fibre Channel switch control. This software uses this host name as SysName. SysName should be a name that is not identical to any other name registered with this software.

Refer to the manuals provided with the respective devices for details on the setting method.

Zoning setting

Zoning is recommended.

No zoning may be set for Fibre Channel switches. When Fibre Channel switches that are not set the zoning are connected to server nodes or storage devices, they are placed in a state where their security levels are undefined (which makes all of the Fibre Channel switches accessible from every server node).

To prevent inadvertent access from destroying data on the storage side, recommend to set the temporary zone as follows.

By this setting, it is able to stop all access paths of the Fibre Channel switches. After defining this setting, connect the server node and storage device to the Fibre Channel switch, and set up an access path using this software.

When setting up a cascade connection between the Fibre Channel switch and another Fibre Channel switch for which zoning is already set, you need not define this setting because zoning information is copied.

The setting is also not necessary if the default of zoning mode is set to "No Access" on the Default Zone function of the Fibre Channel switch.

```
VDX-Sw# configure terminal
Entering configuration mode terminal
VDX-Sw(config)# zoning defined-configuration zone SNM_0001
VDX-Sw(config-zone- SNM_0001)# member-entry 00:0B:00:00:0E:00:00:00
VDX-Sw(config-zone-SNM_0001)# member-entry 00:0C:00:00:0E:00:00:00
VDX-Sw(config-zone-SNM_0001)# exit
VDX-Sw(config)# zoning defined-configuration cfg SNM_BCSI
VDX-Sw(config-cfg-SNM_BCSI)# member-zone SNM_0001
VDX-Sw(config-cfg-SNM_BCSI)# exit
VDX-Sw(config)# zoning enabled-configuration cfg-name SNM_BCSI
VDX-Sw Updating flash ...
VDX-Sw(config)# end
VDX-Sw#
```

If the Fibre Channel switches are to be cascaded for operation, cascade the switches before executing the above command.

Note

- If the temporary zone has been created, all accesses will be blocked. For this reason, do not implement this measure while the target Fibre Channel switch environment is operating. Implement this measure either immediately after the Fibre Channel switch environment has been installed and before operations have started (or while operations are paused).

- The host affinity and zoning operation command "[11.1.1.4 storageadm zone \(Host affinity and zoning operation command\)](#)" cannot be used for the following Fibre Channel switches. In this cases, set the temporary zone.
 - Fibre Channel switches that the temporary zone is not set
 - Fibre Channel switches that default of zoning mode is not set to "No Access" on the Default Zone function

SNMP Trap Settings

Although SNMP Trap is used in fault monitoring, the SNMP Trap send destination address automatic settings function is not supported for Brocade VDX series.

In order for SNMP Trap to be sent to the Management Server, log in to the device, execute the following commands in the given sequence, and then set the SNMP Trap send destination address.

If the Management Server is defined as a cluster, the logical IP address of the cluster needs to be set.

```
switch# configure terminal
switch(config)# snmp-server host [SNMP Trap send destination address] public version 1 udp-port 162
severity-level Warning
switch(config)# exit
```

Refer to the manuals provided with the respective devices for details on the setting method.

SNMP community setting

If the SNMP Community settings in the sanma.conf are at their defaults, this software communicates by using "public" for the SNMP Community name.

To change the SNMP Community name, change the settings on the device side, and adjust the settings of this software accordingly. It is possible to change the settings of this software from the Web Console if the device for which you are changing the settings is an ETERNUS Disk storage system. If you change the setting for devices besides an ETERNUS Disk storage system, refer to "[SNMP_COMMUNITY_NAME_FOR_IP](#)" in the "[A.2 sanma.conf Parameter](#)".

4.2.3.2 Zoning

This software uses the one-to-one WWPN zoning of the Fibre Channel switch as the basis for setting up and removing access paths (logicalpaths). However, it also supports other types of zoning settings at their respective levels. The functions that it supports for the different types of zoning are as follows:

No zoning setting

This is a state that has no zoning setting.

In this situation, if the default zoning mode is set to All Access, access is permitted across all the ports of the fibre channel switch. (This product refers to this situation as No Security status)

If the default zoning mode is set to No Access, access is blocked across all the ports of the Fibre Channel switch.

In the case of "No Access" or "All Access", if a Fibre Channel switch is connected in cascade to another Fibre Channel switch with a zoning setting, the zoning setting information is copied when cascade connection communication is established.

This software can perform management normally for the Fibre Channel switches without a zoning setting. Also, when registering a Fibre Channel switch with this software, you can specify whether to set zoning in response to a subsequent software attempt to set up an access path. With no zoning setting, the Fibre Channel switch operates with security management delegated to the binding and affinity capabilities of server nodes and storage devices.

WWPN zoning setting

The WWPN zoning setting is a method by which zoning is defined based on the WWPN of a Fibre Channel port.

A WWPN value that is unique throughout the world is defined for each port. As a result, no wrong access path is created even if the port connection place of the Fibre Channel switch is changed.

All access path control functions of this software are effective for access paths defined in the one-to-one WWPN zoning setting. For other defined access paths, this software can read access and display path information, but it cannot delete and inherit the access paths.

However, it is possible to delete only zoning setup.

WWNN zoning setting

The WWNN zoning setting is a method by which zoning is defined based on the WWNN of a Fibre Channel port. Though a WWNN can be shared by several Fibre Channel ports, its definition differs from company to company.

As for the access path control functions, this software cannot display or delete access paths for which WWNN zoning is set.

Point

.....
In Brocade VDX series, the WWNN zoning can be set. To allow this software to provide complete zoning security, however, changing the existing zoning setting to the one-to-one WWPNN zoning setting is recommended.
.....

4.2.3.3 Problem-handling (FAQ)

The device cannot be detected

- Check whether the SNMP Community settings on the device side agree with the settings of this software. Refer to "[SNMP community setting](#)" for details.
- Check whether the Ethernet port communication speed has been set correctly.

A Warning for a device is displayed

- Check whether a hardware error (FC port, FAN, power supply, temperature, etc.) has occurred.
- Confirm whether or not the password is changed on the device side. If the password is changed on the device side, refer to "[User name and password for Fibre Channel switch control](#)" and change the registration information of this software.
- When the device is powered on or rebooted, initialization is performed in the device. perform [Reload Conf.] for the relevant device with the Web Console while the initialization is being performed, a Warning message for the device may appear. If no error occurs on the device, perform [Reload Conf.] for the relevant device using the Web Console after device initialization. The display then becomes Normal.

A Warning for an access path is displayed

- There is no zoning setting for configuring the access path.
- If a Warning is displayed on the screen, refer to "[A Warning for a device is displayed](#)".

An Error in an access path is displayed

- Check whether all the Fibre Channel switches connected in cascade are registered in this software. Register all the Fibre Channel switches that have not been registered.
- Make sure that the device in an access path is powered on and there is no problem with the LAN connection. Furthermore, check whether the SNMP Community settings on the device side agree with the settings of this software. Refer to "[SNMP community setting](#)" for details.

At the registration process, check whether the device user name and password is changed or not. For more information, refer to "[User name and password for Fibre Channel switch control](#)".

If network communication is disabled due to the maintenance of device replacement, this error occurs.

When changing SNMP Community of a device

- Refer to "[SNMP community setting](#)".

When changing the password of a device

- Refer to "[User name and password for Fibre Channel switch control](#)".

Note

-
- The connecting information is not displayed if connection type not supported by the device.

- This product manages the device with the use of SNMP protocol version 1, SSH. For fault monitoring by SNMP trap, SNMP protocol version 1 is also used.
- This product supports only the operation mode in VCS modes. The standalone mode is not supported.
- The switches managed by this product are all managed as a Fibre Channel switch.
- This product manages RBridgeID as a domain ID.
- It is recommended of Fibre Channel switch redundancy (cascading).
At present, the Fibre Channel switch zoning information cannot be restored from the database of this software. Therefore, multiple Fibre Channel switches must be connected in cascade to prevent the zoning information stored on the Fibre Channel switches from being erased. The zoning information is stored separately on each of the Fibre Channel switches connected in cascade. Even if one of the Fibre Channel switches fails, the zoning information is stored by the other switches.
The Fibre Channel switch zoning information is changed using the access path setting. When cascade connection is not used, be sure to save the device configuration information after making changes in the settings. Refer to the manuals that come with the device for details on storing configuration information.
- To manage Fibre Channel switches with this software, all the Fibre Channel switches that are connected in cascade must be registered with this software. If any Fibre Channel switch is connected in cascade but not registered with this software, the connection cannot be correctly managed.
- The beacon function is not supported.
- If the user is logged on to the Fibre Channel switch using telnet or ssh, the Fibre Channel switch information cannot properly be obtained nor configured.
- The FC routing function is not supported.
If a cascade is connected using the FC routing function, the cascade connection line is not displayed in the Web Console. For this reason, an error is displayed for the access path that goes through the cascade connection line, and a Warning is displayed for the server node that is used to configure the access path.
- If the transfer speed of FC port is configured by the Auto Negotiation function, this product displays the maximum transfer speed of FC port configured by the Auto Negotiation function.
- FCoE port is not displayed.
- As for the Ethernet port and FC port number, the following values are displayed in the Web Console based on the Index value output by "show fabric islports" command of Brocade VDX series.
 - When index value starts from 0 : Index value + 1
 - When index value starts from 1 : Index value
- For Brocade VDX series firmware version 3.0.1 or later, if port disconnection or connection is done, the following SNMP traps alone are displayed in the event log:
 - Cable disconnected : [Link Down Trap]
 - Cable connected : [Link Up Trap]

At this time, a failing port cannot be located from the event log. Also, the function in conjunction with event does not work. To locate the failing port, login to the Fibre Channel switch to check the port status.
- 1GbE RJ45 port is not displayed.



4.2.4 PRIMERGY BX Ethernet Fabric Switch

Refer to "[4.2.3 Brocade VDX series](#)" for information on how to set up the environment.

4.2.5 SN200 MDS(Cisco MDS) Fibre Channel switch

This software supports the ETERNUS SN200 MDS fibre channel switch and Cisco MDS fibre channel switch.

The following section explains the settings required beforehand for managing these fibre channel devices on this software. Refer to the manual supplied with the device for detailed information on these items.

4.2.5.1 Settings

IP address, subnet mask, and gateway address (required)

Specify the IP address of LAN, subnet mask, and gateway address. Log in to the fibre channel switch device from the serial port, and specify them using the ip address command. Use the following procedure to specify the IP address.

```
switch# config t
switch(config)# ip default-gateway [gateway address]
switch(config)# interface mgmt 0
switch(mgmt 0)# ip address [IP address] [subnet mask]
switch(mgmt 0)# exit
switch(config)# exit
```

SysName (recommended)

Register the device name for the fibre channel switch management. This device name is used as SysName of this software. This name should not overlap with other target items for management. Log in to the fibre channel switch, and specify the device name using the switchname command. Use the following procedure to specify the device name.

```
switch# config t
switch(config)# switchname [device name]
switch(config)# exit
```

SNMP Community setting

This software handles fibre channel switches and SNMP transmissions. The name of the SNMP Community used for SNMP transmission is specified when registering the switch or is set in the setting file (sanma.conf). If the SNMP Community settings in the sanma.conf are at their defaults, this software performs transmissions with the SNMP Community name "public." It uses "public" for reading the device information.

The Community name "public" for this fibre channel switch is not registered at factory shipment. Use the following procedure for registering the Community name.

```
switch# config t
switch(config)# snmp-server community public
switch(config)# exit
```

To change the SNMP Community name, change the setting of the device, and also change the setting of this software accordingly. Refer to "[SNMP_COMMUNITY_NAME_FOR_IP](#)" in the "[A.2 sanma.conf Parameter](#)" for information on the settings of this software.

SNMP Trap send destination setting

SNMP Trap is used for error monitoring. However, this fibre channel switch does not support the automatic setting function of the SNMP Trap send destination address. Register the SNMP Trap send destination address by using the following procedure.

```
switch# config t
switch(config)# snmp-server host [IP address of the Managed Server] traps version 1 public
switch(config)# exit
```

SNMP Trap filter setting

The SNMP Trap filter for this fibre channel switch is set up at factory shipment. However, this software cannot perform proper error monitoring with the SNMP Trap filter setting at factory shipment. Change the SNMP Trap filter setting by using the following procedure.

```
switch# config t
switch(config)# snmp-server enable traps entity fru
```

```
switch(config)# snmp-server enable traps fcdomain
switch(config)# snmp-server enable traps license
switch(config)# snmp-server enable traps vrrp
switch(config)# snmp-server enable traps link ietf-extended
switch(config)# exit
```

4.2.5.2 Problem-handling (FAQ)

When the device cannot be detected

- Check whether the SNMP Community settings on the device side match the settings of this software. Refer to "[SNMP Community setting](#)".
- Check whether the Ethernet port communication speed has been set correctly.

When a Warning for a device is displayed

- Check whether a hardware error (FC port, FAN, power supply, temperature) has occurred.
- When the device is powered on or rebooted, initialization is performed in the device. Perform [Reload Conf.] for the relevant device with the Web Console during the execution of the initialization process, a Warning message for the device may appear. If no error occurs on the device, the Web Console performs [Reload Conf.] again. After initialization of the device. The display then becomes Normal.

When changing SNMP Community of a device

- Refer to "[SNMP Community setting](#)".

Note

- Use SNMP protocol version 1 for managing the device. For error monitoring with SNMP Trap, also use SNMP protocol version 1.
- The management is performed with SNMP communication only. You do not have to log in to the device through TELNET. When you register with this software, you do not have to enter your user name or password.
- Use the ping command for polling monitoring.
- Zoning management is not supported. Refer to the manual supplied with the device for information on how to display the zoning information or to set up zoning. When the access path is set up, only the settings of server and storage are changed.
- The operations of cascade connection are not supported. Even if the device is connected in cascade, the information about cascade connection is not properly displayed. As a result, the access path through the cascade connection is not properly displayed.
- The access path display of a manually embedded device is not supported.
- On the related management window, the path search function and End to End list display function are not supported.
- The performance information cannot be referenced using Systemwalker Service Quality Coordinator.
- The beacon function is not supported.

4.2.6 McDATA Fibre Channel switch

This software supports McDATA Fibre Channel switch.

The items that must be set in the device to manage these Fibre Channel devices in this software are explained below. Refer to the manual included with the device for details about these items.

4.2.6.1 Settings

IP address, subnet mask, and gateway address (required)

The LAN IP address, subnet mask, and gateway address are set. Log on to the Fibre Channel switch device from the serial port, and configure the settings using the `config ip ethernet` command. Set the IP address using the following procedure.

```
switch# config ip ethernet [IP address] [Gateway address] [Subnet mask]
```

Domain name

A domain name is a unique name defined for a Fibre Channel switch in a SAN. Such names are necessary for a cascade connection of multiple Fibre Channel switches.

Set a value that is not duplicated inside the Fibre Channel switch to be cascaded. To use a cascade connection, log on to the Fibre Channel switch, and configure the settings using the `config switch prefDomainId` command. Set the domain name according to the procedure shown below.

```
switch# config switch prefDomainId [Domain name]
```

SysName (recommended)

Register the device name used for Fibre Channel switch management. This device name is used as SysName in this software. It is recommended that you register a name that is not a duplicate of another management target.

Log on to the Fibre Channel switch and configure the settings using the `config system name` command. Set the device name using the following procedure.

```
switch# config system name [Device name]
```

SNMP community settings (required)

This software handles fibre channel switches and SNMP transmissions.

The name of the SNMP Community used for SNMP transmission is specified when registering the switch or is set in the setting file (`sanma.conf`). If the SNMP Community settings in the `sanma.conf` are at their defaults, this software performs transmissions with the SNMP Community name "public." It uses "public" for reading the device information.

The SNMP Trap send destination address must also be specified for the command used to set the SNMP Community name. For this reason, the settings shown in "[SNMP Trap send destination settings](#)" below are also required.

Set the SNMP Community name using the following procedure.

```
switch# config snmp addCommunity [Registration number] public enabled [SNMP Trap send destination address] 162
```

To change the SNMP Community name, change the device settings, and change the settings of this software to match. Refer to "[SNMP_COMMUNITY_NAME_FOR_IP](#)" in "[A.2 sanma.conf Parameter](#)" for details about changing the settings of this software.

SNMP Trap send destination settings

Although SNMP Trap is used in fault monitoring, the SNMP Trap send destination address automatic settings function is not supported for this Fibre Channel switch. Register the SNMP Trap send destination address using the following procedure.

```
switch# config snmp addCommunity [Registration number] public enabled [SNMP Trap send destination address] 162
```

4.2.6.2 Problem-handling (FAQ)

When a device cannot be detected:

- Check whether the SNMP Community settings on the device side match the settings of this software. Refer to "[SNMP community settings \(required\)](#)" for details.
- Check whether the Ethernet port communication speed has been set correctly.

When a Warning for a device is displayed:

- Check whether a hardware fault (for the FC port, FAN, power, or temperature) has occurred.
- Initialization processing is performed internally in the device when the device is powered on or restarted.
When performing [Reload Conf.] for the relevant device with the Web Console during the execution of the initialization process, a Warning may be displayed for the device.
If an error has not occurred in the device, the display is back to Normal by executing [Reload Conf.] for the relevant device with the Web Console after completing initialization for the device.

When changing the SNMP Community of a device:

- Refer to "[SNMP community settings \(required\)](#)".



Note

- Devices are managed using SNMP protocol version 1. SNMP Trap fault monitoring also uses SNMP protocol version 1.
- Since management is only performed using SNMP communication, there is no TELNET logon to the device. For this reason, there is no need to enter a user name or password when registering the device this software.
- ping is used for the polling monitoring.
- Zoning management is not supported. Before displaying zoning information or configuring zoning settings, refer to the manual included with the device first. If the access path has been set, only the settings for server and storage are changed.
- Display of the manually embedded device access path is not supported.
- The path search function and the End to End list display function are not supported in the relationship management window.
- The beacon function is not supported.
- 140 ports are used for McDATA Intrepid 6140 Fibre Channel switch, but 144 ports are displayed in the Web Console. Of these, 4 ports, numbers 128 to 131, are ports that do not actually exist. This port information in the window is all dummy information.
- 12 ports from the 132nd to the 143rd of the McDATA Interpid 6140 are implemented on the back side of the device, but all ports are displayed in the Web Console as they are implemented on the front side.

4.3 Disk Array

4.3.1 Disk array ETERNUS DX series, ETERNUS2000, ETERNUS4000, ETERNUS8000

4.3.1.1 Setting

To manage the ETERNUS DX series, ETERNUS2000, ETERNUS4000 and ETERNUS8000 with this software, set up devices while keeping in mind the points listed below.



See

Refer to the ETERNUS Web GUI manual supplied with the respective device for settings details.

1. Community setting in SNMP (Agent) environment settings

This software communicates with the ETERNUS product by using "public" for the Community name at an initial value. Therefore, the Community name setting on the ETERNUS product side must be either of the ones explained following a and b. Note that the

Community name can be changed. For information on changing the Community name, refer to following c and "SNMP_COMMUNITY_NAME_FOR_IP" parameter in sanma.conf at "A.2 sanma.conf Parameter".

In addition, for ETERNUS DX80 S2/DX90 S2, ETERNUS DX400 S2 series and ETERNUS DX8000 S2 series, set "ViewALL" in the MIB view to the Community name.

- a. Any Community is not set. (default)
"Public" (Access: read Only, address: all hosts, and view: all Object) is set by an initial value.
However, "Public" is not set by an initial value without the Community setting in case of ETERNUS DX80 S2/DX90 S2, ETERNUS DX400 S2 series, ETERNUS DX8000 S2 series. Set one of b or c for the Community setting.
- b. Specify "public" for the Community name explicitly.
In this case, specify either the IP address of the Management Server on which Manager is installed or 0.0.0.0 (to receive messages from all hosts) as the IP address.
- c. Specify other than "public" for the Community name explicitly.
The Management Server is specified with the Community name and the Management Server's IP address. However, when the manager is running in a clustered system, the manager communicates with ETERNUS by using the physical IP address of the clustered system. Therefore the Community setup is described by the same number as the physical IP addresses.

Example

"ssc" is the specified Community name for SNMP communication with the Management Server (IP Address: 10.10.10.10):

```
community ssc 10.10.10.10
```

"ssccom" is the specified Community name for SNMP communication with the Management Server operating as a clustered system operation (physical IP_A: 10.10.10.11, physical IP_B: 10.10.10.12):

```
community ssccom 10.10.10.11  
community ssccom 10.10.10.12
```

2. Trap setting in SNMP Agent Configuration Setting

Since the manager's SNMP Trap receiving module has not judged this Community name, all SNMP Traps sent to the Management Server can be received. Even in an environment where the Community name is specified other than default, it is not necessary to change this community name in trap setting. The Community name of the trap destination is recommended to be set as "public", not same as the Community name of SNMP Community under the consideration of security.

In the ETERNUS Disk Storage system, if the number of the SNMP Trap transmission destination is set to the maximum number of register, no new IP address can be added. Therefore, make sure that the number of SNMP Trap transmission destination is less than the maximum number.

3. Device name setting (SysName) in SNMP (Agent) environment settings

Register a nickname for storage management. This software uses this value as SysName.

4. Network environment settings

If the Management Server resides outside the location indicated by the IP address, subnet mask, gateway, and subnet, the subnet of the Management Server must be registered as the destination network address.

Point

When the Management Server is in a cluster:

If you specify the IP address of the Management Server as a destination network address, specify both physical IP address of each node on the Management Server in a cluster and IP address taken over.

5. Generation of SSH server key (ETERNUS DX80 S2/DX90 S2, ETERNUS DX400 S2 series, ETERNUS DX8000 S2 series only)

Execute the generation of the SSH server key needed for the SSH communication between this software and the devices.
The bit number of the SSH server keys is arbitrary.

6. Creation of Software role account (ETERNUS DX80 S2/DX90 S2, ETERNUS DX400 S2 series, ETERNUS DX8000 S2 series only)

Create an account for this software to manage a device.
Note the following restrictions about the account.

- The root user cannot be used it to manage this software.
- The account should be a software role.
Select Software as the user level when creating the account
- Specify this account information when you register a device in this product.

If you have changed the user name or password on the device side after having registered the account to this software, performing "Reload Conf." for the relevant device causes this product to recognize the password change made on the device side and the device will have a Warning message displayed.

Change the device management account information in the Web Console to make it match with the change in settings made on the device side.

7. SSL Certificate generation or registration (ETERNUS DX80 S2/DX90 S2, ETERNUS DX400 S2 series, ETERNUS DX8000 S2 series only)

This product uses an HTTPS connection to manage the storage devices (default).

In order to be able to use a HTTPS connection with the storage devices, choose one of the following settings:

- Create Self-signed SSL Certificate Setting
- Register SSL Certificate Setting

8. Logoff

Be sure to log off from the ETERNUS Web GUI after completing the setup in the ETERNUS Web GUI.

You must be logged off from the ETERNUS Web GUI in order to perform registration of the device to this product.

9. ETERNUS Web GUI network settings (ETERNUS DX60/DX60 S2/DX80/DX90, ETERNUS DX400 series, ETERNUS DX8000 series, ETERNUS4000 models 400 and 600, ETERNUS8000 models 800, 1200 and 2200 only)

- For the ETERNUS DX60/DX60 S2/DX80/DX90

Under the ETERNUS Web GUI Global Settings tab, click **Setup Network Environment** in the Network Settings and check the settings for the following items:

- Check that "Enable" is specified for Maintenance connections.
- Check that "Disable" is specified for Maintenance-Secure connections.

- For the ETERNUS DX400 series, ETERNUS DX8000 series, ETERNUS4000 models 400 and 600, ETERNUS8000 models 800, 1200 and 2200

Click **Various Settings > Network Environment Configuration (USER Port)** in the main menu for ETERNUSmgr and check the settings for the following items:

- Check that "Enable" is specified for Maintenance Port.
- Check that "Disable" is specified for Maintenance-Secure Port.

 **Information**

For this software, the host access control function of ETERNUS Disk storage system is called "host affinity function", and zone numbers are called "AffinityGroup numbers".

To use this software to set the server node and storage access path (the SAN environment containing the Fibre Channel switch), refer to "[6.2.3.1 Preparations](#)". The following settings must also be configured in the device.

The following settings can be set up from this product, so it is not necessary to perform setup from the device side.

- RAID Settings
- Storage's AffinityGroup/Zone Settings
- Connection Configuration Settings
- Host Interface Settings
- HostWWN Definition
- HostWWN-AffinityGroup/Zone Definition

Date-time settings

To set the date-time for the device, perform the procedure shown below. If the date-time is set during performance monitoring, briefly stop performance monitoring and then restart it.

1. Stop performance monitoring of the device for which date-time is set.
2. Set date-time for the device.
3. After the date-time settings are complete, restart performance monitoring of the device.

Device configuration changing

To change the configuration for the device, the device configuration information kept by performance management must be updated. Update the configuration information according to the procedure in "[7.2.9 Updating configuration information](#)".

4.3.1.2 Problem-handling (FAQ)

Unable to detect ETERNUS DX series, ETERNUS2000, ETERNUS4000, ETERNUS8000

- This software uses SNMP communication to find devices. Therefore, a storage device whose SNMP function is inactive cannot be detected. The storage device's SNMP function must be started.
- This software may be unable to automatically detect the device if SNMP Trap transmissions are set to a specific server but a server which has Manager operating on it is not set as the SNMP Trap transmission destination. Check the settings for the SNMP Trap transmission destination.
- If the SNMP community name is changed and Manager is in the cluster environment, settings on the storage device side may be incorrect. Refer to "[Changing SNMP community name](#)" given below.
- Check that there are no problems with the settings for the storage device and its network environment. This includes network environment settings, access permission settings, transmission mode settings, and so on. Refer to the section "[4.3.1.1 Setting](#)" for network settings. For transmission mode settings, if transmission mode on one side of the connection is "Auto Negotiation" and "FULL (full duplex)" on the other, transmissions may be unable to be sent or slow down, so make sure that the transmission mode is set correctly.

Changing SNMP community name

- The name of the SNMP Community used for SNMP transmission is specified when registering the ETERNUS Disk Storage system or is set in the setting file (sanma.conf). If the SNMP Community settings in the sanma.conf are at their defaults, this software implements SNMP communication using the community name public by default. If "Set SNMP Agent Environment"- "Set Community" is not set at all for ETERNUS Disk Storage system other than ETERNUS DX80 S2/DX90 S2, ETERNUS DX400 S2 series, ETERNUS DX8000 S2 series, "public" (access: readOnly, address: all hosts, view: all objects) has been set as the initial value. If at least one community is set, this software communicates with only the specified community settings. When the SNMP community name for the ETERNUS storage devices is to be changed, storage device settings are required. Refer to "2. Community setting in SNMP (Agent) environment setting" in "[4.3.1.1 Setting](#)".

Timeout occurs in communication

- Check that there are no problems with the settings for transmission mode in the storage device and its network environment. For transmission mode settings, if transmission mode on one side of the connection is "Auto Negotiation" and "FULL (full duplex)" on the other, transmissions may be unable to be sent or slow down, so make sure that the transmission mode is set correctly.

Status displayed by this software differs from the actual status of the device

- When the device is under the maintenance, the status displayed with this software might be different from an actual status of the device.
- If the redundant copy function was running on ETERNUS DX60/DX60 S2, DX80, DX90, the overall status on the ETERNUS Web GUI is "Error", but "Warning" is displayed by this software.

4.4 NetApp FAS Series and V-Series Network Disk Storage system

This software supports fault management and linkage to the Management Software for NetApp FAS Series and V-Series. Embed a device and register its IP address by referring to "[5.2.6 Registering a Manually Embedded Device](#)".

1. Connecting to the network

Make the required settings for the cache server NetApp FAS Series and V-Series to connect to a network, and then connect to the network.

Refer to the manual that comes with the NetApp FAS Series and V-Series unit for details on how to connect to a network.

2. Activating SNMP

The device polling function uses SNMP to acquire the device status of the NetApp FAS Series and V-Series. Enable the SNMP function so that device information can be acquired using SNMP. Refer to the manual that comes with the NetApp FAS Series and V-Series unit for detailed information on making settings.

If the SNMP Community settings in the sanma.conf are at their defaults, this software uses the Community name "public." However, it is also possible to set it to one's own desired Community name. To change the Community name, refer to "[Appendix A Customization](#)".

3. SNMP trap setting

Make the required settings on the NetApp FAS Series and V-Series unit so that SNMP traps of the NetApp FAS Series and V-Series unit will be sent to the Management Server.

If the Management Server is defined as a cluster, the logical IP address of the cluster needs to be set.

4. Management software cooperation

Use the attached management software for device management such as checking the detailed device status of the NetApp FAS Series and V-Series unit and the various settings. The management software can be called directly from the Web Console. As management software, setup the following IP address with the Web Console in advance:

- "http://device IP address/na_admin/"

4.5 VD800 Virtual Disk Controller

This software supports fault management and management software linkage for the VD800 virtual disk controller.

1. Hierarchical control processor settings

Softek Storage Cruiser 1.2.1 (hereafter referred to as SSC) Agent is installed on the hierarchical control processor (server node) contained in the VD800.

To monitor the hierarchical control processor as a server node monitored by this software, make the following settings to register the hierarchical control processor with this software:

- a. Make a setting in /etc/services.

SSC Agent communicates with the Management Server through LAN port number 4917 by default. Therefore, include this port number in the /etc/services file as shown below to declare use of the port number. If no port number is specified, SSC Agent is started with port number 4917.

Example

Contents of /etc/services file setting

```
# service name    port number/protocol name
sscruisera        4917/tcp
```

If the port number is already being used, change the port number to one that is not.

If changing the port number, however, use the one corresponding to the same service name set on the Management Server.

- b. Make a setting in the /etc/hosts file.

Include an IP address that enables communication with the Management Server (manager).

In an environment in which IP addresses are converted (such as NAT), specify an IP address that enables communication from the Management Server, instead of the IP address of a server node.

Example

Example of /etc/hosts file setting:

```
10.10.10.10 spm-0-ext
```

- c. Specify the SSC Agent startup IP address.

Specify an IP address that enables communication with the Management Server (manager).

Specify the IP address defined in the /etc/hosts file of b. as the startup address in the following command:

```
# /opt/FJSVssagt/bin/setagtip -i startup IP address
```

After executing the above command, stop and restart SSC Agent.

Execute the following commands to stop and restart SSC Agent.

Stopping SSC Agent:

```
# /opt/FJSVssagt/bin/pstorageagt
```

Starting SSC Agent:

```
# /opt/FJSVssagt/bin/sstorageagt
```

- d. Search for and register the hierarchical control processor.

Register the hierarchical processor as a server device using the Web Console.

Specify the SSC agent startup IP address as the IP address which is set during this registration.

2. Fibre Channel switch, disk array device, and tape library device contained in the VD800

[Device settings]

Construct and set up the environment for the Fibre Channel switch, disk array device, and tape library device contained in the VD800, as described in this manual.

[Device registration]

Refer to "5.2.1 Device search" for registering the devices.

4.6 ETERNUS VS850 Virtualization Storage

This product supports fault management for VS850. Refer to "[5.2.6 Registering a Manually Embedded Device](#)" and register the device.

1. Network settings

At the VS850, enter the network connection settings to connect to the network. Refer to the manual provided with the VS850 for details.

2. Cluster Name settings

The Management Server uses the Cluster Name set at the VS850 to specify the device. Therefore, the Cluster Name set at the VS850 must be unique amongst all sites, including remote sites. When registering the VS850 at the Management Server, enter the Cluster Name as the device name.

3. SNMP Trap setting

Enter settings at the VS850 side in order to send VS850 SNMP Traps to the Management Server. If the Management Server is in a cluster configuration, the logical IP address of the Management Server cluster must be set.

4. Management software linkage

Use the management software provided for the VS850 to check device status details and to enter settings, including volume virtualization settings. The management software is called directly from the Web Console. As management software, setup the following IP address with the Web Console in advance. `svconsoleip` is the IP address of the server where the management software is executed.

- "`http://svconsoleip:9080/ica`"



- The VS850 is handled as a server node by the Management Server. To perform access path operations, treat the VS850 fibre channel port as a server node HBA port.
- The VS850 is registered at the Management Server as a cluster unit comprised of VS850 nodes. Set the logical IP address of the cluster containing the VS850 nodes as the IP address to be registered at the Management Server.
- If the IP address is not registered during device registration, the device cannot be polled for fault monitoring. Ensure that the IP address is registered.
- If the Cluster Name set at the VS850 and the device name registered at the Management Server are different, fault monitoring using SNMP Traps cannot be performed. Ensure that the device name and the Cluster Name are the same.

4.7 ETERNUS CS800 De-dupe Appliance

This software supports fault management (SNMP Trap monitoring only) for the CS800.

1. Connecting to the network

Perform the setup for connecting the CS800 to the network. Refer to the manual which came with the device for details on how to perform the setup.

2. SNMP Trap setting

Perform the setup of the SNMP Trap transmission destination for the device so that SNMP Traps of the CS800 can be transmitted to the Management Server. If the Management Server is operated in a cluster configuration, set the logical IP address of the cluster as the destination.

3. Registering the device

Refer to "[5.2.6 Registering a Manually Embedded Device](#)" for registering the device. Specify the IP address of the device during the registration operation.

4.8 Tape Library Device

4.8.1 Tape library device ETERNUS LT250/LT270

This software supports all functions except for performance monitoring for ETERNUS LT250 and ETERNUS LT270.

Note that this software does not support automatic device detection function. To detect ETERNUS LT250 or ETERNUS LT270, enter the IP address for the device in a device search.

1. Connecting to the network

Make the required settings for ETERNUS LT250 or ETERNUS LT270 to connect to a network, and then connect to the network. When connecting to the network, start up the SNMP Agent function.

Refer to the manual provided with the ETERNUS LT250 or ETERNUS LT270 for details on the setting method.

2. Community settings in SNMP environment settings

Specify "public" as the Community name (GET).

It is possible to change the Community name. To change the Community name, refer to "[Appendix A Customization](#)".

3. Device name setting (SysName) in SNMP (Agent) environment settings

Register nicknames for managing ETERNUS LT250 or ETERNUS LT270.

This software uses this value as SysName.

4. SNMP Trap setting

Manager does not add the SNMP Trap send destination address to a device.

Set the SNMP Trap send destination address to the IP address for the Management Server on which this software is running, using management software for ETERNUS LT250 or ETERNUS LT270.

For the Management Server in a cluster configuration, the logical IP address of the cluster must be set.

5. Access path setting and display

This software does not set the Fibre Channel Interface for ETERNUS LT250 or ETERNUS LT270, but displays access paths by using SwitchZoning or StorageAffinity on the server node.

When setting the Fibre Channel Interface, use management software for ETERNUS LT250 or ETERNUS LT270.

4.8.2 Tape library device ETERNUS LT20/LT20 S2/LT40/LT40 S2/LT60/LT60 S2/LT200/LT210/LT220/LT230/LT270 S2

This software supports fault management and linkage to the management software, for ETERNUS LT20/LT20 S2/LT40/LT40 S2/LT60/LT60 S2/LT200/LT210/LT220/LT230/LT270 S2.

1. Connecting to the network

Make the required settings for a tape library device which you use to connect to a network, and then connect to the network.

Refer to the manuals provided with the respective devices for details on the setting method.

2. SNMP Trap setting

Set the SNMP Trap send destination address to the IP address for the Management Server on which this software is running, using management software for the tape library server you use.

For the Management Server in a cluster configuration, the logical IP address of the Management Server cluster must be set.

Restart the device after the setting.

3. Management software linkage

Use the management software provided with a tape library device for device management such as checking the detailed status of the tape library device and the various settings.

The management software can be called directly from the Web Console. In advance, setup the following as the management software on the Web Console:

```
http://device IP address/
```

4. Access path setting and display

This software does not set the Fibre Channel Interface, but displays access paths by using SwitchZoning or StorageAffinity on the server node.

When setting the Fibre Channel Interface, use management software for the tape library device.

4.8.3 Virtual Tape Appliance ETERNUS CS2000

This software supports fault management (SNMP Trap monitoring only) for the ETERNUS CS2000.

1. Connecting to the network

Make the required settings for a virtual tape appliance which you use to connect to a network, and then connect to the network. Refer to the manuals provided with the respective devices for details on the setting method.

2. SNMP Trap setting

Make the required settings on the CS console so that SNMP traps of the ETERNUS CS2000 will be sent to the Management Server. If the Management Server is defined as a cluster, the logical IP address of the cluster needs to be set.

3. Registering the device

Refer to "[5.2.6 Registering a Manually Embedded Device](#)" for registering the virtual tape appliance device. IP address of ETERNUS CS2000 must be set in "IP address" for the registration.

Chapter 5 Startup and Setting

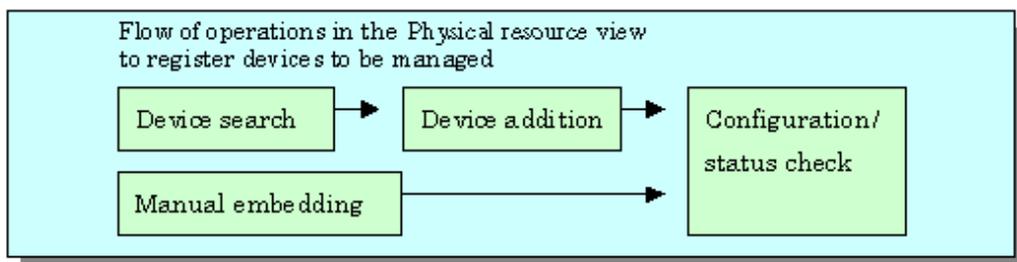
This chapter explains device definitions and operation flowcharts required for operating this software.

5.1 Opening and Closing

The Storage Cruiser function is operated from the Web Console.

Refer to the *ETERNUS SF Web Console Guide* for start up and shutdown.

5.2 Registering device



5.2.1 Device search

For device management using this software, it is necessary to first conduct a device search. There are two methods for conducting a device search.

- [Detecting for devices in the subnet automatically](#)
- [Detecting a device by specifying IP address](#)



Information

- The following devices are added automatically when devices are detected.
 - ETERNUS SF Storage Cruiser's agent, SSC agent
 - The VM host and VM guest on the following environment.
 - VMware Infrastructure 3 Version 3.5 or later
 - VMware vSphere 4 or later
 - VMware ESXi 3.5 or later
- Even when detected a server node (host), the host name may not be resolved. In this case, the host name is displayed in the format of "IP-IP address".
- Even if IPv6 address exists in the searched servers, the agents shown below support only search with IPv4 address.
 - ETERNUS SF Storage Cruiser's agent that does not support IPv6 address
 - SSC agent

Detecting for devices in the subnet automatically

There are the following methods for automatic detection of devices in the subnet.

- Specifying the target subnet in the Web Console screen.
- Specifying the target subnet in the setting file (sanma.conf).

Through detection of the devices within the subnet, the automatic detection-compatible devices supported by Manager are displayed on the screen. SNMP-based broadcasting processes are performed internally and the devices supported by this software are automatically displayed.

Devices with IPv6 address are not searched. If any device registered with IPv6 address exists, this function is not available. When managing any device with IPv6 address, specify its IP address to search it.

Note

- Devices within subnets directly connected with the Management Server are subject to automatic detection regardless of the subnet being specified.
- An environment which has broadcast processing pass through the target subnet is required for SNMP-based broadcast processing to be performed internally.
- Confirm the following if devices within the subnet cannot be automatically detected.
 - For devices that do not support [Detect device in subnet] as described in "[1.2.6 Support levels](#)", use the method described below "[Detecting a device by specifying IP address](#)".
 - When IP address on the Slave CM side is set in ETERNUS Disk storage system, use the method described below "[Detecting a device by specifying IP address](#)". Devices cannot be detected by automatic detection for the devices in the subnet.

Detecting a device by specifying IP address

- To detect ETERNUS SF Storage Cruiser Agent or SSC Agent
Specify the IP address and SNMP Community name for the target device.
- To detect the VM host and VM guest (VMware Infrastructure 3 Version 3.5 or later, VMware vSphere 4 or later, VMware ESXi 3.5 or later)
Specify the IP address for the VM Host. Also, input the username and password used during login to the VM Host.

Information

- By registering a VM host, all of the VM guests on the VM host are automatically registered.
- To detect a VM guest which was set up after device registration for the VM host, use the Web Console to perform device deletion for the VM host which includes this VM guest and then perform the device registration again.

Note

- To register a VM host (and its VM guests) with this software, the IP address, login name and password of the VM host are required.
- It is not possible to specify and register only VM guests.
- To detect any device other than above devices
Specify the IP address and SNMP Community name for the target device

Note

- If such a search for a product in the ETERNUS DX series, ETERNUS2000, ETERNUS4000, ETERNUS8000 fails, check the following items:
 - The SNMP environment has not been set up from ETERNUS Web GUI since installation of the device:
The SNMP agent of the device is not active. Set up the SNMP environment as instructed in "[4.3.1 Disk array ETERNUS DX series, ETERNUS2000, ETERNUS4000, ETERNUS8000](#)".
 - In the case of ETERNUS DX60/DX60 S2, DX80/DX80 S2, DX90/DX90 S2, DX400 S2 series, DX8000 S2 series
For the device detection, specify the IP address on the Master CM side. If the IP address on the CM slave side was specified for detection or registration, access path settings are not possible.
- If such a search for ETERNUS SF Storage Cruiser's agent or SSC agent fails, check whether ETERNUS SF Storage Cruiser's agent or SSC agent is activated. If not, activate ETERNUS SF Storage Cruiser's agent or SSC agent.
- On an AIX agent installed server, the following problems may occur:
 - It takes lots of time to register a server.
 - It takes lots of time to reload configuration.
 - The HBA port information for a target server may not be properly recognized.

If any of those mentioned above is seen, check all the HBA ports for proper connection. If there is any fibre channel device corresponding to an HBA port that is not connected, delete it if possible. To check HBA port-fibre channel device correspondence, refer to the AIX document. In addition, if the server is restarted, this operation may be needed again.

[Example of deleting unused fibre channel device fcs3]

```
# /usr/sbin/rmdev -Rdl fcs3
```

If a problem does not fall under those mentioned above, refer to "[B.1 Troubleshooting information](#)" to collect analysis material and contact a Fujitsu system engineer.

5.2.2 Registering a Device

To make this product's managed device, it is necessary to register a device which has already been detected using the Web Console.

- User name and password

To manage the device, this software must recognize the user name and password associated with the device.

Since each device requires different information, the items displayed in the dialog change accordingly.

<Required information>

- For SN200 (Brocade) fibre channel switch, PRIMERGY Fibre Channel switch blade, Brocade VDX series and PRIMERGY BX Ethernet Fabric Switch a user name and password with administrator rights will be required.
 - For SN200MDS (Cisco MDS) Fibre Channel switch, there is no required information.
 - For the ETERNUS DX80 S2/DX90 S2, ETERNUS DX400 S2 series, ETERNUS DX8000 S2 series, user name and password of Software roll will be required. For the ETERNUS Disk Storage system other than stated above, a user name and password with administrator rights will be required.
- Check box of "Enable fault monitoring via SNMP traps on this device"

When a device is added, this software automatically sets the SNMP Trap transmission place address for the device so that it can monitor for faults by using the SNMP Trap. Refer to "[1.2.6 Support levels](#)" for information about the device types for which the address automatic setting function can be used.

Information

- Refer to "5.2.4 Function for setting event notification destinations" for information about fault monitoring required for an added device after the function is disabled. Refer to "5.2.5 SNMP Trap transmission place automatic setting function" for a detailed explanation of the automatic setup.
- The check box of "Enable fault monitoring via SNMP traps on this device" is invalid for the device which does not support the function of automatically setting SNMP Trap transmission place.

- Checkbox for enabling the zoning setting

When a fibre channel switch device is registered, this software sets up the device such that zoning setup can be done. Select this option if performing setup of the access path from this software. If you do not select this option, operations will start as is (i.e. with no security) for the fibre channel switch device which had no zoning setup performed (meaning this switch is in a No Security status).

Note

- If a device to be managed cannot be accessed, or if it is in any of the states described below, it cannot be registered.
 - Fibre Channel switch (Excluding Brocade VDX series and PRIMERGY BX Ethernet Fabric Switch)
 - Telnet was used to login to the target device.
Action: Log out, and then perform the registration process.
 - Brocade VDX series, PRIMERGY BX Ethernet Fabric Switch
 - SSH was used to login to the target device.
Action: Log out, and then perform the registration process.
 - ETERNUS DX series, ETERNUS2000, ETERNUS4000, ETERNUS8000
 - User is logged into the target device's ETERNUS Web GUI.
Action: Log out, and then perform the registration process.
- During the device registration process, if telnet is used to login to the Fibre Channel switch connected to the device to be registered, the physical line between the Fibre Channel switch and the device cannot be displayed because information cannot be obtained from the Fibre Channel switch. In this event, log out and execute the device registration process.
- During the device registration process, if Brocade VDX series and PRIMERGY BX Ethernet Fabric Switch have already been manually registered, be sure to delete the manually registered devices first and then perform registration. If registration is performed when manually registered devices remain registered, no information can be obtained from the Fibre Channel switch. In this case, delete target manually registered devices.

5.2.3 Deletion

This function cancels the registration of a device being managed by this software, thereby deleting that device from the range of management. It is used in such cases as when a device has been removed.

Information

Individual VM guests for VMware Infrastructure 3 Version 3.5 (or later), VMware vSphere 4 (or later) or VMware ESXi 3.5 (or later) can be deleted from the management target for this product by first deleting the VM guest using VMware management software and then deleting the VM guest using this procedure. If the VM guest is still on the VM host it will be registered again automatically.

Note

- You cannot delete a server which has volume definition(s) of Backup management of AdvancedCopy Manager or Replication Group definition(s) of Replication management of AdvancedCopy Manager. You should delete the volume definition(s) of Backup management of AdvancedCopy Manager or Replication Group definition(s) of Replication management of AdvancedCopy Manager before the server deletion.
- To delete a VM host (VMware Infrastructure 3 Version 3.5 or later, VMware vSphere 4 or later, or VMware ESXi 3.5 or later) from this product, delete all VM guests on the VM host to be deleted in advance.
- In this product, even if a SNMP Trap send destination address is not automatically set, when deleting a target device, if the IP address of the Management Server is set to the SNMP Trap send destination address of the device, its setting is deleted.

Execute the deletion of the device from the Web Console. The disk storage system's copy sessions are not deleted.

If the deleted device has been detected again by this software's automatic device detection it will be re-displayed.

It is also possible to delete only the access path existing between the Managed Server and the device that is the target for deletion.

Note

When you delete a server, delete all the access paths connected the server in advance, and then execute the deletion of the server.

5.2.4 Function for setting event notification destinations

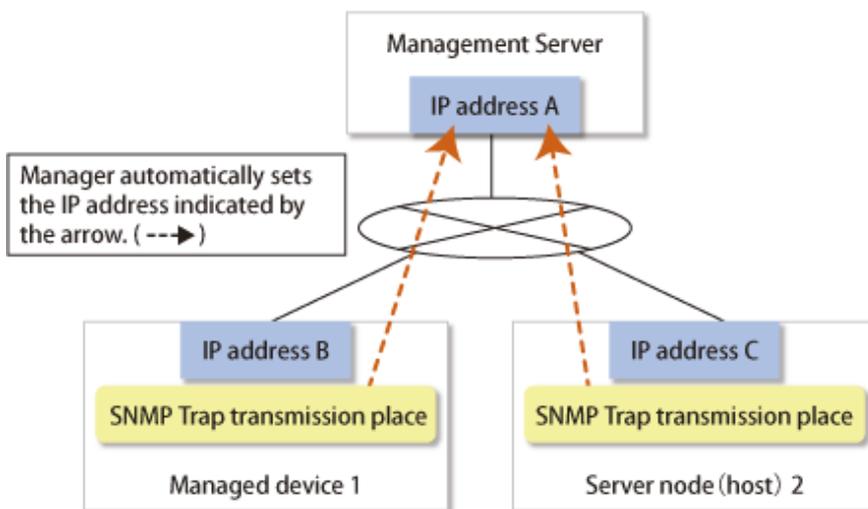
If fault monitoring is required for a device after the SNMP Trap transmission place address automatic setting function is disabled for the device during the device addition process, it is possible to perform setup from the Web Console.

5.2.5 SNMP Trap transmission place automatic setting function

The SNMP Trap transmission place automatic setting function, which is executed at the time of a device search or device addition, and its accuracy are explained with the figures below.

Management Server with only one IP address

This software automatically identifies IP address A of the Management Server and sets "IP address A" as the SNMP Trap transmission place for each managed device.

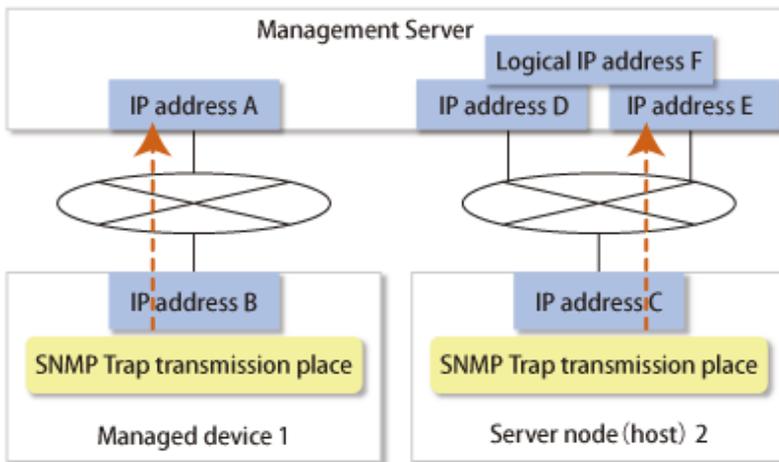


Management Server with two or more IP addresses

Such Management Server has a cluster or redundant LAN configuration or is connected to multiple subnets, and it has two or more IP addresses.

From the multiple IP addresses of the Management Server, this software selects the one that is most suitable as the transmission IP address for each device. However, this logic does not work in all cases. In the environment shown in the figure below, for example, this software may set "IP address D" as the SNMP Trap transmission place for Managed device 1. This is because addresses cannot be automatically detected in some cases due to the nature of current LAN technology. In such an environment, therefore, it is necessary to check the SNMP Trap transmission place setting of each device after the device addition process and, if required, set SNMP Trap transmission places directly on the device side.

In the figure below, specify "IP address A" as the SNMP Trap transmission place for Managed device 1, and "Logical IP address F" as the SNMP Trap transmission place for Server node 2. Refer to "2.1 Receiving SNMP Traps" for information about how to set SNMP Trap transmission place addresses of server nodes manually.



Point

In order for the server node to send the SNMP Trap, agent must be installed on the host.

5.2.6 Registering a Manually Embedded Device

Some devices (such as Managed Servers without an agent, tape units, and NAS devices) cannot be retrieved by device search. Register these devices with this software by using the manual embedding function.

5.3 Checking Management Status

Check whether the setup is correct. Use the following steps to check the setup:

[Test 1] Check whether every device (excluding the server node agent) can correctly receive SNMP Traps

This software receives generic traps 0 to 5, which are SNMP Traps not unique to a specific vendor, and it decodes their contents and displays information about each event (that does not use Systemwalker Centric Manager linkage or Shell/bat linkage.) As one of generic traps 0 to 5, a COLD START trap is issued by an ordinary device. When using this trap to test whether the software can correctly receive an SNMP trap.

A device sends the COLD START trap and other traps by turning OFF and ON the device to be managed, performing a variety of setup tasks (setup of the SNMP environment for ETERNUS), doing other such work. Check whether the event is displayed with regard to the above operation and trap.

However, generic traps 0 to 5 are not normally required, so after the test is completed, you can disable display of generic traps 0 to 5 by using the following method:

Edit the following definition file:

Platform of Manager	File location
Windows	\$ENV_DIR\Manager\etc\opt\FJSVssmgr\current\sanma.conf (\$ENV_DIR means "Environment Directory" specified at the Manager installation.)
Solaris OS, Linux	/etc/opt/FJSVssmgr/current/sanma.conf

Edit one description as follows (0=Hide, 1=Show): `DISPLAY_SNMP_STANDARD_EVENT = 0;`

Using the Web Console, execute re-read definition file and import the definition files into the program.

[Test 2] Check whether server node (agent) can correctly receive SNMP Traps

The server node (Agent) provides the following command that issue SNMP Trap for the test.

Platform of Agent	Command location
Windows	\$INS_DIR\Agent\bin\traptest [<i>ip-address</i>] (\$INS_DIR means "Program Directory" specified at the Agent installation.)
Solaris OS, Linux, HP-UX, AIX	/opt/FJSVssage/bin/traptest [<i>ip-address</i>]

Only in the environment where the host holds two or more IP addresses, a server node's IP (Agent start IP address) address which the manager recognizes is specified to ip-address.

Make sure the IP address input is correct, if the event cannot be received correctly.

If the device was set up normally, an event will be issued to the Web Console when this command is executed.

SNMP Trap test command cannot linkage to Shell/bat. Modify the SNMP definition if necessary.

To modify SNMP Trap definition, modify ESC agent SNMP trap definition file which is located 1_3_6_1_4_1_211_4_1_3_21_2_2.xml. SNMP trap test is defined as the first number of "Specific Trap Type". You may change the action for this trap. Refer to "A.6 SNMP Trap XML Definition File" for SNMP Trap definition file.

 Information

- For the following environment, the fault monitoring function by receiving SNMP Traps is not supported. Therefore, it is no necessary to execute this test.
 - VMware Infrastructure 3 Version 3.5 or later
 - VMware vSphere 4 or later
 - VMware ESXi 3.5 or later
- The community name of a test SNMP trap is fixed to "public".

[Test 3] Check Systemwalker Centric Manager linkage and Shell/bat linkage of events.

Events cannot be linked with Systemwalker Centric Manager or Shell/bat for the standard SNMP Trap. To test the Systemwalker Centric Manager linkage and Shell/bat linkage of an SNMP Trap from a device, execute a tentative SNMP Trap command for the test on the Management Server. This command changes internal information of an SNMP Trap so that the SNMP Trap seems to have been sent from a device being monitored, and it sends such an SNMP Trap to the system's own port for receiving the SNMP Trap. Since descriptions of events are linked to Systemwalker Centric Manager and Shell/bat, Systemwalker Centric Manager linkage and Shell/bat linkage can be tested. To test the Shell/bat linkage of an SNMP Trap of the server node agent, use the method described in [Test 2].

For the IP address of an argument, specify the IP address of a device (ETERNUS Disk storage systems or Fibre Channel switch) registered with this software. The contents of this simulated SNMP Trap are loaded into the event log.

The commands shown below are executed to generate a simulated SNMP Trap for the ETERNUS DX series, ETERNUS2000, ETERNUS4000, ETERNUS8000 device registered with this software. Using these commands, the manager creates the simulated trap, receives the same trap, and checks whether the displayed event and shell/bat linkage are correct. Here, the simulated trap is a fan fault with "public" as the Community name. This simulated trap has arbitrary test information that is distinct from actual trap information. Also, the ETERNUS Disk storage systems can issue an SNMP trap from the device by using the "SNMP trap sending test" function of ETERNUS Web GUI. Though the test uses a simulated trap, its results are the same as those from a test that sends a real trap and checks the response, since the trap is sent from an actual ETERNUS Disk storage systems.

Platform of Manager	Command location
Windows	\$INS_DIR\Manager\opt\FJSVssmgr\bin\grtraptest <i>ip-address</i> (<i>\$INS_DIR</i> means "Program Directory" specified at the Manager installation.)
Solaris OS, Linux	/opt/FJSVssmgr/bin/grtraptest <i>ip-address</i>

The commands shown below are executed to generate a simulated SNMP Trap for a Fibre Channel switch registered with this software. (A simulated error that is a port fault is issued.):

Platform of Manager	Command location
Windows	\$INS_DIR\Manager\opt\FJSVssmgr\bin\swtraptest <i>ip-address</i> (<i>\$INS_DIR</i> means "Program Directory" specified at the Manager installation.)
Solaris OS, Linux	/opt/FJSVssmgr/bin/swtraptest <i>ip-address</i>

Chapter 6 Operation

Configuration management is made by using the Web Console. This chapter explains how to use window.

6.1 Resource Management

For the device registered to this product, it is possible to use various functions via the Web Console.

6.1.1 RAID Group Management

With this product, it is possible to manage the storage device's RAID Groups. It is possible to operate with the same operability without being aware of restrictions according to type of storage device and model.

The target device is selected with the Web Console, and processing is selected from the action pane.

The executable operations are as follows:

- Display RAID Group Status
- Create/Delete RAID Group
- RAID Group Eco-Mode Settings

6.1.2 Volume Management

With this product, it is possible to manage the storage device's volume. It is possible to operate with the same operability without being aware of restrictions according to type of storage device and model.

The target device is selected with the Web Console, and processing is selected from the action pane.

The executable operations are as follows.

- Create/Delete Volume
- Format Volume
- Expand Thin Provisioning Volume Capacity
- Delete Snap Data Pool Volume
- Encrypt Volume
- Equalize Thin Provisioning Volume

6.1.3 Thin Provisioning Management

With this product, it is possible to manage the storage device's Thin Provisioning. It is possible to operate with the same operability without being aware of restrictions according to type of storage device and model.

The target device is selected with the Web Console, and processing is selected from the action pane.

The executable operations are as follows.

- Display the Thin Provisioning Pool
- Display the Thin Provisioning Pool status
- Change the Thin Provisioning Pool threshold value
- Create/Delete the Thin Provisioning Pool
- Display the Thin Provisioning Pool Capacity graph
- Expand the Thin Provisioning Pool Capacity
- Format the Thin Provisioning Pool

6.1.4 Advanced Copy Management

With this product, it is possible to manage the storage device's Advanced Copy. It is possible to operate with the same operability without being aware of restrictions according to type of storage device and model.

The target device is selected with the Web Console, and processing is selected from the action pane.

The executable operations are as follows.

- Display Advanced Copy
- Set Up Copy Parameters
- Set Up REC path
- Acquire REC path information
- Collect REC Device Information
- Measure REC Response Delay Time
- Set Up REC Multiplicity
- Set Up REC Buffer

6.1.5 Connectivity Management

With this product, it is possible to manage the storage device's connectivity. It is possible to operate with the same operability without being aware of restrictions according to type of storage device and model.

The target device is selected with the Web Console, and processing is selected from the action pane.

The executable operations are as follows:

- Display Connectivity Status (Set Up Host, Set Up Port, Host Response, Reset Group)
- Create/Delete Host Affinity
- Set Up FC Host/iSCSI Host/SAS Host
- Set Up FC Port/iSCSI Port/SAS Port
- Set Up Affinity Group
- Set Up Host Response
- LUN Mapping (direct connection) display

Note

- The iSCSI-RA port Transfer Rate cannot be changed in the Web Console.
If it needs to be changed, use the ETERNUS Web GUI.
- Setting the IP address, link local IP address, connection IP address, iSCSI name, or iSCSI alias name of an iSCSI port the same as another iSCSI port may not be allowed.

Refer to the following table for information on the duplicate registration:

Storage model name	Duplicate registration				
	IP address	Link local IP address	Connection IP address	iSCSI name (*1)	iSCSI alias name
ETERNUS DX80 S2/DX90 S2 ETERNUS DX400 S2 series ETERNUS DX8000 S2 series	N/A	N/A	N/A	N/A	N/A
ETERNUS DX60/DX60 S2/DX80/ DX90 ETERNUS DX400 series	N/A	-	-	N/A	N/A

Storage model name	Duplicate registration				
	IP address	Link local IP address	Connection IP address	iSCSI name (*1)	iSCSI alias name
ETERNUS DX8000 series ETERNUS4000 models 400 and 600 ETERNUS8000 models 800, 1200 and 2200					
ETERNUS2000 models 50, 100 and 200 ETERNUS4000 models 300 and 500 ETERNUS8000 models 700, 900, 1100 and 2100	N/A	-	-	N/A	A

"A" indicates "Available", and "N/A" indicates "Not Available".

*1: If the default iSCSI name has been set, it is able to be registered by duplicating.

- Setting the IP address, iSCSI name, iSCSI alias name, and iSCSI host name of an iSCSI host the same as another iSCSI host may not be allowed.

Refer to the following table for information on the duplicate registration:

Storage model name	Duplicate registration			
	IP address	iSCSI name	iSCSI alias name	iSCSI host name
ETERNUS DX80 S2/DX90 S2 ETERNUS DX400 S2 series ETERNUS DX8000 S2 series	A (*1)	A (*1)	N/A	N/A
ETERNUS DX60/DX60 S2/DX80/DX90 ETERNUS DX400 series ETERNUS DX8000 series ETERNUS4000 models 400 and 600 ETERNUS8000 models 800, 1200 and 2200	N/A	A	N/A	N/A
ETERNUS2000 models 50, 100 and 200 ETERNUS4000 models 300 and 500 ETERNUS8000 models 700, 900, 1100 and 2100	N/A	N/A	A	-

"A" indicates "Available", and "N/A" indicates "Not Available".

*1: If both the IP address and the iSCSI name are duplicated, it is not available. If one either is not duplicated, it is available.

6.1.6 How to control the Eco-mode

This software can use the Eco-mode that controls the ON/OFF status for the disk drive spindle rotation for storage devices. While the RAIDGroup that is being used from the server is being verified, the disk drive spindle rotation ON/OFF status for the RAIDGroup can be controlled.

There are two Eco-modes: the "storage device Eco-mode" and the "RAIDGroup Eco-mode". The ON/OFF status can be set for each.

When the storage device Eco-mode is set to ON, the RAIDGroup Eco-mode can be set to ON/OFF.

When the RAIDGroup Eco-mode is set to ON and its schedule is set to "External", the spindle rotation of the disk drive that is used to configure the RAIDGroup can control the ON/OFF status. However, the Eco-mode operation for the "[Uncontrollable RAID groups](#)" cannot be done.

For the Eco-mode operation, the target device is selected with the Web Console and the operation is executed.

The executable operations are as follows.

- Setting the device's Eco-mode to ON
- Setting the device's Eco-mode to OFF
- Setting the RAID Group's Eco-mode to ON
- Setting the RAID Group's Eco-mode to OFF
- Starting up the disk drive for which the RAID Group is configured
- Stopping the disk drive for which the RAID Group is configured

6.1.7 End to End list display

For the End to End list display, correlating information from the storage to the server is displayed. Using the Web Console, select [Correlation].

Note

- Only volumes that are connected by host affinity function are displayed at End to End list display.
- The [Mount Point] or the [Multipath Driver Device] is displayed only when you selected the [End to End View]. VMware and Hyper-V are not supported.
- When the Managed Server node OS is Windows or the installed Storage Cruiser's agent is version 15.0, a hyphen ("-") is displayed at the [Mount Point] and the [Multipath Driver Device].
- When the corresponding Multipath driver is not installed, a hyphen ("-") is displayed at the [Mount Point].

See

Refer to "[3.2 Server node middleware for which management is possible](#)" for the details on the corresponding Multipath drivers and file systems.

For VMware

To display the End to End list for VMware's VM guest and the storage device, register the VM host to the Management Server. It is also necessary to register to this software the VMware vCenter Server which manages the VM host registered to the Management Server.

Specify the following for registration of the VMware vCenter Server.

- IP address
- User name
- Password
- Communication port number of VMware vCenter Server (Default: 443)

Note

- The End to End list for VMware supports the display of information for storage devices connected to the VM host with FC, iSCSI and FCoE connections. Storage devices utilizing SAS connections, NPIV connections in an FC environment, and storage devices with the VM guests directly connected with iSCSI are not supported.

- When registering the VM host to the VMware vCenter Server using the host name, set it so that name lookup can be done on the Management Server for the VM host being registered to this product. Perform one of the following setups.
 - Register the IP address and host name for the VM host being set to the VMware vCenter Server to the DNS server which the Management Server references.
 - Define the IP address and host name for the VM host set to the VMware vCenter Server to the /etc/hosts file on the Management Server.

For Hyper-V (Windows, only for manager)

To display the End to End list for the VM guest on the Hyper-V host, install the agent to the Hyper-V host and then register it to the Management Server.

Next, register the target Hyper-V host in the End to End View (Hyper-V).

Specify the following for registration of the Hyper-V host.

- User name
 - When Hyper-V host is participating in the ActiveDirectory environment:
Specify users with administrator privileges in the format of "Domain name\User name".
 - When Hyper-V host is not participating in the ActiveDirectory environment:
Specify users with administrator privileges in the format of "NetBIOS computer name\User name".

If the user name is not specified in the formats listed above, incorrect information may be displayed.

- Password

Also, implement the following settings to the Hyper-V host and the Management Server.

To make settings, users must have administrator privileges to log in.

- Set up Hyper-V host

Perform the following procedure to give permission for Hyper-V host that is performing End to End display to remote management.

1. Click [start] - [Administrative Tools] - [Server Manager] to run Server Manager. Click [Configure Server Manager Remote Management] in [Computer Information] on Server Manager.
If [Enable remote management of this server from other computers] checkbox is unchecked, check it and click [OK].
2. Click [start] - [run]. Enter "cmd.exe", and click [OK].
Execute the following command at the command prompt.

```
C:\Users\administrator> winrm quickconfig [Enter]
```

If the remote management is not set, enter "y".

For the End to End list display for Hyper-V with iSCSI connection, set up the advanced settings for the connection when connecting to a target detected from iSCSI initiator property. Specify the IP address for the Hyper-V host adopter to the initiator IP in the advanced settings. If the settings are incorrect, the End to End list for Hyper-V is not displayed properly.

- Set up the Management Server

Click [start]-[run]. Enter "cmd.exe", and click [OK].

Execute the winrm command below on the console of cmd, and check the value for TrustedHosts.

Execution example)

```
C:\Users\administrator> winrm get winrm/config/client
```

Specify "*" for TrustedHosts or, only if the IP address for the Hyper-V host for which the End to End list is to be displayed has not been set, execute the winrm command below to specify the value for TrustedHosts.

Execution example)

```
C:\Users\administrator> winrm set winrm/config/client @{TrustedHosts="ipAddr" } [Enter]
```

For *ipAddr*, specify as the value for the previously confirmed TrustedHosts and the IP address for the Hyper-V host for which the End to End list of the VM guests is to be displayed. If you specify multiple IP addresses, specify them with the addresses separated by commas (as in "*ipAddr1, ipAddr2,...*"). For IPv6 format, surround the IP address with brackets "[]".

Example: When registering 192.168.1.10,fcde:555:444:333:222::1027,fcde:555:444:333:222::1154 in Trusted Hosts:

```
TrustedHosts="192.168.1.10, [fcde:555:444:333:222::1027], [fcde:555:444:333:222::1154]"
```



Note

- To use this function, the following need to be installed on the Management Server:
 - .NET Framework 2.0 or later
 - PowerShell 2.0 or later
 - WinRM2.0 or later

Note that the supported version of Hyper-V is 2.0.

- The End to End list for Hyper-V supports the display of information for storage devices connected to the VM host with FC, iSCSI and FCoE connections. Storage devices utilizing SAS connections and storage devices with VM guests directly connected with iSCSI are not supported.
- For a multipath configuration, the End to End list for Hyper-V displays only one path. A host name detected by the agent may not be consistent with a host name of the Hyper-V host displayed in the End to End list for Hyper-V. To be consistent with those host names, define the host name as a computer name in the /etc/hosts file of Hyper-V host.
- The information of virtual HBA on the Hyper-V guest is not displayed.
- If the same format (IPv4 or IPv6) IP address as the Hyper-V host is not set to its VM guests, the IP addresses of the VM guests are not displayed.

6.2 Access Path Management

6.2.1 What is an access path?

In this software, the logical paths of server node and storage devices are defined as access paths.

Access paths are generated by the following access control functions of the server node, Fibre Channel switch, and storage.

Fibre Channel switch zoning

Switch vendors provide Fibre Channel switch zoning. Information such as the WWN/port number used by Fibre Channel for the host bus adapter (HBA) on the server node side and the WWN/port number of channel adapters (CAs) on the storage side is combined in a zone unit, and access from ports other than the port defined for the zone are restricted.

Storage host affinity

Storage vendors provide storage host affinity. The storage side recognizes the WWPN of the HBA on the server node side in order to restrict access. Associations of WWPNs of HBAs with storage areas (AffinityGroup/Zone) can also be set.

ETERNUS DX series, ETERNUS2000, ETERNUS4000 and ETERNUS8000 refer to storage host affinity as "Set Affinity Group", "Set Host-Affinity Group".

Integrated access path control

This software integrates and manages these functions to facilitate definition of settings that make use of the characteristics of SAN security and each function.

It controls access paths according to the functions and settings of individual devices.

6.2.2 Access path display (display of the logical relationship between a server node and storage systems)

This software gathers information from each device and displays the status of access paths or the status of logical access paths from the server node. This function is effective for verifying the validity of system configuration setup and recognizing the effect of a resource error because it enables the logical relationship in the more complicated SAN environment to be easily determined.

If the server node operates under a Solaris OS environment and the storage system is a library or tape device, the tape-type drivers for which access paths can be displayed are as follows:

st, flta, fsct, IBMtape, mt, lb, sg, sgen

Note

The Solaris OS server node uses special file /dev/rdisk/cXtX, /dev/rmt to obtain WWPN binding information. For this reason, to recognize WWPN binding, this special file (device file) must be created in advance. If any unused special file is in /dev/rdisk/, /dev/rmt, it causes the access path display to be incorrect. If access path display by this software differs from that by system equipment, clarify the special files defined in the following operations:

- Solaris OS (For the environment which uses hard disk driver (HDDV), and does not use multipath control (ETERNUS Multipath Driver, MPLB, MPHD))

```
# touch /reconfigure
# /usr/sbin/shutdown -y -i6 -g0 (server node restart processing)
```

After the server node has been restarted

```
# format (Loading processing to HDDV driver's kernel)
# disks -C
```

- Solaris OS (For the environment which uses both hard disk driver (HDDV) and multipath control (ETERNUS Multipath Driver, MPLB, MPHD), uses only multipath control or uses neither.)

```
# touch /reconfigure
# /usr/sbin/shutdown -y -i6 -g0 (server node restart processing)
```

After the server node has been restarted

```
# disks -C
```

6.2.2.1 Access path status display

You can check the access path status connected by the Fibre Channel on the [status] column on the [Access Path] screen.

The status of access paths are displayed as the following icons. When you click the each status, the corresponding error content message is displayed.

In addition, if you check the access path status, click the [Refresh] button in the access path status to make the status up-to-date.

Access path status	Description	Action
 Normal	<p>The access path is normal.</p>	<p>None.</p> <p>However, for HBA shown below, you must take actions for making the operating system recognize LUN.</p> <ul style="list-style-type: none"> - If the HBA is XSEFC401AF, XSEFC402AF, SG-XPCIE2FC-EM4, or SG-XPCIE2FC-EM8: <ol style="list-style-type: none"> 1. In an environment connected to a Fibre Channel switch, configure the HBA N port settings. Refer to "4.1.1.2 N-port settings", and check the N-port settings. If the settings are incorrect, correct them. 2. Check the storage Ap_id by executing <code>cfgadm -al</code> command, and make the OS recognize the LUN by executing <code>cfgadm-c configure Ap_id</code> command. For details about the commands, check the man command. - If the HBA is SE0X7F21F, SE0X7F22F, SG-XPCI1FCQF2, SG-XPCI2FC-QF2 SGXPCI1FC-QL2, SG-XPCI2FCQF2-Z, SG-XPCI1FC-QF4, or SGXPCIE2FC-QF8: Check the storage Ap_id by executing <code>cfgadm -al</code> command, and make the OS recognize the LUN by executing <code>cfgadm-c configure Ap_id</code> command. For details about the commands, check the man command.
 Warning	<p>The following possibilities are considered.</p> <ul style="list-style-type: none"> - The access path definition is inconsistent. - The Fibre Channel switch is not registered. 	<ul style="list-style-type: none"> - When the access path definition is inconsistent: Click [status] to display the error content message. Refer to "Error messages of access path" in the <i>ETERNUS SF Messages</i>, take actions according to the instructions for the error message. - When the Fibre Channel switch is not registered: Register the Fibre Channel switch.
 Error	<p>The following possibilities are considered.</p> <ul style="list-style-type: none"> - The access path is disconnected due to an error (if the multipath control mechanism is installed). - Another part failure caused an access path error. This state also occurs if a device in the access path is faulty. - The Fibre Channel cable on a route is disconnected. - The access path is set "Offline" by the user. - HBA was reduced or replaced. 	<p>Click [status] to display the error content message. Refer to "Error messages of access path" in the <i>ETERNUS SF Messages</i>, take actions according to the instructions for the error message.</p> <p>In addition, if a part failure is suspected, click [Reload Conf.]:</p> <p>Reload the configuration to the device defined as an access path for identify whether a failure occurs or not.</p> <p>Replace the faulty part, and execute recovery processing.</p> <p>When the access path is set to "Offline", set it to "Online" as necessary.</p> <p>If HBA was reduced, delete the access path on the [Access Path] screen. Refer to "Delete the access path" in the <i>ETERNUS SF Web Console Guide</i> for details on how to delete.</p> <p>If HBA was replaced, it is required to take corrective action that corresponds to the HBA status displayed on the [Server Detail] screen. Execute [Reload Conf.] as to the replaced HBA-installed device to perform the following steps:</p> <ul style="list-style-type: none"> - If the HBA status is "Changed": Perform access path modification operation. Refer to "8.3.1.2.1 Post-replaced HBA state is "Changed"" for details on the inheritance operation. - If the HBA status is "Unknown": Perform access path modification operation. Refer to "8.3.1.2.2

Access path status	Description	Action
		Post-replaced HBA state is "Unknown" for details on the modification operation.
 Unknown	<p>The following possibilities are considered.</p> <ul style="list-style-type: none"> - The access path status needs to be updated. - Access path settings are incorrect. - HBA has been replaced. 	<p>Click the [Refresh] button in the access path status to make the status up-to-date. In the following configuration, display "Unknown" because the access path status cannot be obtained.</p> <ul style="list-style-type: none"> - The server is not registered on the Management Server. - The server is not installed Storage Cruiser's agent (a manually incorporated server). <p>For displaying the access path status, install Storage Cruiser's agent and register the server on the Management Server.</p> <p>If HBA was replaced, it is required to take corrective action that corresponds to the HBA status displayed on the [Server Detail] screen. Execute [Reload Conf.] as to the replaced HBA-installed device to perform the following steps:</p> <ul style="list-style-type: none"> - If the HBA status is "Changed": Perform access path modification operation. Refer to "8.3.1.2.1 Post-replaced HBA state is "Changed"" for details on the inheritance operation. - If the HBA status is "Unknown": Perform access path modification operation. Refer to "8.3.1.2.2 Post-replaced HBA state is "Unknown"" for details on the modification operation.
(-)hyphen	Access path cannot be displayed because the interface is iSCSI.	None.

Note

- The access path status is not updated automatically. When you check the access path status, click the [Refresh] button in the access path status to make the status up-to-date.
- In an environment not connected to a Fibre Channel switch, the access path status is not displayed correctly.
- It may take a few minutes to update the access path status. You can confirm the completion of the processing on the [Operation History] screen.

6.2.3 Access path setting

In a storage system where a Fibre Channel switch is between a server node and storage, this software automatically changes the security settings supported by each device and sets an access path, as shown in the figure below. If no security mechanism is provided on the device side, setting up security may not be possible. However, the security mechanisms of other devices create access paths. If none of the devices constituting these access paths is equipped with a security function, security cannot be set up but the access paths can be accessed from the server node.

Point

You can set the access path concurrently with assigning volumes to the server using the Web Console. Refer to "Assign ETERNUS Disk storage system volumes to a server" in the *ETERNUS SF Web Console Guide* for details on the operation.

 Note

Each storage system has requirements, such as HBA types used, for guaranteeing operation according to the mutual connection verification status. Set each access path so that these requirements are satisfied. For more information about the requirements, contact the respective storage system distributor.

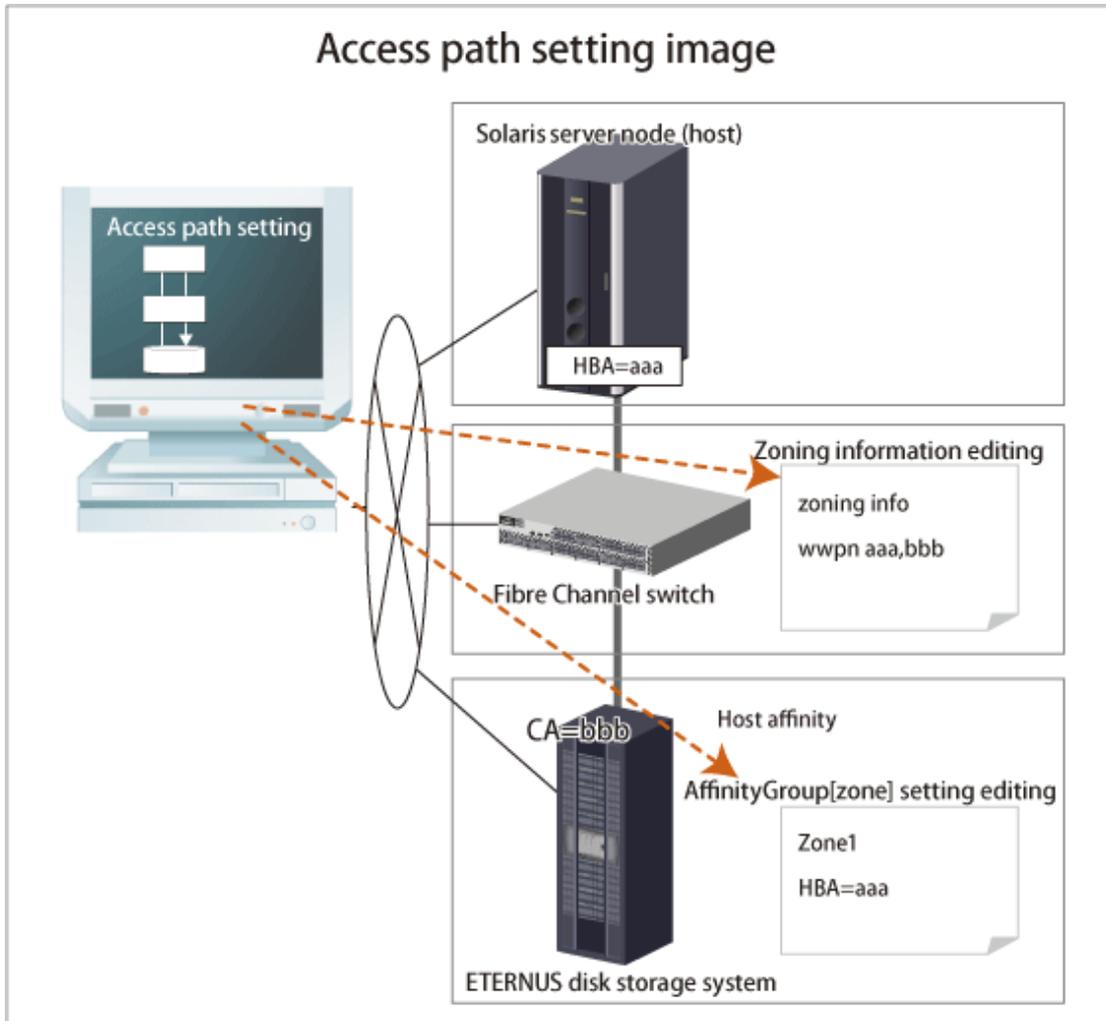


Table 6.1 Security information that this software sets in a device when setting an access path

Device type		Contents set by this software
Solaris server node	Agent available/unavailable	No setting
Windows server node	Agent available/unavailable	No setting
Linux server node	Agent available/unavailable	No setting
HP-UX server node	Agent available/unavailable	No setting
AIX server node	Agent available/unavailable	No setting
Other server nodes	Agent unavailable	No setting
Fibre Channel switch	With zoning setting	WWPN one-to-one zoning is set. (However, this zoning is not set if the Fibre Channel switch side already has sufficient port zoning.)
	Without zoning setting	No setting

Device type		Contents set by this software
ETERNUS DX series, ETERNUS2000, ETERNUS4000, ETERNUS8000	With security setting	Setting of HBA WWPN for security
	Host affinity (zone) setting	Setting of HBA WWPN to the affinity group (zone)
	Without security setting	No setting
Other storage/tapes		No setting

6.2.3.1 Preparations

Notes

- Only "System Administrator" account can set access paths.
- To change the specified AffinityGroup/zone name on the ETERNUS Disk storage system side of a set access path, delete the path and then set it again with a new zone.
- Verify that all Fibre Channel switches cascaded to the Fibre Channel switch associated with the access path setting are correctly recognized in the current status. Once an access path is changed because a Fibre Channel switch is temporarily disconnected from the cascade connection, the old cascade connection cannot easily be recovered. (In this event, execute the `cfgClear` command to delete zoning information for the Fibre Channel temporarily disconnected from the cascade connection. This enables cascade reconnection.)
- When setting an access path that is configured in the FC routing functionality LSAN zone in this software, manually set the LSAN zone in the device in advance.

Checking storage settings

Check the following settings on the storage side before setting an access path:

- ETERNUS DX series, ETERNUS2000, ETERNUS4000, ETERNUS8000

By setting up the zone (host affinity) function, you can use storage areas efficiently on a storage area network. To use this zone (host affinity) function, you must set up a Affinity Group/zone on the storage side before setting an access path.

- ETERNUS DX60/DX60 S2, DX80/DX80 S2, DX90/DX90 S2, DX400 S2 series, DX8000 S2 series

If linked affinity groups are used, then the WWN settings of the server nodes to be used must be set in advance.

Use ETERNUS Web GUI to set the WWN settings. When setting it, select a host response whose Host Specific Mode is in HP-UX Mode.

Connected state of the FC cable between devices

- When setting an access path, an HBA and CA must be physically connected via a Fibre Channel switch.

Device status

- Each HBA must be connected to a Fibre Channel switch and operate as the N port or NL public.
- All of a Fibre Channel switch on the way of the access path setting, HBAs, server nodes, CAs and storages should be operating normally.

6.2.3.2 Setting

Set access paths for the Fibre Channel.

Access path setting procedure

Configure the access path environment by installing additional storage and connecting a Fibre Channel cable, etc.

1. Preprocessing for the device driver definition file

- When ETERNUS Multipath Driver 2.0.1 or higher is used

No preprocessing needs to be performed.

- Solaris 9 OS

- This procedure changes the disk array control driver from sd to hddv when the `grmpdautocon` command is executed when the hot system expansion function (`hddvadmM`) is enabled for setting a hard disk driver (hereinafter abbreviated as hddv).

Check whether the hddv configuration information file (`hddv.conf`) has been created.

```
# ls /kernel/drv/hddv.conf
```

If the file is not found, execute the following command and create the `hddv.conf` file:

```
# hddvadm -M
```

When the file is found, check whether the file content is of class or parent type.

(Example)

Example of `hddv.conf` of the parent type

```
name="hddv" parent="scsi" target=16 lun=0;
```

Example of `hddv.conf` of the class type

```
name="hddv" class="scsi" target=16 lun=0;
```

The class type of file requires no preprocessing. (All `hddv.conf` files created by the hot system expansion command [`hddvadm M`] are of the class type.)

For the parent type of file, follow the instructions below to initialize the non-hot system expansion environment and move into the hot system expansion environment. To directly use the non-hot system expansion environment, follow the procedure for setting non-hot system expansion (`hddvadm m`).

1. Execute `hddvadm -i`.
2. Confirm that `/kernel/drv/hddv.conf` is not present.
3. Delete the entries made for recognizing the disk array device from the sd configuration information file (`sd.conf`).
4. Execute the following command and create an hddv configuration information file (`hddv.conf`):

```
# hddvadm -M
```

- In the MPLB2.0 or MPLB2.1 environment with non-hot system expansion specified (`hddvadm -m`) or in MPHD environment, the commands for adding and removing paths are not supported. Accordingly, the multipath configuration must be canceled once. Execute the destroy command of `#iompadm` to cancel the multipath configuration.

- In the multipath disk control (MPLB, MPHD, or HDDV) environment with non-hot system expansion is specified (`hddvadm -m`) or with normal setting (`hddvadm-m`), execute the following command on the target server node:

```
# hddvadm -i
```

By executing this `hddvadm -i` command, `hddv.conf` file moves to `sd.conf` and `mphd.conf/mplb.conf` file is saved. However, in the hot system expansion environment or in the `hddvadm -M` execution environment, hot system expansion can be performed without executing the `hddvadm -i` command. Therefore, this command need not be set.

2. Select the target server node and add an access path by using the Web Console.

3. [On a Solaris OS server node with multipath disk control (ETERNUS Multipath Driver 2.0.1 or later)] Execute the command below on the target server node to enable the server node to recognize the storage device.

- To automatically build a multipath device, execute the `grmpdautoconf` command. Refer to the driver manual for details on the command.

```
# /usr/sbin/grmpdautoconf
```

To automatically build a multipath device that uses the ETERNUS multipath driver and has a path passing through multiple Fibre Channel switches, execute the command after confirming path redundancy and specifying the "-X" option (because the `grmpdautoconf` command cannot check whether the redundancy of a path passing through multiple Fibre Channel switches is guaranteed).

```
# /usr/sbin/grmpdautoconf -X
```

4. [On a Solaris OS server node with multipath disk control (MPLB, MPHD, HDDV2.2 or later) and hot system expansion specified (`hddvadm -M` execution environment)] Execute the following command on the target server node so that the target server node recognizes the storage unit.

- In Solaris 9 OS, `hddv.conf` is edited if needed (refer to the multipath disk control (MPLB, MPHD, HDDV) various driver manuals). The following command is executed on the server node to fetch a storage device.

```
# update_drv -f hddv
```

With the above setting, the `hddv` driver can recognize the logical storage unit. If necessary, execute the command that builds an extension path to the multipath instance or the command that configures the multipath instance. Refer to the applicable driver manual for information about the commands (`mplbconfig/iompadm add/iompadm new`).

5. [On a Solaris OS server node, in the multipath disk control (MPLB, MPHD, HDDV) environment with non-hot system expansion is specified (`hddvadm -m`), or in the environment without multiple disk control] Execute the following command on the target server node to enable the server node to recognize the device:

- If the HBA is SE0X7F21F, SE0X7F22F, XSEFC401AF, XSEFC402AF, SG-XPCI1FC-QF2, SG-XPCI2FC-QF2, SG-XPCI1FC-QL2, SG-XPCI2FC-QF2-Z, SG-XPCI1FC-QF4, SG-XPCIE2FC-QF8, SG-XPCIE2FC-EM4 or SG-XPCIE2FC-EM8

Check the storage *Ap_id* using the `cfgadm -al` command, and make the OS recognize the LUN using the `cfgadm -c configure Ap_id` command. For details about the commands, check the `man` command.

- Non-MPLB, MPHD, or HDDV environment (including the tape environment)

```
# touch /reconfigure
# /usr/sbin/shutdown -y -i6 -g0
```

- Multipath disk driver control (MPLB, MPHD, HDDV) environment (`hddvadm -m`)

```
# touch /reconfigure
# /usr/sbin/shutdown -y -i6 -g0
# hddvadm -m (The required part of sd.conf is moved to hddv.conf, and the saved mphpd.conf/
mplb.conf file is restored.)
# touch /reconfigure
# /usr/sbin/shutdown -y -i6 -g0 (Existing instances for each driver (mplb/mphpd/hddv) are
configured when the definition file is restored. For new instances, hddv instances are
configured.)
```

According to the environment, execute the command that builds an extension path to the multipath instance or the command that configures the multipath instance. Refer to the applicable driver manual for information about the commands (`mplbconfig/iompadm add/iompadm new`).

6. [Solaris OS server node] Arrange the files in `/dev/rdisk` with `# disks -C` command.
7. [Windows] Restart the unit so that the device is recognized. Even if the device is automatically recognized by Windows 2003, it is recommended to restart the unit so that the device is recognized again.
8. [Linux server node] Restart the unit so that the device is recognized.

9. [HP-UX server node] Restart the unit to execute device recognition. After restart, check the connection of the device and search for the device file (for example, /dev/dsk/c5t1d0) with #ioscan -funC disk command. If the device file does not exist, create the device file by executing #insf-H <H/W pathname > -e command for H/W path in which the device file is not detected.
10. [AIX server node] Restart the unit to execute device recognition.
11. [Other server nodes] Perform operations for device recognition.

When the operating system is VMware Infrastructure 3 Version 3.5 (or later), VMware vSphere 4 (or later) or VMware ESXi 3.5 (or later), reboot the VM host or, by using VMware Infrastructure Client, execute "Rescan" for the HBA that the access path has been set and perform [Reload Conf.] for applicable server node by using this software. Refer to "Access path management" in "Configuration management" in "4.1.8.2 VMware Infrastructure 3 Version 3.5 (or later), VMware vSphere 4 (or later) or VMware ESXi 3.5 (or later)" for the using method of VMware Infrastructure Client.

12. Check the access path from this software.

- [For Solaris OS server node]

/dev/rdisk/cXtXdX is created on the server node side and the access path is displayed.

- [Windows server node, Linux server node, HP-UX server node, or AIX server node]

A device is generated on the server node side, and the access path is displayed.



Note

Confirmation of the status of server node (HBA)-server node (HBA) and storage device (CA)-storage device (CA) access paths is performed by checking the zoning information for the fibre channel switch device using the Web Console. Deletion is performed by deleting the fibre channel switch device information in the Web Console.

Set the zoning shown below if the ETERNUS VS850 is operating. These are normally set during VS850 installation but can also be set on the Management Server.

- Host zone (zone between the host and the VS850)
- Storage zone (zone between the VS850 and storage)
- I/O group zone (zone for inter-node communication either within a VS850 I/O group or between I/O groups)
- Remote zone (zone for communication between different VS850 clusters)

These zonings are normally set during installation of the VS850, but for the storage zone, it is possible to set the switch device's zoning and the storage device's host affinity using this software's access path setting function.

For zones besides the storage zone, set the zoning for the switch device manually.

6.2.4 Deleting an access path

This software can delete access paths set by it and access paths for Fibre Channel switches.

Delete an access path for which one-to-one WWPN zoning is set for a Fibre Channel switch between server nodes (HBAs) or between storages (CAs) according to the zoning information in Fibre Channel switch properties.

The access path cannot be deleted to change the zone status of the switch to non-zoning (No Security). All the zoning settings of the switch are deleted when a user request to delete an access path is processed, this software creates a dummy zone. Although the loss of zone security as a result of deleting zoning can lead to inadvertent accessing of disk areas during operation, the dummy zone created prevents data destruction.

When changing the zone status of the switch to non-zoning (No Security), manually change the zone status of the switch to No Security. Note that this dummy zone will not be deleted even if access path addition processing is executed.

6.2.4.1 Preparations

Notes

- Only "System Administrator" account can delete access paths.
- You cannot delete access paths defined during setup other than for setting one-to-one WWPN zoning such as port zoning, WWNN zoning, or multi-port WWPN zoning in a Fibre Channel switch. (Only the one-to-one WWPN zoning setting is valid in this software.) In such cases, delete a zone from the zone information of Fibre Channel switch properties, or log in directly to the Fibre Channel, and change the setup.
- Verify that all Fibre Channel switches cascaded to the Fibre Channel switch associated with the access path setting can be correctly recognized in the current status. Once an access path is changed because a Fibre Channel switch is temporarily disconnected from the cascade connection, the old cascade connection cannot easily be recovered. (In this event, execute the `cfgClear` command to delete zoning information for the Fibre Channel temporarily disconnected from the cascade connection. This enables cascade reconnection.)
- When deleting an access path that is configured in the FC routing functionality LSAN zone in this software, manually delete the LSAN zone in the device in advance.

Server node setting

- If Fujitsu multipath disk control mechanism or `msdsm` on the Windows server node, be sure to shut down the server node before deleting an access path. If an access path is deleted while the server node is in operation, a very long time is required to shut down the server node later because of the operation of Windows path detection logic.
- To delete the access path of Fujitsu multipath disk control mechanism or `msdsm` on the same server node as the Management Server from this software, shut down the Management Server, disconnect the FC cable from the access path to be deleted, restart the admin server, and delete the access path.
- For Unix, execute `umount` for the access path to be deleted.

Physical removal (only for Solaris OS)

- When ETERNUS Multipath Driver 2.0.1 or higher is used and the access path to be deleted is physically connected to a Fibre Channel switch for which no zone is set, physically remove the access path in advance such as by disconnecting the cable for which access path deletion is to be executed.

6.2.4.2 Setting

Delete a set access path.

1. [Solaris OS (MPLB, MPHD environment)] Release the multipath setting.

Refer to the relevant driver's manual for information on the command and command parameters.

- If MPLB 2.2 and higher, execute the following command:

```
# mplbconfig (arguments are required, -d option)
```

- If MPLB 2.1 and former or MPHD, execute the following command:

```
# iompadm (arguments are required, destroy option)
```

MPLB2.1 or earlier and MPHD do not support the commands that add and remove paths. Delete the multipath instance by using the above command (`iompadm destroy`).

2. [Solaris OS (MPLB, MPHD, HDDV environment)] Release HDDV.

When the hot system expansion function of server node is disabled, execute the following commands:

```
# hddvadm -i
```

`hddv.conf` is moved to `sd.conf`, and the `mphd.conf/mplb.conf` file is saved.

3. [Windows] If Fujitsu multipath disk control mechanism or msdsm is set, shut down the Windows server node. If the Windows server node is active in this environment, this software suppresses access path deletion.
4. Using the Web Console, execute the deletion of the target access path.
5. [ETERNUS Multipath Driver 2.0.1 or higher] Execute the grmpdautoconf command to implement path removal. (Refer to the *ETERNUS Multipath Driver User's Guide* for details of the command specifications.)
6. [Solaris OS] Follow the procedure below so that the server node recognizes the storage unit.

In the hot system expansion (hddvadm -M) environment of ETERNUS Multipath Driver 2.0.1 or higher, MPLB, MPHD, or HDDV, execute the command shown below. After path removal, the server must be restarted to enable the Fibre Channel card definition of the server node.

```
# /usr/sbin/shutdown -y -i6 -g0 (restarts the server)
# disks -C
```

In an environment using MPLB2.2 or later, MPHD, and HDDV with non-hot system expansion or normal specified (hddvadm -m), execute the following operations:

- #touch /reconfigure
- # /usr/sbin/shutdown -y -i5 -g0
- Start it in single user mode.
- # hddvadm -m (The required part of sd.conf is moved to hddv.conf, and the saved mphd.conf/mplb.conf file is restored.)
- #touch /reconfigure
- # /usr/sbin/shutdown -y -i6 -g0 (Instances for each driver (mplb/mphd/hddv) are configured when the definition file is restored.)
- # disks -C

In an environment using MPLB2.1 or earlier

- #touch /reconfigure
- # /usr/sbin/shutdown -y -i5 -g0
- Start it in single user mode.
- # hddvadm -m (The required part of sd.conf is moved to hddv.conf, and the saved mphd.conf/mplb.conf file is restored.)
- #touch /reconfigure
- # /usr/sbin/shutdown -y -i6 -g0
- # disks -C
- Reconfigure the multipath by using the new #iompadm command.

In an environment where neither the hard disk driver (HDDV) nor multipath control (MPHD MPLB) is used

- #touch /reconfigure
- # /usr/sbin/shutdown -y -i6 -g0
- # disks -C

7. Check the access path from this software.
8. [Windows] Restart the device.
9. [Linux] Restart the device.
10. [HP-UX] Restart the device.
11. [AIX] Restart the device.

12. [Other server nodes] Perform operations for device deletion recognition.

When the operating system is VMware Infrastructure 3 Version 3.5 (or later), VMware vSphere 4 (or later) or VMware ESXi 3.5 (or later), reboot the VM host or, by using VMware Infrastructure Client, execute "Rescan" for the HBA that the access path has been and perform [Reload Conf.] for applicable server node by using this software. Refer to "Access path management" in "Configuration management" in ["4.1.8.2 VMware Infrastructure 3 Version 3.5 \(or later\), VMware vSphere 4 \(or later\) or VMware ESXi 3.5 \(or later\)"](#) for the using method of VMware Infrastructure Client.

6.2.5 Access path inheritance

This software sets WWPN-based security settings on a device to form an access path. However, when the faulty part such as an adapter (controller) is replaced, the WWPN name may be changed because it is unique.

- Devices whose WWPNs are changed when the faulty part such as an adapter (controller) is replaced:

All HBAs and ETERNUS LT230, etc.

- Devices whose WWPNs are not changed when the faulty part such as an adapter (controller) is replaced:

ETERNUS Disk storage system, ETERNUS LT250/LT270, etc.

Operation can be performed as is if WWPNs are not changed. If WWPNs are changed because an adapter (controller) is replaced, security functions of the WWPNs constituting the access path must be changed to those of new WWPNs. This operation is defined as "access path inheritance" and it provides a function that changes the WWPN security settings managed by this software.

Refer to the following sections for the access path inheritance procedure after replacing the faulty parts.

- ["8.3.1.2 Access path inheritance after HBA replacement"](#)

6.2.6 To manage Fibre Channel switch that has already set in port zoning

One-to-one WWPN zoning setting is recommended in this software to realize the complete zoning security management as described in ["4.2.1 SN200 \(Brocade\) Fibre Channel switch"](#), though port zoning is possible to be performed. The procedure to change into one-to-one WWPN zoning setting is as follows.

1. Confirm that all the monitored devices are connected with all the switch ports.
2. Change the sanma.conf. Refer to ["A.2 sanma.conf Parameter"](#) and specify 1 in ["SET_SW_ZONING_ALWAYS"](#).
Either perform an update to the setting file using the Web Console or restart Manager to reflect the content of this file.
3. In the Web Console, add an access path corresponding to the port zoning.
4. After adding of the access path is complete, check that WWPN zoning which indicates information identical to that of the port zoning is displayed on the Web Console, and then delete the specified port zoning.



.....
For the multiple ports zoning setting, do not delete the multiple port zoning until WWPN zoning corresponding to each port zoning.
.....

5. Repeat the procedure from steps 3 to 4.
6. If necessary, return the setting that is executed in step 2 to the former setting.

To change the zoning setting can be executed in zone administration window in WEBTOOLS in Fibre Channel switch and by Telnet function.



.....
The change to the zoning settings is performed on a Fibre Channel switch equipped with the latest firmware in the fabric (all of the Fibre Channel switches in the cascading connection) that contains the Fibre Channel switch selected when this properties window is opened.
.....

6.3 Event Display and Linkage

This software receives and decodes an SNMP Trap that is sent from a device, and handles a device status change as an event for managing device errors.

The event is created based on the contents of SNMP traps and user settings.

The processing described below is performed for generated events.

- [Displaying event logs](#)
- [Systemwalker Centric Manager linkage](#)
- [Shell/Bat linkage](#)
- [External script linkage](#)
- [E-mail notification](#)

As for the following event, this software only displays event logs, and other processing are not performed.

- Trap events common to devices (the trap common to devices in "Events in Notifications Sent from Monitored Devices" in the *ETERNUS SF Event Guide*)
- Start of performance data re-collection/Success of performance data re-collection event (Success of performance data re-collection, Success of performance data re-collection in "Performance Management Traps" in "Events in Notifications Sent from Monitored Devices" in the *ETERNUS SF Event Guide*)
- Event that indicates when the state changes into error(red) in the device polling function ("When the state changes into error(red)" in the device polling function "Device Polling Event" in the *ETERNUS SF Event Guide*)



See

Refer to "[Appendix A Customization](#)" for detailed information on how to customize SNMP Trap processing.

Displaying event logs

Generated events are displayed in the event log of the Web Console. Events are displayed shown as below.

Displayed items	details
type	Displays the level of a displayed event.
date	Displays time and date event occurred in Month DD, YYYY HH:MM:SS AM (or PM).
device	Displays the name of a device on which the event occurred. This may not be displayed for events by user operations.
message	Indicates the event ID and its details. Displays this ID when the event has the corresponding ID. This ID is defined in the manager that is monitoring the event. Refer to the <i>ETERNUS SF Event Guide</i> for details about events.



Note

If multiple SNMP Traps comprised of the same information are received from a device at the same time and date, only the first received SNMP Trap will be displayed on the event log.

Systemwalker Centric Manager linkage

Also, generated events are reported to Systemwalker Centric Manager. Refer to "10.1 Linkage with Systemwalker Centric Manager" for information on settings required in advance. The importance levels of the events are also reported.

Note

Events of the server node agent is not reported to Systemwalker Centric Manager. (Shell/Bat linkage is operated.) Execute fault monitoring by message monitoring function of Systemwalker Centric Manager.

Shell/Bat linkage

A generated event is specified in the call argument of the Shell file, such shown as below.

Platform of Manager	File name (full path)
Windows	\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\trapop.bat arg1 arg2 arg3 arg4 arg5 arg6 (\$ENV_DIR means "Environment Directory" specified at the Manager installation.)
Solaris OS, Linux	/etc/opt/FJSVssmgr/current/trapop.sh arg1 arg2 arg3 arg4 arg5 arg6

The "arg1" is the fault detail for the target device.

The "arg2" is the IP address for the target device.

The "arg3" is the server node name (FQDN) for the target device (if the full domain name cannot be confirmed, the IP address is set).

The "arg4" is the number of milliseconds that have elapsed from 00:00:00 GMT 01 Jan 1970 ("zero") to the current time.

The "arg5" is the fault level ("INFO", "WARNING", "ERROR").

The "arg6" is the name for the target device.

Rewriting the content of these shell/bat files enables the e-mail linkage of fault information or other Management Software linkage (such as issuing commands to Management Software and writing information to a log file managed by Management Software).

Sample Shell/Bat files are installed in the directories shown below. Copy this sample and create Shell/Bat files for linkage.

Platform of Manager	File location
Windows	\$ENV_DIR\ESC\Manager\opt\FJSVssmgr\lib\sample\trapop.bat (\$ENV_DIR means "Environment Directory" specified at the Manager installation.)
Solaris OS, Linux	/opt/FJSVssmgr/lib/sample/trapop.sh

If the Shell/Bat linkage function is not used, there is no need to create these Shell/Bat files.

The following are examples of scripts output in the system log or event log if an event occurs:

For Windows:

```
@echo off
EVENTCREATE /L SYSTEM /ID 999 /SO StorageCruiser /T ERROR /D "%4 %5 %3 %2 %~1"
```

For Solaris OS or Linux:

```
#!/bin/sh
logger -- "$4 StorageCruiser $5 $3 $2 $1"
```

Note

- The IP address of a target device is included in the event message output in the system log or event log.
- Perform event output into in the system log or event log in a Manager environment that does not coexist with a server node agent. In the Manager and server node agent coexisting environment, a message may repeatedly be output.

External script linkage

Any external script other than trapop.sh/trapop.bat of Shell/Bat linkage can be executed. Up to two scripts can be defined in each SNMP Trap XML definition file. Arguments for calling such scripts are common to those for Shell/Bat linkage.

Refer to "[A.6 SNMP Trap XML Definition File](#)" for information about the methods for defining.

Note

- External script linkages must be defined in the SNMP Trap XML definition file. Therefore, they are not available on devices where XML definition files are not provided.
- For shell scripts or batch files in Shell/Bat linkages or external script linkages, do not output processing results and processing progress on the screen (for example, do not perform such a process as displaying a message with the echo command). Be sure to describe "@echo off" at the head under Windows.

E-mail notification

A created event is notified by e-mail in the following format:

```
Subject: ETERNUS SF Event Mail
From: $1
To: $2

Severity: $3
Date: $4
Device IP: $5
Device Name: $6
Message: $7
```

\$1: Indicate e-mail address from where the notification is sent (You need to set it in advance.).

\$2: Indicates e-mail address where the notification is sent (You need to set it in advance.).

\$3: Indicates the fault level (Information, Warning, Error)

\$4: Indicates time and date when the event occurred.

\$5: Indicates IP address for the target device

\$6: Indicates a name of the target device

\$7: Indicates the fault detail

All Warning and Error events will be notified. For Information events, transition of the Thin Provisioning Pool using rate and reduction of Thin Provisioning Pool's capacity are notified. If you want to be notified other Information events, refer to "[A.6 SNMP Trap XML Definition File](#)".

Users can customize the displaying of events and descriptions of linkage for individual SNMP Traps. Refer to "[A.6 SNMP Trap XML Definition File](#)" for details.

Point

To perform Systemwalker Centric Manager linkage, Shell linkage, or external script linkage, either register the IP address and host name information for each device in the DNS server that is referenced by the Management Server, or define them in the /etc/hosts file on the Management Server so that the names of the devices registered in this software can be resolved.

6.4 Thin Provisioning management

This product can manage storage capacity virtualization operations that use the Thin Provisioning function of the ETERNUS Disk storage system. The functions below are provided.

Threshold monitoring

This function monitors the threshold values for the Thin Provisioning Pool capacity used. It can also change the threshold values.

Capacity management

This function displays the changes in capacity used for the Thin Provisioning Pool graphically.

6.4.1 Threshold monitoring

This function monitors the threshold values for the Thin Provisioning Pool capacity used.

Threshold values and Threshold monitoring status

The values of the "Caution threshold value" and the "Warning threshold value" set for each Thin Provisioning Pool and the Threshold monitoring status are displayed. The "Caution threshold value" and the "Warning threshold value" are prepared at the disk storage system, and are the threshold values for Thin Provisioning Pool capacity used.

Threshold value settings

The initial values for the "Caution threshold value" and the "Warning threshold value" are set by the disk storage system when a Thin Provisioning Pool is created. If required, change the settings for the capacity threshold values.

Procedure for setting threshold values

Set the threshold values by using the Web Console.

Action to take when threshold values are exceeded

If threshold values are exceeded, then follow the procedures below:

- Detection of status change

When a threshold value is exceeded, the product displays an SNMP Trap in the event log, which notifies the change in Thin Provisioning Pool status at the disk storage system.

- Refreshing

After checking the displayed event, perform [Reload Conf.] on the applicable storage system.

- Checking the status of the Thin Provisioning Pool

Start the Thin Provisioning Pool monitor window and check the Thin Provisioning Pool status. Extend disks or take other action in accordance with the exceeded threshold values.



See

.....

If the SNMP Trap that notifies of changes in the Thin Provisioning Pool status is not received due to packet loss or other reason, then the product detects the change by polling the Thin Provisioning Pool information of the disk storage system. Since the polling interval is one hour, the time from status change to detection is within one hour. The polling intervals can be customized. Refer to "[A.9 Polling Service Setting File](#)" for details.

.....



Information

.....

Even if capacity reaches "Caution threshold value" which is set for each LogicalVolume, SNMP trap will not be sent. "Caution threshold value" for LogicalVolume is a threshold value for unallocated capacity of LogicalVolume which is at the disk storage system.

.....

6.4.2 Capacity management

This function displays the Thin Provisioning Pool Capacity and its changes in the capacity used graphically to grasp the changes in the capacity used for the Thin Provisioning Pool.

This enables users to grasp the period to expand the size of the physical disk for the Thin Provisioning Pool, or to review the threshold setting according to the situation.



Information

The information of the Thin Provisioning Capacity and its capacity used is displaying in graph. The information is obtained everyday at 1:00:00.

You can change the time to obtain the information by using a polling service setting file. Refer to "[A.9 Polling Service Setting File](#)" for details.

6.4.2.1 Capacity Graph Window Types

It is possible to display the following graph.

One-month Graph window

The line graph displays data for the past 31 days from the present day.

The plot points are displayed on a daily basis.

One-year Graph window, One-decade Graph window

The line graph displays data for the past a year or a decade from the present day.

The plot points are displayed on a monthly basis.

Chapter 7 Performance Management

7.1 Overview

This software supports performance management functionality for fibre channel switch and ETERNUS Disk storage systems. This functionality enables users to get details about the operation and load statuses of devices.

Additionally, by knowing the number of active disks, it is possible to verify the Eco-mode status of the ETERNUS Disk storage system.



See

Refer to "[1.2.6 Support levels](#)" for details about supported devices.



Note

- Do not execute performance monitoring for a single device from more than one Management Server (administrative server) at the same time. The Softek Storage Cruiser administrative servers, the ETERNUS SF Storage Cruiser Management Server or the Systemwalker Resource Coordinator administrative servers
- The performance management functionality always starts up when the Management Server starts up. For devices in which performance management settings have been configured, performance information collection starts in the background. Accordingly, performance information is collected regardless of whether the Web Console is started or not. To stop performance information collection, execute performance management stop processing.

7.1.1 Performance Information Types

The following information can be managed: Performance monitoring can be set at different intervals, refer to "[7.2.3 Setting monitoring intervals](#)" for the settings available for each device.

On the following tables, "A" indicates "Available", "N/A" indicates "Not Available".

- Fibre Channel switch

	Performance information (Unit)	Fibre Channel switch
Port	Transfer rates of send/receive data (MB/S)	A
	Number of CRC errors	A

- ETERNUS Disk storage system

	Performance information (Unit)	ETERNUS DX400/ DX400 S2 series, ETERNUS DX8000/ DX8000 S2 series, ETERNUS4000, ETERNUS8000	ETERNUS2000	ETERNUS DX60/ DX60 S2,DX80/DX80 S2,DX90/DX90 S2
Logical Volume RAID Group	Read/Write count (IOPS)	A	A	A
	Read/Write data transfer rate (MB/S)	A	A	A

	Performance information (Unit)	ETERNUS DX400/ DX400 S2 series, ETERNUS DX8000/ DX8000 S2 series, ETERNUS4000, ETERNUS8000	ETERNUS2000	ETERNUS DX60/ DX60 S2,DX80/DX80 S2,DX90/DX90 S2
	Read/Write response time (msec)	A	A	A
	Read/Pre-fetch/Write cache hit rate (%)	A	A	A
Disk drive	Disk busy rate (%)	A	A	A
CM	Load (CPU usage) rate (%)	A	A	A
	Copy remaining amount (GB)	A	A	A
CA	Read/Write count (IOPS)	A	N/A	N/A
	Read/Write data transfer rate (MB/S)	A	N/A	N/A
CM Port	Read/Write count (IOPS)	N/A	A	A
	Read/Write data transfer rate (MB/S)	N/A	A	A
Device	Number of active disks (Disk)	A	A	A
	Power consumption (W)	A (ETERNUS DX400 S2 series and ETERNUS DX8000 S2 series only)	N/A	A
	Temperature(C)	A (ETERNUS DX400 S2 series and ETERNUS DX8000 S2 series only)	N/A	A

Note

- Do not simultaneously perform performance monitoring to a single device from multiple Management Server (administrative servers). The administrative server for Softek Storage Cruiser, the Management Server for ETERNUS SF Storage Cruiser, and the administrative server for Systemwalker Resource Coordinator are to be used for the performance monitoring.
- In order to prevent a discrepancy with the times shown on the performance graph due to a discrepancy in the internal clocks for the Management Server and the monitored device, it is recommended that you enable the NTP setting to the Management Server and the monitored device to synchronize the internal clocks.
- It is possible to reference performance information for the ETERNUS SF Storage Cruiser. However, there is some performance information which is not supported. Refer to the manual of Systemwalker Service Quality Coordinator for details. Note that the ETERNUS SN200 MDS series fibre channel switch device is not supported.

- If the monitored device has been restarted while performance monitoring was in progress, you may be unable to acquire accurate performance data immediately after the restarting of the device. It is recommended that you first halt performance monitoring before performing any tasks which entail restarting the monitored device.
- LogicalVolume(LUN) and RAIDGroup performance information including LogicalVolume, created by LUN Concatenation in the ETERNUS4000 and ETERNUS8000 that firmware versions are before V11L40, will not be displayed.
- Performance information about the ETERNUS Disk storage system main frame volume, MVV/SDV, and ODX Buffer Volume are not supported. The value for the performance information about the RAID Group containing SDV cannot be guaranteed. Performance information values for RAIDGroup, excluding Thin Provisioning and Flexible Tier, do not contain ODX Buffer Volume.
- Performance monitoring cannot be done for the ETERNUS Disk storage system which do not have LogicalVolume (LUN).
- The CA/CM Port performance information for the ETERNUS Disk storage system device displays the following information.

Device	Host interface							
	FC			iSCSI			FCoE	SAS
	CA	RA	CA/RA	CA	RA	CA/RA		
ETERNUS8000 models 700, 900, 1100 and 2100 ETERNUS4000 models 300 and 500	A	A (*1)	N/A	N/A	N/A	N/A	N/A	N/A
ETERNUS DX8000 series ETERNUS DX400 series ETERNUS8000 models 800, 1200 and 2200 ETERNUS4000 models 400 and 600	A	A (*1)	N/A	A	A (*1)	N/A	N/A	N/A
ETERNUS DX90	A	A (*1)	N/A	N/A	N/A	N/A	N/A	N/A
ETERNUS DX80 ETERNUS DX60 S2 ETERNUS DX60	A	N/A	N/A	A	N/A	N/A	N/A	N/A
ETERNUS DX80 S2	A	A (*1)	A (*2)	A	N/A	A (*2)	A	N/A
ETERNUS DX8000 S2 series ETERNUS DX400 S2 series ETERNUS DX90 S2	A	A (*1)	A (*2)	A	A (*1)	A (*2)	A	N/A

*1: Performance information during the execution of REC or ROPC is displayed as follows:

- It is displayed as Read performance information, if the port is set on the Initiator.
- It is displayed as Write performance information, if the port is set on the Target.

*2: Performance information during the execution of REC includes the following information.

- Read performance information includes the performance information during the execution of REC, if the port is set on the Initiator.
- Write performance information includes the performance information during the execution of REC, if the port is set on the Target.
- Performance information for VE ports used by 10 GbE(XGE) ports is not supported, and the values in the displayed performance information are not guaranteed. It is recommended that 0 be set for the transfer rate for VE ports used by 10 GbE(XGE) ports, and that performance and threshold values should not be monitored. Refer to "[A.10 Explanation of the Configuration Settings File](#)" for details on how to set this value.
- The CPU and ROE usage rates are displayed for the CM load (CPU usage) for ETERNUS DX400/DX400 S2 series, ETERNUS DX8000/DX8000 S2 series, ETERNUS4000 models 400 and 600, and ETERNUS8000 models 800, 1200 and 2200. For other ETERNUS Disk storage systems, the ROE usage rate is not displayed. Also, for ETERNUS Disk storage systems that do not have a

ROE, the parity generation processing for RAID5 and RAID6 and encryption processing that would otherwise be performed by the ROE are performed by the CM and the CM-CPU.

- RDB performance information cannot be displayed in environments that use the REC Disk Buffered Consistency function.

7.1.2 Performance Graph Window Types

It is possible to display the following graphs.

One-hour Graph window

Based on the time selected as monitoring interval, a line graph for a one-hour period is displayed. For example, if the monitoring interval is 30 seconds, a line graph for a one-hour period with values obtained at an interval of 30 seconds is displayed.

One-day Graph window

Based on the mean values for 10-minute periods, a line graph for a one-day period is displayed.

One-week Graph window

Based on the mean values per hour, a line graph for a one-week period is displayed.



Information

- Following performance values are displayed as they are obtained from the device (not their mean values).
 - CM Copy remaining amount
 - Number of active disks
 - Power consumption
 - Temperature
- If the summer time functionality of the operating system is enabled, a part of the graph that is supposed to show the data around the switch to summer time may not be displayed correctly.
- Each performance graph may not be able to be displayed at every monitoring interval, per 10-minutes and per 60-minutes, depending on the LAN traffic condition or network environment (e.g. the Management Server and target device of the performance monitoring exist in the different subnets).

7.1.3 Threshold Monitoring Types

Threshold monitoring is supported for Fibre Channel switch and ETERNUS Disk storage systems.

The threshold monitoring functionality sends an alarm or report when Fibre Channel switch or ETERNUS Disk storage systems performance value reaches a certain level (threshold value) under certain conditions in daily transaction operations.

The advantage of using the threshold monitoring is that the symptom of Fibre Channel switch or ETERNUS Disk storage systems performance drop caused by changes in data processing rates and transaction processing rates can be automatically and reliably detected in daily transaction operations.

The effect that can be expected from the threshold monitoring functionality is that operations in the most suitable environment are enabled. This is accomplished by preventing the adverse effect of performance drops through early detection of bottleneck locations, identification of their causes, and improvement of device configuration.

The threshold monitoring functionality can manage the following information: You can set multiple threshold values.

- Fibre Channel switch
 - Port throughput (%)

A port throughput value (MB/s) is monitored as the percentage (%) of an allowable tolerance to a maximum transfer capability (MB/s).
- ETERNUS Disk storage system
 - Response time (msec) of LogicalVolume (OLU)
 - Average use (busy) rate (%) of RAIDGroup (RLU, LUN_R)
 - CM load (CPU usage) rate (%)

Note

- The threshold monitoring function is always started when the Management Server is started, and the functionality starts threshold monitoring and obtaining performance information at the same time for a device for which performance management is specified. Accordingly, performance information is obtained and thresholds are monitored regardless of whether the Web Console is started or not. To end threshold monitoring, stop threshold monitoring from this software.
- For the CM load (CPU usage) rate, the ROE usage rate is not monitored.

7.2 Flow of Performance Management

When a user gives an instruction for performance management of a target device using the Web Console, the performance management unit for this product saves the device performance data for each device, and stores them as performance data to the Management Server. This performance data is displayed on a graph.

7.2.1 Checking disk space on the Management Server

To conduct performance monitoring, sufficient disk space is required on the Management Server for performance data storage. Make sure that sufficient disk space is ensured referring to *ETERNUS SF Installation and Setup Guide*. This software is capable of deleting performance data overdue the specified holding period. The default is seven days and data exceeded this period are automatically deleted. This period can be modified. To change the number of days to store performance data refer to "[7.5 Definition File](#)".

7.2.2 Instruction for performance management

When performing performance management, configure and start the performance management by using the Web Console.

In ETERNUS Disk storage systems, enter the minimum and maximum values for the performance information securement target Logical Volume (LUN_V). Setting LogicalVolume can reduce the effect of obtaining performance information on disk areas where performance data is saved and reduce the load. Setting LogicalVolume prevents allocation of more space than necessary for Logical Volume. Consequently, the recommended entry for Logical Volume is the minimum value for obtaining performance data.

Information

Since performance information is obtained internally in units of 64 for Logical Volume, performance information in the neighboring area of the Logical Volume setting is also obtained.

For example, if a range of 70 to 80 is set for Logical Volume (LUN_V) on the screen, the information of Logical Volume between 64 and 127 is obtained internally.

After instructing it to start the performance management, the monitoring range which is displayed on the Web Console is not the value specified at the start time but the value converted to units of 64 for Logical Volume.

 **Point**

The maximum transfer rate for the Fibre Channel switch VE port is set as 1Gbps by default.

If the FCIP trunking function or FCIP data compression function is enabled and a transfer rate of 1Gbps or more will occur for the VE port, then change the VE port transfer rate.

Refer to "[A.10 Explanation of the Configuration Settings File](#)" for details on how to set this value.

7.2.3 Setting monitoring intervals

Enter the interval at which performance information is secured in the ETERNUS Disk storage systems and Fibre Channel switch common settings. You can specify 5, 10, 30, 60, 300, or 600 seconds as the interval. However, intervals that can be specified vary depending on device models and the number of Logical Volumes indicating performance level being maintained.

Monitoring condition		Specifiable interval (seconds)					
Device model name	Number of LogicalVolumes whose performance is maintained	5	10	30	60	300	600
ETERNUS DX60/DX60 S2/DX80/DX90 ETERNUS2000	128 or less	A	A	A	A	A	N/A
	129 to 2,048	N/A	N/A	A	A	A	N/A
	2,049 or more	N/A	N/A	N/A	A	A	N/A
ETERNUS DX80 S2/DX90 S2	No limitation	N/A	N/A	A	A	A	N/A
ETERNUS DX400 series ETERNUS DX8000 series ETERNUS4000 ETERNUS8000	256 or less	N/A	N/A	A	A	A	A
	257 to 1,024	N/A	N/A	N/A	A	A	A
	1,025 to 8,192	N/A	N/A	N/A	N/A	A	A
	8,193 or more	N/A	N/A	N/A	N/A	N/A	A
ETERNUS DX400 S2 series ETERNUS DX8100 S2	1,024 or less	N/A	N/A	A	A	A	A
	1,025 or more	N/A	N/A	N/A	A	A	A
ETERNUS DX8700 S2	1,024 or less	N/A	N/A	N/A	A	A	A
	1,025 to 8,192	N/A	N/A	N/A	N/A	A	A
	8,193 to 16,384	N/A	N/A	N/A	N/A	N/A	A
ETERNUS SN200 series Brocade series ETERNUS SN200 MDS	-	A	A	A	A	N/A	N/A

"A" indicates "Available", and "N/A" indicates "Not Available".

 **Point**

In LAN traffic or cross-subnet (where there is a gateway between the performance monitoring target device and the Management Server) situations, it may not be possible to obtain the performance information inside the monitoring interval that was set. Please change the monitoring interval when you cannot acquire performance information on each monitoring interval.

 Note

- The Fibre Channel switch and Fibre Channel switch blade as shown in the table below, set a monitoring interval according to the FC transfer rate. If this setting is incorrect, it might not be possible to obtain the correct performance value from the device.

Device model name	Monitoring interval	Transfer rate
ETERNUS SN200 series Fibre Channel switch	5 seconds	1-25Gbps
Brocade Fibre Channel switch (except for Brocade 6510, Brocade DCX8510-8/8510-4, and Brocade 6505)	10 seconds	1-12Gbps
	30 seconds	1-4Gbps
PRIMERGY Fibre Channel switch blade	60 seconds	1-2Gbps

- On the performance information for the number of active disks, power consumption and temperature, the performance monitoring interval sets 60 seconds if its interval is set to shorter than 60 seconds.

Since the performance management unit is started as a daemon of the Management Server, the unit continues obtaining performance information while the Management Server is active, without starting the Web Console.

The logical configuration of the storage device is recognized, and the obtaining of performance information starts. At the start of obtaining performance information of the selected storage system, an amount of time (tens of seconds to several minutes) is spent to obtain the logical configuration before any performance information is actually obtained.

Performance monitoring status, description and action are described as follows:

Performance monitoring status	Description	Action
Monitoring	Shows that performance monitoring works normally.	No action is required.
Recovering	Shows that performance monitoring is in recovery state.	Management Server cannot communicate to devices. Check the network and device conditions. If logged on to the ETERNUS Web GUI, log off from it.
Error	Shows that performance monitoring is in error state.	It is possible that writing to performance information file failed. Check the write access to file and the file system capacity and then perform the following steps. Refer to " 7.2.10 Performance data " for the location to store performance information file in: 1. Record the performance monitoring settings contents <Recorded settings contents> - Interval before obtaining performance information (in seconds) - Performance monitoring targets (only for ETERNUS Disk storage system. Minimum LUN_V, Maximum LUN_V) 2. Stop performance monitoring Refer to " 7.2.8 Instruction for stopping performance management ". 3. Start performance monitoring based on the settings contents recorded in step 1 Refer to " 7.2.2 Instruction for performance management " and " 7.2.3 Setting monitoring intervals ".

Performance monitoring status	Description	Action
		If despite of the above steps having been taken, any performance monitoring error is not resolved, internal error may be occurring. Contact a Fujitsu system engineer.

7.2.4 Displaying performance information of the selected device

Confirm by displaying the graph using the Web Console.

In addition, the performance information can be output to the CSV format file by using the performance information operation command (storageadm perfdata).

7.2.5 Displaying Fibre Channel switch performance information

Select a port whose performance information you want to display in graph.

7.2.6 Displaying storage performance information

7.2.6.1 Displaying LogicalVolume and RAIDGroup performance information

Select the number of LogicalVolume or RAID Group whose performance information you want to display in graph.



Note

- LogicalVolume and RAIDGroup performance information including LogicalVolume, created by LUN Concatenation in the ETERNUS4000 and ETERNUS8000 that firmware versions are before V11L40, will not be displayed.
- Performance information about the ETERNUS Disk storage system main frame volume, MVV/SDV, and ODX Buffer Volume are not supported. The value for the performance information about the RAID Group containing SDV cannot be guaranteed. Performance information values for RAIDGroup, excluding Thin Provisioning and Flexible Tier, do not contain ODX Buffer Volume.

7.2.6.2 Displaying disk (physical drive) performance information

Select the number of the disk whose performance information you want to display in graph.

7.2.6.3 Displaying CM performance information

Select the CM or CM CPU whose performance information you want to display in graph.

7.2.6.4 Displaying CA and CMPort performance information

Select the CA or CM Port from a list of ports whose performance information you want to display in graph.

7.2.6.5 Displaying the number of active disks, power consumption, and temperature performance information

Select the performance information you want to display in graph.



When the specified ETERNUS Disk storage system has no Eco-mode function, the number of active disks, power consumption and temperature graph is not displayed. Refer to "[1.2.4 Energy-saving operation for storage device](#)" for the ETERNUS Disk storage systems that have the Eco-mode function.

Before the displaying the performance information for the number of active disks, power consumption and temperature, it is necessary to upgrade to the firmware that supports the Eco-mode operation and change the composition of the device.

7.2.7 Examples of use of performance management

If an I/O delay from the server node to a storage system occurs, the user can check for the cause in the storage system by using the methods described below. These are only examples, so all causes of I/O delays cannot be determined by use of these methods.

1. Identify the time when the I/O processing delay occurred and the access path where the delay occurred.
2. Use this software to check the AffinityGroup number and LogicalVolume number of the ETERNUS Disk storage system defined in the target access path.
3. Using performance management, display and check the target LogicalVolume performance values.
4. If a response of the LogicalVolume unit takes a long time, check RAID Group performance. If a response of RAID Group also takes a long time, find another Logical Volume belonging to RAID Group, and find the LUNs to which the Logical Volume is allocated. Check the I/O statuses of these LogicalVolumes, and check for a heavy load on RAID Group. If there is a heavy load, move the appropriate LogicalVolume to another RAID Group, or take other appropriate action.

7.2.8 Instruction for stopping performance management

Execute performance management processing on the Web Console.

7.2.9 Updating configuration information

Device configuration information is independently maintained in the performance management functionality.

To change the device configuration, update the device configuration information that is maintained by the performance management functionality according to the procedure shown below. Also perform the update if the configuration for a device used to execute performance monitoring and threshold monitoring has been changed.

If the configuration for a device used to execute performance monitoring and threshold monitoring has been changed, the configuration information before the update is used for performance monitoring and threshold monitoring. Performance information and threshold monitoring, shown in the procedure below, cannot be guaranteed prior to the configuration information update.

<Configuration information update procedure>

1. Record the performance monitoring settings. (if performance monitoring is used)
<Settings for recording>
 - Range of Monitoring Volume No
 - Minimum Monitoring Volume No (only for ETERNUS Disk storage system)
 - Maximum Monitoring Volume No (only for ETERNUS Disk storage system)

- Monitoring Interval Time
- 2. Stop performance monitoring. (if performance monitoring is used)
Refer to "7.2.8 Instruction for stopping performance management" for details.
- 3. Change the configuration of the supported device.
- 4. Start performance monitoring based on the settings recorded in step 1. (if performance monitoring is used)

<Setting>

- Range of Monitoring Volume No (when specifying Performance monitoring targets, select "Partial")
- Minimum Monitoring Volume No (only for ETERNUS Disk storage system)
- Maximum Monitoring Volume No (only for ETERNUS Disk storage system)
- Monitoring Interval Time
- Create Device Configuration File (Select "Yes")

Refer to "7.2.2 Instruction for performance management" and "7.2.3 Setting monitoring intervals" for details.

7.2.10 Performance data

Performance data is saved in CSV files in the following directory of the Management Server:

Platform for manager	Location
Windows	\$TMP_DIR\Manager\var\opt\FJSVssmgr\current\perf (\$TMP_DIR means "Work Directory" specified at the Manager installation.)
Solaris OS, Linux	/var/opt/FJSVssmgr/current/perf

You can save these files by saving the entire directory as necessary, and you can display old information as necessary by recovering it in the same format.

However, the automatic deletion functionality operates in the performance data. When restoring, execute it after confirming days of the data retention duration. Refer to "A.4 perf.conf Parameter" for the data retention duration.



Example

Case of Solaris OS:

- Backup

```
# cd /var/opt/FJSVssmgr/current/perf/
# tar -hcf - csv |compress -c > csv.backup.tar.Z
```

- Restore

```
# cd /var/opt/FJSVssmgr/current/perf/
# uncompress -c /var/opt/FJSVssmgr/current/perf /csv.backup.tar.Z | tar -xvf -
```

7.3 Flow of Threshold Monitoring

When a user uses the Web Console to issue an instruction for threshold monitoring of the devices subject to performance management, this software then sequentially analyzes the performance data.

If a problem is detected from the performance information, it is displayed as an alarm in the Threshold Monitoring Alarms.

Information

When a problem is displayed as an alarm in the Threshold Monitoring Alarms, the event level is shown as [Warning].

7.3.1 Checking disk space on the Management Server

For threshold monitoring, users must prepare disk space on the Management Server to save condition reports of the Threshold Monitoring Alarms. About 4 MB is required. Make sure that the server has sufficient disk space. This software has a functionality for deleting condition report data whose set retention duration days have passed. Data stored for 366 days or more is automatically deleted. Change this retention duration setting as required.

7.3.2 Instruction for threshold management

Enable the threshold monitoring on the target device. Then you can set the threshold monitoring condition. To do so, however, performance information of the device must have already been obtained by performance management.

7.3.3 Setting the threshold monitoring hours

Setting the threshold monitoring hours enables to set a time period for threshold monitoring. If no time period is set, thresholds are monitored and alarms are reported for all time periods.

7.3.4 Setting the threshold monitoring information

Define threshold setting information of the target device, and issue an instruction to start monitoring. You can set multiple thresholds setting information on each device. Incidentally, since the threshold monitoring unit is started as a daemon of the Management Server along with the performance management unit, the threshold monitoring unit continues threshold monitoring while the Management Server is active, regardless of the access from the Web Console.

Note

For the CM load (CPU usage) rate, the ROE usage rate is not monitored.

7.3.5 Instruction for stopping threshold monitoring

Stop threshold monitoring for the target device. The Management Server continues to secure performance data from the device, but monitoring of the threshold is halted.

7.4 Evaluation Criteria for Thresholds in Threshold Monitoring

Storage thresholds

Standard storage thresholds are listed below.

	Online response-oriented system	Batch throughput-oriented system
LogicalVolume Response	30 ms or less	-
RAIDGroup Busy Rate	60% or less	80% or less
CM Busy Rate	80% or less	90% or less

For a response-oriented system such as for online applications, implementing LogicalVolume responses within 30 ms is a standard for stress-free storage operation. To implement responses within 30 ms, suppress the RAIDGroup busy rate to 60% or less and the CM busy rate to 80% or less.

In a throughput-oriented system such as for batch applications, LogicalVolume responses are extended to a few milliseconds because sequential access increases the cache hit ratios. However, the cache hit ratios are greatly affected by application access and the values change a great deal. As a result, responses may vary from a few milliseconds to 50 ms or more. Thus, for batch applications, there is no standard threshold for LogicalVolume responses.

To improve throughputs for batch applications, users must optimize the use of storage resources. Note, however, that performance may deteriorate rapidly if the above threshold is exceeded. For this reason, make it a standard to suppress the RAIDGroup busy rate to 80% or less and the CM busy rate to 90% or less.

During hours in which advanced copy is processing, advanced copy processing itself increases the CM busy rate. For this case, set thresholds in consideration of execution of advanced copy.

Thresholds of switch ports

The threshold and lower limit value vary depending on the type of applicable switch (1 Gbps, 2 Gbps etc). When the switch type is 1 Gbps, the maximum value (100% use rate) is 100 MBps. When the switch type is 2 Gbps, the maximum value is 200 MBps. For the threshold, specify the allowable utilization (%) corresponding to the maximum value.

For instance, when 90% is specified for the threshold of a 2 Gbps type switch, the threshold of the throughput is:
 $200 \text{ MBps} \times 90\% = 180 \text{ MBps}$ (total of reception and transmission)

An alarm is given when the throughput reaches 180 MBps.

Switch port threshold monitoring is effective when there is a difference in the numbers of paths between the server and storage.

Figure A Application + backup system

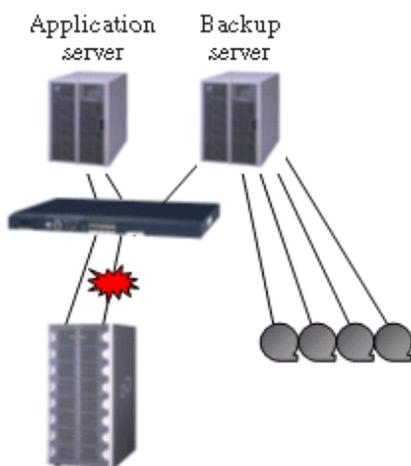
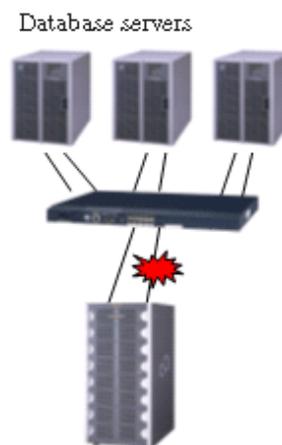


Figure B Cluster system (example: Oracle RAC)



7.5 Definition File

The following items for performance management can be set up in perf.conf file.

- The number of days to retain performance data
- The number of generations of log files (perflog.*)

- Whether to use the performance management for the number of active disks, power consumption and temperature
- Whether to use the performance management for iSCSI port



See

.....
Refer to "[A.4 perf.conf Parameter](#)" for the settings.
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Chapter 8 Maintenance of Devices to be Managed

8.1 Windows displayed in the event of a fault and troubleshooting

If a fault occurs on a device, an error description of the fault is output to the event log in the Web Console, the device status is also changed to [Error] or [Warning] if the support level of the device is A or B. The criteria of [Error] and [Warning] depends on the device definition. If this product can identify an access path affected by the fault, the access path status is changed to [Error].

For a device whose support level is I, an error description of a fault on the device is not output to the event log by default. The color of the device status also remains unchanged. However, if all of the following conditions are satisfied, it is possible to output an error description of the fault to the event log to change the color of the device status:

- The device supports SNMP Traps.
- The device IP address is specified during manual embedding.
- The SNMP Trap XML definition file has been created.



Refer to "[A.6 SNMP Trap XML Definition File](#)" for information on how to create the SNMP Trap XML definition file.

On the Web Console, check for faults in the order shown below and take corrective actions as required.

For middleware errors not including server node HBA and multipath faults, only events are reported. To troubleshoot middleware errors, refer to the appropriate middleware manuals.

If the ETERNUS Disk storage system is in an [Error] or [Warning] state

1. On the global navigation tab, click **Storage**.
2. On the Main pane in the disk storage system overview screen, click the target name.
3. On the Main pane in the disk storage system details screen, click the target name.
4. The Maintenance screen for the ETERNUS Disk storage system is started. Find the failed component in the ETERNUS Disk storage system.
For replacement of failed components, contact a Fujitsu customer engineer.

To view the status of CE, DE, ports and disks in the ETERNUS Disk storage system, click **Component** in the Category pane of the Web Console. Before checking the latest status of CE, DE, ports and disks, execute [Reload Conf.] for the ETERNUS Disk storage system.

If the tape library is in an [Error] or [Warning] state

1. On the global navigation tab, click **Storage**.
2. On the **Storage** pane, click **Tape Library**.
3. On the Main pane in the manually embedded tape library overview screen, click the target name.
4. On the Main pane in the tape library details screen, click the target name.
5. The Maintenance screen for the tape library is started. Find the failed component in the tape library.
For replacement of failed components, contact a Fujitsu customer engineer.

If the manually embedded disk storage system is in an [Error] or [Warning] state

1. On the global navigation tab, click **Storage**.
2. On the **Storage** pane, click **Disk Array(Manual)**.
3. On the Main pane in the manually embedded disk storage system overview screen, click the target name.

4. On the Main pane in the manually embedded disk storage system details screen, click the target name.
5. The Maintenance screen for the disk storage system is started. Find the failed component in the disk storage system.
For replacement of failed components, contact a Fujitsu customer engineer.

When replacing adapters (CA), refer to "If the adapter (CA) of manually embedded disk storage system and manually embedded tape library is replaced" in "[8.3.3 Replacing faulty components of a manually embedded device](#)". Moreover, the replacement of failed components, contact a Fujitsu customer engineer as required.

If the manually embedded tape library is in an [Error] or [Warning] state

1. On the global navigation tab, click **Storage**.
2. On the **Storage** pane, click **Tape Library(Manual)**.
3. On the Main pane in the manually embedded tape library overview screen, click the target name.
4. On the Main pane in the manually embedded tape library details screen, click the target name.
5. The Maintenance screen for the tape library is started. Find the failed component in the tape library.
For replacement of failed components, contact a Fujitsu customer engineer.

When replacing adapters (CA), refer to "If the adapter (CA) of manually embedded disk storage system and manually embedded tape library is replaced" in "[8.3.3 Replacing faulty components of a manually embedded device](#)". Moreover, the replacement of failed components, contact a Fujitsu customer engineer.

If the Fibre Channel switch is in an [Error] or [Warning] state

1. On the global navigation tab, click **Network**.
2. On the Main pane in the switch overview screen, click the target name.
3. On the Main pane in the switch details screen, click the target name.
4. The Maintenance screen for the Fibre Channel switch is started. Find the failed component in the Fibre Channel switch.
For replacement of failed components, contact a Fujitsu customer engineer.

If any port is in Error state due to SFP failure, the status of the affected access path is displayed as [Error].

If an access path is defined in the access path settings of this product, the zoning setting of the Fibre Channel switch is defined as WWPN zoning. Therefore, if a Fibre Channel switch port fails, the Fibre Channel cable connected to it can be reconnected to another Fibre Channel switch port, and operation can be restarted.

Also, refer to "A warning for a device is displayed" in "[4.2.1.3 Problem-handling \(FAQ\)](#)".

If the server node is in an [Error] or [Warning] state

1. On the global navigation tab, click **Server**.
2. On the **Server** pane, click **Access Path**.
3. Check the physical pathway of the access path with an [Error] state.
If no Error state device is on the route, check if a Fibre Channel cable along the route is disconnected. If you cannot identify the cause, contact a Fujitsu customer engineer.

On the server node where msdsm (the default Windows multipath driver, from Windows Server 2008 onward) is set, the server node enters the [Warning] state even if the single path (an access path that does not have a redundancy configuration) exists. This depends on the msdsm specification. Because the information for the access path that corresponds to the [Error] state disappears from the OS, this product cannot be distinguished from a single path. If access path is configured with the single path, disable msdsm.

Also, refer to "An Error in an access path is displayed" in "[4.2.1.3 Problem-handling \(FAQ\)](#)".

If an access path is in an [Error] state

If an access path of multipath disk control, follow the procedure below:

1. Obtaining path statuses

Check the current path configuration and status.

2. I/O stop related to a failed access path
3. Replacement of failed components (if necessary) or action for the Error
 - To replace a failed component, contact a Fujitsu customer engineer.
4. I/O restart of a stopped access path

For an access path not configured using Multipath Disk Control, a job performed with the target used volume is affected. Stop the job and take the appropriate action to resolve the fault. To replace a failed component, contact a Fujitsu customer engineer.

When replacing an HBA, refer to "[8.3.1.1 Host bus adapter \(HBA\) replacement of server node](#)".

Point

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In the case of an access path configured with multipath disk control, placing the access path offline causes the access path status to be [Error] and may display "Host Agent reports Access Path Status is degraded." as a message of access path failure.

In that case, put the access path back to online, and it returns to its former status.

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Actions to perform after component replacement

Execute [Reload Conf.] for the device whose component has been replaced to refresh the current device state.

When the device state is recovered by performing a replacement, the device state returns to and is displayed as the "Normal" state.

The state of NetApp FAS Series, V-Series and devices registered manually is not automatically recovered. On completion of device recovery, use the following procedure to return the device to the "Normal" state:

1. On the Action pane for the manually embedded device, click **Modify** to open the modify screen of the device.
2. Select "Normal" from the **Status** list on the modify screen and click **Modify**.

8.2 Replacing supported device

If any device registered on this product has been replaced, even executing [Reload Conf.] to the replaced device does not update to the new device information. Delete the replaced device once on the Web Console to add it again.

For procedures required by each device, see the description below.

8.2.1 Replacing a server node

When replacing a server node for each system, do it according to the operating system.

For Solaris OS

Before discovering a new server node on this product, delete all the access paths to the replaced server node to configure new access paths to the new server node.

For operating systems other than the Solaris OS

Use the following procedure to setting the access path:

1. Installing the Agent on the new server

For the new server assign a different IP address from that of the replaced server, then install the Agent.

If a new server cannot be configured with a different IP address from that of the replaced server, delete all the access paths to the replaced server before the new server is detected by this product and then specify new access paths for the new server.

2. Registering the new server to this product

1. On the global navigation tab, click **Server**.

2. On the Action pane, click **Register** under **Server**.
 3. Register the new server.
Check that the new server is displayed on the server overview screen.
3. Deleting the access path
 1. On the global navigation tab, click **Server**.
 2. On the **Server** pane, click **Access Path**.
 3. On the Main pane, select the checkbox of the access path set for the HBA on the replaced server.
 4. On the Action pane, click **Delete** under **Access Path**.
 5. Delete the access path.
On the access path overview screen, check that the access path set for the HBA on the replaced server has been deleted.
 4. Adding an access path
 1. On the global navigation tab, click **Server**.
 2. On the **Server** pane, click **Access Path**.
 3. On the Action pane, click **Add (ETERNUS)** under **Access Path**.
 4. Register the access path. For access path definition, select the following:
 - Port: Port assigned to the new server
 - HBA: HBA loaded in the new server
 - Affinity Group: Affinity Group assigned to the replaced server
 On the access path overview screen, check that the access path using the HBA installed on the new server has been created.
 5. Deleting the replaced server from this product
 1. On the global navigation tab, click **Server**.
 2. On the Main pane, select the checkbox of the replaced servers.
 3. On the Action pane, click **Delete** under **Server**.
 4. Delete the replaced server.
On the server overview screen, check that the replaced server has been deleted.

8.2.2 Replacing ETERNUS Disk storage system

When replacing ETERNUS Disk storage system for each device, use the following procedure to setting the access path.

1. Integrating the configuration information
 1. Ensure that the configuration definition of the new device matches that of the replaced device.
 2. For the new device assign a different IP address from that of the replaced device.
If the new device cannot be configured with a different IP address from that of the replaced device, delete all the access paths to the replaced device before the new device is detected by this product and then specify new access paths for the new device.
2. Registering the new device to this product
 1. On the global navigation tab, click **Storage**.
 2. On the Action pane, click **Register** under **Storage**.
 3. Register the new device.
On the disk storage system overview screen, check that the new device is displayed.

3. Registering the license to the new device

1. On the global navigation tab, click **Storage**.
2. On the Main pane, click the new device name.
3. On the Category pane, click **System**.
4. On the Main pane, select the target license checkbox.
5. On the Action pane, click **Register** under **License**.
6. Register the license.
On the license overview screen, check the license registration status.

4. Deleting the access path

1. On the global navigation tab, click **Server**.
2. On the **Server** pane, click **Access Path**.
3. On the Main pane, select the checkbox of the access path set for the replaced device.
4. On the Action pane, click **Delete** under **Access Path**.
5. Delete the access path.
On the access path overview screen, check that the access path set for the replaced device has been deleted.

5. Adding an access path

1. On the global navigation tab, click **Server**.
2. On the **Server** pane, click **Access Path**.
3. On the Action pane, click **Add (ETERNUS)** under **Access Path**.
4. Register the access path. For access path definition, select the following:
 - Port: Port assigned to the new device
 - HBA: HBA logical connection to the replaced device
 - Affinity Group: Affinity Group that matches the replaced device and to be assigned to the new deviceOn the access path overview screen, check that the access path using the port assigned to the new device has been created.

6. Deleting the license of the replaced device

1. On the global navigation tab, click **Storage**.
2. On the Main pane, check the replaced device name.
3. On the Category pane, click **System**.
4. On the Main pane, select the target license checkbox.
5. On the Action pane, click **Delete** under **License**.
6. Delete the license.
On the license overview screen, check the license registration status.

7. Deleting the replaced device from this product

1. On the global navigation tab, click **Storage**.
2. On the Main pane, select the replaced device checkbox.
3. On the Action pane, click **Delete** under **Storage**.
4. Delete the replaced device.
On the disk storage system overview screen, check that the replaced device has been deleted.

8. Subsequent operation

The server node must be restarted for server nodes that do not support hot swapping configuration changes after creation of the access path is complete.

On the server nodes that support hot swapping configuration changes, it is necessary to execute commands to perform the hot swapping configuration changes for OS and HBA drivers. For example, when the HBA driver is FUJITSU PCI Fibre Channel, `chgcctl` or `clchgfc` must be executed.

8.2.3 Replacing ETERNUS LT250/LT270

When replacing an entire ETERNUS LT250/LT270, use the following the procedure provided below to resetting the access path.

1. Integrating the configuration information
 1. Ensure that the configuration definition of the new tape library matches that of the replaced tape library.
 2. For the new tape library assign a different IP address from that of the replaced tape library.
2. Registering the new tape library to this product
 1. On the global navigation tab, click **Storage**.
 2. On the **Storage** pane, click **Tape Library**.
 3. On the Action pane, click **Discover** under **Tape Library**.
 4. Register the new tape library.
On the tape library overview screen, check that the new tape library is displayed.
3. Deleting zoning
 1. On the global navigation tab, click **Network**.
 2. On the Main pane, check the switch name.
 3. On the Category pane, click **Zoning**.
 4. On the Main pane, select the checkbox of the WWPN zoning of the replaced tape library.
 5. On the Action pane, click **Delete** under **Zoning**.
 6. Delete zoning.
On the zoning overview screen, check that the WWPN zoning of the replaced tape library has been deleted.

Note

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If you are not using "one to one" zoning, ensure that other security settings are not affected.
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4. Adding an access path
 1. On the global navigation tab, click **Server**.
 2. On the **Server** pane, click **Access Path**.
 3. On the Action pane, click **Add (Other)** under **Access Path**.
 4. Register the access path. For access path definition, select the following:
 - Port: Port assigned to the new tape library
 - HBA: HBA logical connection to the replaced tape libraryOn the zoning overview screen, check that the WWPN zoning of the new tape library has been created.
5. Deleting the replaced tape library from this product
 1. On the global navigation tab, click **Storage**.

2. On the **Storage** pane, click **Tape Library**.
 3. On the Main pane, select the replaced tape library checkbox.
 4. On the Action pane, click **Delete** under **Tape Library**.
 5. Delete the replaced tape library.
On the tape library overview screen, check that the replaced tape library has been deleted.
6. Subsequent operation

The server node must be restarted for server nodes that do not support hot swapping configuration changes after creation of the access path is complete.

On the server nodes that support hot swapping configuration changes, it is necessary to execute commands to perform the hot swapping configuration changes for OS and HBA drivers. For example, when the HBA driver is FUJITSU PCI Fibre Channel, chgfcctl or clchgfc must be executed.

8.2.4 Replacing Fibre Channel switch

This section explains the replacement procedure for Fibre Channel switch (hereafter, refer to as switch) registered in this product.

1. Stopping the performance monitoring of the switch to be replaced (when it is not a monitored device, this operation is unnecessary).
If threshold monitoring is also set, stop the threshold monitoring first and then stop the performance monitoring.
 1. On the global navigation tab, click **Network**.
 2. On the Main pane, click the switch to be replaced.
 3. On the Category pane, click **Performance**.
 4. On the **Performance** pane, click **Configuration**.
 5. On the Action pane, click **Stop** under **Performance**.
Check that the monitored status of the switch to be replaced is "Stop".
2. Deleting the replaced switch from this product
 1. On the global navigation tab, click **Network**.
 2. On the Main pane, select the checkbox of the replaced switches.
 3. On the Action pane, click **Delete** under **Switch**.
 4. Delete the replaced switch.
On the switch overview screen, check that the replaced switch is not displayed.
3. Physical replacement of old and new switches
For device replacement, contact a Fujitsu customer engineer and perform the replacement according to the maintenance procedure manual for the device.

When replacing a switch that is not connected in cascade, you may have to manually perform zoning settings again if the switch configuration information (configUpload file) has not been stored. After registering the new switch in this product, perform step 6, "Setting of switch zoning" below. Refer to the manual that comes with this device for the switch configuration information (configUpload file).
4. Registering a new switch to this product
 1. On the global navigation tab, click **Network**.
 2. On the Action pane, click **Discover** under **Switch**.
 3. Register the new switch.
On the switch overview screen, check that the new switch is displayed.

5. Refreshing the access path status

1. On the global navigation tab, click **Server**.
2. On the **Server** pane, click **Access Path**.
3. On the Action pane, click **Refresh** under **Access Path Status**.
On the access path overview screen, check that the access path status has been refreshed.

6. Setting the switch zoning

Since the zoning information specified for newly replaced switches that are managed by this product does not exist, access paths are displayed as definition inconsistency (Changed). Therefore, manually reset the zoning.

If no zoning is set for replaced switches or switches that are connected in a cascade, zoning resetting is not required.

If there is configuration information (the configUpload file), refer to the maintenance manual for the device.

Note

If the switch zoning information is as follows, the zoning access paths are not displayed regardless of pre- or post-switch replacement.

- Zoning other than HBA to CA access pathway managed by this product (HBA to HBA, CA to CA, HBA to UnknownFC, CA to UnknownFC, UnknownFC to UnknownFC)

Therefore, even after switch replacement, no Warning is displayed against the access path definition inconsistency such as between HBA and CA.

If zoning other than HBA to CA access pathway is configured with replaced switches, use Web Tools to configure the zoning for FC switch or Telnet command to FC switch.

7. Starting the performance monitoring of the new switch (when it is not a monitored device, this operation is unnecessary).

1. On the global navigation tab, click **Network**.
2. On the Main pane, click the target switch name.
3. On the Category pane, click **Performance**.
4. On the **Performance** pane, click **Configuration**.
5. On the Action pane, click **Start** under **Performance**.
Check that the monitored status of the new switch is "Monitoring".

Perform the threshold monitoring setting again once the threshold monitoring setting has been performed.

Note

If the configuration information has been customized, then check the content of the configuration settings file before starting performance monitoring.

Refer to "[A.10 Explanation of the Configuration Settings File](#)" for details.

8.2.5 Replacing manually embedded device

When replacing manually embedded device for each device, use the following the procedure provided below to resetting the access path.

1. Registering the new manually embedded device to this product.
 - In the case of manually embedded disk storage system:
 1. On the global navigation tab, click **Storage**.
 2. On the **Storage** pane, click **Disk Array(Manual)**.
 3. On the Action pane, click **Register** under **Storage**.

4. Register the new manually embedded disk storage system.
Check that the new manually embedded disk storage system is displayed on the manually embedded disk storage system overview screen.
- In the case of manually embedded tape library:
 1. On the global navigation tab, click **Storage**.
 2. On the **Storage** pane, click **Tape Library(Manual)**.
 3. On the Action pane, click **Register** under **Tape Library**.
 4. Register the new manually embedded tape library.
Check that the new manually embedded tape library is displayed on the manually embedded tape library overview screen.
2. Registering a post-replaced adapter (CA) of a manually embedded device.
 - For a manually embedded disk storage system:
 1. On the Main pane in the manually embedded disk storage system overview screen, click the target name.
 2. On the **Storage** pane, click **Port**.
 3. On the Action pane, click **Add** under **Port**.
 4. Registration of new port.
Check that the new port is displayed on the port overview screen of the manually embedded disk storage system.
 - For a manually embedded tape library:
 1. On the Main pane in the manually embedded tape library overview screen, click the target name.
 2. On the **Storage** pane, click **Port**.
 3. On the Action pane, click **Add** under **Port**.
 4. Register the new port.
Check that the new port is displayed on the port overview screen of the manually embedded tape library.
3. Deleting zoning
 1. On the global navigation tab, click **Network**.
 2. On the Main pane, click the target switch name.
 3. On the Category pane, click **Zoning**.
 4. On the Main pane, select the checkbox of the WWPN zoning of the replaced device.
 5. On the Action pane, click **Delete** under **Zoning**.
 6. Delete zoning.
On the zoning overview screen, check that the WWPN zoning of the replaced device has been deleted.

Note

If you are not using "one to one" zoning, ensure that other security settings are not affected.

4. Adding an access path
 1. On the global navigation tab, click **Server**.
 2. On the **Server** pane, click **Access Path**.
 3. On the Action pane, click **Add (Other)** under **Access Path**.
 4. Register the access path. For access path definition, select the following:
 - Port: Port assigned to the new manually embedded device
 - HBA: HBA logical connection to the new manually embedded device

On the zoning overview screen, check that the WWPN zoning of the new manually embedded device has been created.

5. Deleting the replaced device from this product

- For a manually embedded disk storage system:
 1. On the global navigation tab, click **Storage**.
 2. On the **Storage** pane, click **Disk Array(Manual)**.
 3. On the Main pane, select the checkbox of the manually embedded disk storage system that has been replaced.
 4. On the Action pane, click **Delete** under **Storage**.
 5. Delete the manually embedded disk storage system that has been replaced.
On the manually embedded disk storage system overview screen, check that the manually embedded disk storage system that has been replaced has been deleted.
- For a manually embedded tape library:
 1. On the global navigation tab, click **Storage**.
 2. On the **Storage** pane, click **Tape Library(Manual)**.
 3. On the Main pane, select the checkbox of the replaced manually embedded tape library.
 4. On the Action pane, click **Delete** under **Tape Library**.
 5. Delete the manually embedded tape library that has been replaced.
On the manually embedded tape library overview screen, check that the manually embedded tape library that has been replaced has been deleted.

6. Subsequent operation

After configuration, restart the server node if it does not support active configuration.

8.3 Replacing supported device components

The following explains how to replace the components of a supported device managed by this product.

For procedures required by each device, see the description below.

Type of Device	Replacing faulty components
Server node	<ul style="list-style-type: none"> - For HBA replacement: Perform "8.3.1 Replacing server node components". - For other component replacement: Execute [Reload Conf.] after component replacement.
ETERNUS Disk storage system	Execute [Reload Conf.] after component replacement. Also, refer to " 8.3.2 Replacing faulty components of ETERNUS Disk storage systems, ETERNUS LT250/LT270 ".
ETERNUS LT250/LT270	
Fibre Channel switch	Execute [Reload Conf.] after component replacement.
Manually embedded server node	<ul style="list-style-type: none"> - For HBA replacement: Perform "8.3.3 Replacing faulty components of a manually embedded device". - For other component replacement: Execute [Reload Conf.] after component replacement.
Manually embedded disk storage system Manually embedded tape library	<ul style="list-style-type: none"> - For Adapter (CA) replacement: Perform "8.3.3 Replacing faulty components of a manually embedded device". - For other component replacement: Execute [Reload Conf.] after component replacement.

8.3.1 Replacing server node components

This section describes the procedure required for HBA replacement on the server nodes registered on this product.



- Before executing access path inheritance, select **Network** from the global navigation tab on the Web Console, and verify that all Fibre Channel switches cascaded to the Fibre Channel switch related to access path setting are correctly recognized in the current status. Once an access path is changed in a state where a Fibre Channel switch is temporarily disconnected from the cascade connection, the old cascade connection cannot easily be recovered. In this event, execute `cfgClear` to delete the zoning information for the Fibre Channel temporarily disconnected from the cascade connection. This enables cascade reconnection.
- The basic conditions under which this product can recognize HBA replacement on a server node are as follows:
 - The agent has been installed in the server nodes.
 - HBA is exchanged on a server node same slot (physical port number).
 - The server node is registered in this product.
 - Access path is set to the pre-replaced HBA.
- When inheriting access path to HBA on this product, notice the following points:

- Zoning configuration should be one-to-one WWPN zoning.

In the environment using the following zoning configuration, access path inheritance is not allowed:

- Port zoning
- World Wide Port Name (WWPN) zone setting not being one-to-one.
- The zoning configuration of the following devices is not allowed to be inherited:
 - Tape library unit
 - Other than ETERNUS Disk storage system
- The host number of host registration information is not allowed to be inherited. Host name is allowed to be inherited.
- If inheritance is done toward the access paths for which no zoning is configured, skip zoning creation and perform only host registration and host affinity configuration.
- For access path inheritance in environments that use the FC routing functionality, the settings for the LSAN zone that is required in the FC routing functionality cannot be modified using this product.

Before using access path inheritance, manually modify the required LSAN zone settings on the server nodes, Fibre Channel switches, and storage devices.

- For VMware Infrastructure 3 Version 3.5 or later, VMware vSphere 4 or later or VMware ESXi 3.5 or later, perform either of the following steps after access path inheritance:
 - Reboot the VM host
 - For the access path inheritance-done HBA, execute Rescan from the VMware Infrastructure Client.

Refer to "Access path management" in "Configuration management" in "[4.1.8.2 VMware Infrastructure 3 Version 3.5 \(or later\), VMware vSphere 4 \(or later\) or VMware ESXi 3.5 \(or later\)](#)" for information on the operation of the VMware Infrastructure Client.

8.3.1.1 Host bus adapter (HBA) replacement of server node

When replacing HBA on a server node, do it according to the operating system.

8.3.1.1.1 [For Solaris OS server node] Host bus adapter (HBA) replacement

When replacing HBA on a Solaris server node, take the following procedure.

HBA replacement with server node shut down

For a server node that does not support the hot system replacement function, turn off the server node in order to replace the HBA. Do not restart or shut down the server node in reconfigure mode during replacement. (This is because the special file name is changed if the reboot -r command, boot -r command, or other such command is executed.)

1. Shutting down the server node.

Confirm that the /reconfigure file does not exist, and shut down the device.

```
# ls /reconfigure
/reconfigure: No such file or directory
```

If the /reconfigure file exists, take the following procedure:

- a. To delete the "reconfigure" file, enter the following command.

```
# rm /reconfigure
```

- b. Execute the ls command to re-check the presence of the /reconfigure file.

- c. Do not reconfigure but shut down.

```
# /usr/sbin/shutdown -y -i0 -g0
```

Re-create the/reconfigure file after replacement operation. Afterward, restart the server node.

2. Replacing the HBA

To replace a failed component, contact a Fujitsu customer engineer.

3. Activating the server node

Activate the server node.

No access path, however, is recovered here. This is because the zoning is based on old HBA information is defined on the storage system and Fibre Channel switch.

4. Execute [Reload Conf.] for the server node from this product.

5. Inheriting access paths (resetting security)

Follow the process of "[8.3.1.2 Access path inheritance after HBA replacement](#)" from this product, and define the zoning setting so that the method of access based on the new HBA information can be the same as that for the previous access path of the storage system and Fibre Channel switch.

6. Reactivating the server node

Reboot the server node without reconfiguration (reboot -r, boot -r, etc. are prohibited.)

```
# /usr/sbin/shutdown -i6
```

The access paths and the paths of Multipath Disk Control are recovered.

HBA replacement without shutting down server node

On the server node that supports the hot system replacement function, HBA replacement is allowed without shutting down the server node. Refer to the appropriate device manuals for information on the hot system replacement.

1. HBA replacement without shutting the server node

Refer to the device manual to replace HBA without shutting the server node.

To replace a failed component, contact a Fujitsu customer engineer.

2. Execute [Reload Conf.] for the server node from this product.

3. Inheriting access paths (resetting security)

Follow the process of "[8.3.1.2 Access path inheritance after HBA replacement](#)" from this product, and define the zoning setting so that the method of access based on the new HBA information can be the same as that for the previous access path of the storage system and Fibre Channel switch.

8.3.1.1.2 [For operating systems other than the Solaris OS] Host bus adapter (HBA) replacement

When replacing HBA on a other than Solaris server node, take the following procedure.

HBA replacement with server node shut down

For a server node that does not support the hot system replacement function, turn off the server node in order to replace the HBA.

1. Shutting down the server node
2. Replacing the HBA
3. Starting the server node

No access path is recovered here. This is because zoning based on old HBA information is defined on the storage and Fibre Channel switch.

4. Execute [Reload Conf.] for the server node from this product.
5. Inheriting access paths (resetting security)

Follow the process of "[8.3.1.2 Access path inheritance after HBA replacement](#)" from this product, and define the zoning setting so that the method of access based on the new HBA information can be the same as that for the previous access path of the storage system and Fibre Channel switch.

6. Reactivating the server node

HBA replacement without shutting down server node

On the server node that supports the hot system replacement function, HBA replacement is allowed without shutting down the server node. Refer to the appropriate device manuals for information on the hot system replacement.

1. Replacing the HBA without shutting down the server node

Refer to the device manual to replace HBA without shutting the server node.

To replace a failed component, contact a Fujitsu customer engineer.

2. Execute [Reload Conf.] for the server node from this product.
3. Inheriting access paths (resetting security)

Follow the process of "[8.3.1.2 Access path inheritance after HBA replacement](#)" from this product, and define the zoning setting so that the method of access based on the new HBA information can be the same as that for the previous access path of the storage system and Fibre Channel switch.

8.3.1.2 Access path inheritance after HBA replacement

This product describes the procedure for HBA access path inheritance. Perform the procedure according to the state of the post-replaced HBA.



Note

- If the HBA in a Solaris OS is replaced, the HBA state changes to "Changed" normally.

This product refers to the special file (`/dev/rdisk/cXtXdXsX`) of a device going through the replaced HBA (LUN) to determine the HBA state. Therefore, if after HBA replacement, the relevant special file cannot be referred to because it was deleted, the HBA state does not change to "Changed".

- If an HBA is hot swapped in a Linux OS, even replacing the HBA using the same slot does not change the HBA state to "Changed".

8.3.1.2.1 Post-replaced HBA state is "Changed"

In this product, after HBA replacement on an agent installed server node, if [Reload Conf.] is executed to the server node, it recognizes the HBA replacement and changes the HBA state displayed on the server detail screen of the Main pane to "Changed". This is detected when an HBA that has a different WWPN is installed in the same slot (physical port number) of the host.

The procedure for access path inheritance at this time is provided below.



Before performing the procedures below, refer to the Notes in "8.3.1 Replacing server node components".

1. Checking the inherited HBA state
 1. On the global navigation tab, click **Server**.
 2. On the Main pane, check the server.
 3. On the Main pane, confirm that the HBA state is "Changed".
2. Inheriting access path
 1. On the global navigation tab, click **Server**.
 2. On the Main pane, click the target server name.
 3. On the Main pane, select the checkbox of the HBA whose state is "Changed".
 4. On the Action pane, click **Inherit** under **Access Path**.
3. Checking the access path inheritance
 1. On the global navigation tab, click **Server**.
 2. On the **Server** pane, click **Access Path**.
 3. Using the HBA of replacement destination, check if the access path has been set.

8.3.1.2.2 Post-replaced HBA state is "Unknown"

This product may not be able to set the "Changed" state for an HBA. According to the following status, execute this procedure.

HBA replacement on manually embedded server node

Refer to "8.3.3 Replacing faulty components of a manually embedded device".

In cases other than the above

Change access path by following procedure provided below.

If the device requires server node-side settings, the settings must be defined manually.



Before performing the procedures below, refer to the Notes in "8.3.1 Replacing server node components".

1. Detecting the replaced destination HBA
 - Reload the configuration of the target server to detect the replaced destination HBA.
 1. On the global navigation tab, click **Server**.

2. On the Main pane, select the target server checkbox.
 3. On the Action pane, click **Reload Conf.** under **Server**.
2. Checking the replaced destination HBA
 1. On the global navigation tab, click **Server**.
 2. On the Main pane, click the server name.
 3. On the Main pane, check that the HBAs of replacement source and replacement destination are displayed.
 3. Changing the access path
 1. On the global navigation tab, click **Server**.
 2. On the **Server** pane, click **Access Path**.
 3. On the Main pane, select the changed target access path checkbox.
 4. On the Action pane, click **Modify** under **Access Path**.
 5. Change the setting of access path.
 4. Checking the access path changing
 1. On the global navigation tab, click **Server**.
 2. On the **Server** pane, click **Access Path**.
 3. Using the replaced destination HBA, check whether access path has been set.
 5. Subsequent operation

After configuration, restart the server node if it does not support active configuration.

8.3.2 Replacing faulty components of ETERNUS Disk storage systems, ETERNUS LT250/LT270

ETERNUS Disk storage systems, ETERNUS LT250/LT270 do not require the access path inheritance because the WWPN is not changed for the replacement of an adapter (CA) etc.

8.3.3 Replacing faulty components of a manually embedded device

If WWPN is changed because of a faulty component of a manually embedded device such as an HBA or adapter (CA) is replaced, the replacement device will not be automatically detected by this product. Perform the following procedures to set the access path after components of the device are exchanged.

If the HBA of manually embedded server node is replaced

1. Detecting the replaced destination HBA

Adding the HBA to the target server.

 1. On the global navigation tab, click **Server**.
 2. On the Main pane, click the target server name.
 3. On the Action pane, click **Add** under **HBA**.
 4. Register the HBA of replacement destination.
2. Checking the HBA of replacement destination
 1. On the global navigation tab, click **Server**.
 2. On the Main pane, click the target server name.

3. On the Main pane, check that the HBAs of pre-replacement and replacement destination are displayed.
3. Changing the access path
 1. On the global navigation tab, click **Server**.
 2. On the **Server** pane, click **Access Path**.
 3. On the Main pane, select the target access path checkbox.
 4. On the Action pane, click **Modify** under **Access Path**.
 5. Change the access path settings.
4. Checking the access path changes
 1. On the global navigation tab, click **Server**.
 2. On the **Server** pane, click **Access Path**.
 3. For the replaced destination HBA, check if the access path has been set.
5. Deleting the pre-replacement HBA
 1. On the global navigation tab, click **Server**.
 2. On the Main pane, click the target server name.
 3. On the Main pane, select the checkbox of the pre-replacement HBA.
 4. On the Action pane, click **Delete** under **HBA**.
 5. Delete the pre-replacement HBA.
6. Subsequent operation

After configuration change, restart any server node if it does not support the hot system replacement function.

If the adapter (CA) of manually embedded disk storage system and manually embedded tape library is replaced

1. Registering the post-replaced adapter (CA) of manually embedded device
 - For a manually embedded disk storage system:
 1. On the manually embedded disk storage system overview screen, click the manually embedded disk storage system name.
 2. On the **Storage** pane, click **Port**.
 3. On the Action pane, click **Add** under **Port**.
 4. Register the new port.
Check that the new port is displayed on the port overview screen of the manually embedded disk storage system.
 - For a manually embedded tape library system:
 1. On the manually embedded tape library system overview screen, click the manually embedded tape library system name.
 2. On the **Storage** pane, click **Port**.
 3. On the Action pane, click **Add** under **Port**.
 4. Register the new port.
Check that the new port is displayed on the port overview screen of the manually embedded tape library.
2. Deleting zoning
 1. On the global navigation tab, click **Network**.
 2. On the Main pane, click the switch name.
 3. On the Category pane, click **Zoning**.

4. On the Main pane, select the checkbox of the WWPN zoning of the manually embedded device.
5. On the Action pane, click **Delete** under **Zoning**.
6. Delete zoning.
On the zoning overview screen, check that the WWPN zoning of the manually embedded device has been deleted.

Note

If you are not using "one to one" zoning, ensure that other security settings are not affected.

3. Adding an access path

1. On the global navigation tab, click **Server**.
2. On the **Server** pane, click **Access Path**.
3. On the Action pane, click **Add (Other)** under **Access Path**.
4. Register the access path. For access path definition, select the following:
 - Port: Port assigned to the new manually embedded device
 - HBA: HBA logical connection to the manually embedded device

On the zoning overview screen, check that the WWPN zoning of the new manually embedded device has been created.

4. Deleting the pre-replacement adapter (CA) of manually embedded device

- For a manually embedded disk storage system:
 1. On the manually embedded disk storage system overview screen, click the manually embedded disk storage system name.
 2. On the **Storage** pane, click **Port**.
 3. On the Main pane, select the checkbox of the pre-replacement port.
 4. On the Action pane, click **Delete** under **Port**.
 5. Delete the replaced port.
Check that the new manually embedded tape library is not displayed on the manually embedded tape library overview screen.
- For a manually embedded tape library:
 1. On the manually embedded tape library system overview screen, click the manually embedded tape library system name.
 2. On the **Storage** pane, click **Port**.
 3. On the Main pane, select the checkbox of the pre-replacement port.
 4. On the Action pane, click **Delete** under **Port**.
 5. Delete the replaced port.
Check that the replaced port is not displayed on the port overview screen.

5. Subsequent operation

After configuration, restart the server node if it does not support active configuration.

8.4 Adding supported device components

8.4.1 Adding ETERNUS LT270 S2 extended cabinet

When adding an extended cabinet for ETERNUS LT270 S2, if a cabinet-through rail is installed, remove the drive in the base cabinet and install it in the extended cabinet. Use the following procedure to change the port of the drive and reconfigure the access path:

1. Deleting zoning

1. On the global navigation tab, click **Network**.
2. On the Main pane, click the switch name.
3. On the Category pane, click **Zoning**.
4. On the Main pane, select the checkbox of the WWPN zoning of the removed drive.
5. On the Action pane, click **Delete** under **Zoning**.
6. Delete zoning.
On the zoning overview screen, check that the WWPN zoning of the removed drive has been deleted.



Note

.....
If you are not using "one to one" zoning, ensure that other security settings are not affected.
.....

2. Deleting the port of the drive

1. On the global navigation tab, click **Storage**.
2. On the **Storage** pane, click **Tape Library(Manual)**.
The registered tape libraries are displayed on the Main pane.
3. On the Main pane, click the target tape library name.
4. On the Category pane, click **Device**.
The devices registered on the tape library are displayed on the Main pane.
5. On the Main pane, click the target device name.
The details of the device are displayed on the Main pane.
6. On the Main pane, select the checkbox of the port of the target device.
7. On the Action pane, click **Delete** under **Port**.
The information confirmation screen is displayed.
8. Confirm the information, and then click **Delete**.

3. Adding an extended cabinet

Add an extended cabinet for ETERNUS LT270 S2.

4. Adding a port of the drive

1. On the global navigation tab, click **Storage**.
2. On the **Storage** pane, click **Tape Library(Manual)**.
The registered tape libraries are displayed on the Main pane.
3. On the Main pane, click the target tape library name.
4. On the Category pane, click **Device**.
The devices registered on the tape library are displayed on the Main pane.
5. On the Main pane, click the target device name.
The details of the device are displayed on the Main pane.
6. On the Action pane, click **Add** under **Port**.
7. Enter the necessary information, and then click **Next**.
The information confirmation screen is displayed.
8. Confirm the information, and then click **Add**.



.....
The interface type that allows ports to be added is only FC.
.....

5. Adding an access path

1. On the global navigation tab, click **Server**.
2. On the **Server** pane, click **Access Path**.
3. On the Action pane, click **Add (Other)** under **Access Path**.
4. Register the access path. For access path definition, select the following:
 - HBA: Logically connected to a replaced device.
 - Port: to the drive whose installed position was changed.
5. Confirm the information on the information confirmation screen, and then click **Add**.

6. Subsequent operation

After configuration, restart the server node if it does not support active configuration.

Chapter 9 Maintenance of the Administrative Environment

This chapter explains how to maintain databases, and it describes the appropriate action to take for troubleshooting.

9.1 Maintenance of Manager

9.1.1 Maintenance of manager

9.1.1.1 Collecting data for troubleshooting

If any problem occurs in a system that uses this software, collect troubleshooting information according to "[B.1 Troubleshooting information](#)".

9.1.1.2 Backup of Manager

Back up (save) the environment for the Storage Cruiser's manager if an error has occurred in the Management Server.

All of the tasks for backup of Manager are performed in the Management Server.

9.1.1.2.1 Backup of Solaris OS Manager

Follow the procedure below to save the environment for the Storage Cruiser's manager.



Information

About description in the procedure

- "\$BAK_DIR" signifies the backup destination directory.

1. Stop the ETERNUS SF Manager Tomcat Service.

Execute the following shell script to stop the service.

```
/opt/FJSVesfcm/bin/stop-webservice.sh
```

2. Create the backup data.

Create the directory for the backup data.

```
mkdir -p $BAK_DIR/Common
```

Execute the following command to create the backup data. Specify the default value 15432 to *<port-number>*, however, if you have changed the port number, specify the changed port number to *<port-number>*. The backup data is then created using the file name designated in *<filename>*.

```
/opt/FJSVesfcm/postgres/bin/pg_dump -U esfpostgres -C --attribute-inserts  
-p <port-number> -f $BAK_DIR/Common/<filename> esfdb
```

A prompt is displayed with the server awaiting input. Input the following keyword.

```
master01!
```

- Execute the following shell script to stop ETERNUS SF Manager services.

```
/opt/FJSVesfcm/bin/stopesf.sh
```

Note

Upon executing the shell script, multiple messages stating that the ETERNUS SF Manager Tomcat has already been stopped will be displayed. These messages do not pose a problem and can be ignored.

- Backup the device management information.

In the normal backup operation, execute "Backup the device management information".

If upgrade from a previous version, execute "Upgrade from a previous version".

- Backup the device management information

Create the directory for the backup data.

```
mkdir -p $BAK_DIR/var/opt/FJSVssmgr/current/opencimom/logr
```

Copy the files to the backup location.

```
cp -Rp /var/opt/FJSVssmgr/current/opencimom/logr/* $BAK_DIR/var/opt/FJSVssmgr/current/opencimom/logr/
```

- Upgrade from a previous version

cimbackup.sh is used for backing up the device management information. Refer to "[Appendix D Migrating from the Previous Version](#)" for further information of cimbackup.sh.

Create the directory for the backup data.

```
# mkdir -p $BAK_DIR/logr
```

Move to a directory that cimbackup.sh is stored, and execute cimbackup.sh.

```
# ./cimbackup.sh $BAK_DIR/logr
```

- Back up the essential file.

Backup is not required if the files do not exist.

Create the directory for the backup data.

```
mkdir -p $BAK_DIR/var/opt/FJSVssmgr/current
```

Copy the file to the backup location.

```
cp -p /var/opt/FJSVssmgr/current/systemevent.csv $BAK_DIR/var/opt/FJSVssmgr/current/
```

- Back up the files related to the performance management function.

This step can be skipped if you are not using the performance management function. Backup is not required if there are no subdirectories or files.

Note

If a pile of files related to the performance management function exists, calculate the backup time according to the amount of files.

Create the directories for the backup data.

```
mkdir -p $BAK_DIR/etc/opt/FJSVssmgr/current
mkdir -p $BAK_DIR/var/opt/FJSVssmgr/current/perf
```

Copy the subdirectories and files to the backup locations.

```
cp -p /etc/opt/FJSVssmgr/current/perf.conf $BAK_DIR/etc/opt/FJSVssmgr/current/  
cp -Rp /var/opt/FJSVssmgr/current/perf/* $BAK_DIR/var/opt/FJSVssmgr/current/perf/
```

7. Back up the other files which can be customized.

It is unnecessary to back up the files or the directories which are not existed.

Create the directories for the backup data.

```
mkdir -p $BAK_DIR/etc/opt/FJSVssmgr/current  
mkdir -p $BAK_DIR/etc/opt/FJSVssmgr/current/eventmail
```

Copy the subdirectories and files to the backup locations.

```
# cp -p /etc/opt/FJSVssmgr/current/sanma.conf $BAK_DIR/etc/opt/FJSVssmgr/current/  
# cp -p /etc/opt/FJSVssmgr/current/ssmgr.conf $BAK_DIR/etc/opt/FJSVssmgr/current/  
# cp -p /etc/opt/FJSVssmgr/current/trapop.sh $BAK_DIR/etc/opt/FJSVssmgr/current/  
# cp -p /etc/opt/FJSVssmgr/current/traprm.sh $BAK_DIR/etc/opt/FJSVssmgr/current/  
# cp -Rp /etc/opt/FJSVssmgr/current/eventmail/* $BAK_DIR/etc/opt/FJSVssmgr/current/eventmail/
```

8. Back up the SNMP Trap XML definition files.

This step can be skipped if you are not customizing the SNMP Trap XML definition files.

Below is an example for if the SNMP Trap XML definition file 1_3_6_1_1588_2_1_1_1.xml has been customized. As shown in this example, back up each customized file one at a time.

Create the directory for the backup data.

```
mkdir -p $BAK_DIR/etc/opt/FJSVssmgr/current/snmpth
```

Copy the file to the backup location.

```
# cp -p /etc/opt/FJSVssmgr/current/snmpth/1_3_6_1_1588_2_1_1_1.xml $BAK_DIR/etc/opt/FJSVssmgr/  
current/snmpth/
```

9. Back up the device polling setting files.

This step can be skipped if you are not customizing the device polling setting files.

Below is an example for if the device polling setting file, DP_config.xml, has been customized. As shown in this example, back up each customized file one at a time.

Create the directory for the backup data.

```
# mkdir -p $BAK_DIR/etc/opt/FJSVssmgr/current/devicepolling
```

Copy the file to the backup location.

```
# cp -p /etc/opt/FJSVssmgr/current/devicepolling/DP_config.xml $BAK_DIR/etc/opt/FJSVssmgr/  
current/devicepolling/
```

10. Back up the polling service setting file.

This step can be skipped if you are not customizing the polling service setting file.

If you have customized the polling service setting file pollingService.xml, back up this file using the step shown below.

Create the directory for the backup data.

```
# mkdir -p $BAK_DIR/etc/opt/FJSVssmgr/current/polling
```

Copy the file to the backup location.

```
# cp -p /etc/opt/FJSVssmgr/current/polling/pollingService.xml $BAK_DIR/etc/opt/FJSVssmgr/  
current/polling/
```

11. Save the files related to copy group and copy pair definitions.

Perform this step only if you are using the AdvancedCopy function.

Create the directories for the backup data.

```
mkdir -p $BAK_DIR/CCM/etc
mkdir -p $BAK_DIR/CCM/etc/db
mkdir -p $BAK_DIR/CCM/etc/db/cg
mkdir -p $BAK_DIR/CCM/etc/prop
mkdir -p $BAK_DIR/CCM/var/micc/database
```

Copy the subdirectories and files to the backup locations.

```
cp -p /etc/opt/FJSVccm/db/eternus.xml $BAK_DIR/CCM/etc/db
cp -p /var/opt/FJSVccm/micc/database/DeviceRegList.xml $BAK_DIR/CCM/var/micc/database
cp -p /etc/opt/FJSVccm/prop/user.properties $BAK_DIR/CCM/etc/prop
cp -p /etc/opt/FJSVccm/acc/etc/stxc.alias $BAK_DIR/CCM/etc
cp -p /etc/opt/FJSVccm/acc/etc/stxc_ext.alias $BAK_DIR/CCM/etc
cp -p /etc/opt/FJSVccm/acc/etc/stxcvolinf $BAK_DIR/CCM/etc
cp -Rp /etc/opt/FJSVccm/db/cg/* $BAK_DIR/CCM/etc/db/cg
```

12. Back up the license management database.

Create the directory for the backup data.

```
mkdir -p $BAK_DIR/LM
```

Execute the following command. The backup data is created using the file name specified in *<filename>*.

```
/opt/FJSVesflm/bin/esflm backup $BAK_DIR/LM/<filename>
```

13. Back up the Optimization Option environment. (For Optimization Option only)

Create the directory for the backup data.

```
mkdir -p $BAK_DIR/etc/opt/FJSVssast/data/policy
mkdir -p $BAK_DIR/etc/opt/FJSVssast/data/pool
mkdir -p $BAK_DIR/var/opt/FJSVssast/data/perf
```

Copy the subdirectories and files to the backup locations.

```
cp -p /etc/opt/FJSVssast/data/policy/TierPolicy.xml $BAK_DIR/etc/opt/FJSVssast/data/policy/
cp -p /etc/opt/FJSVssast/data/pool/* $BAK_DIR/etc/opt/FJSVssast/data/pool/
cp -Rp /var/opt/FJSVssast/data/perf/* $BAK_DIR/var/opt/FJSVssast/data/perf/
```

14. Execute the following shell script to start the ETERNUS SF Manager services.

```
/opt/FJSVesfcm/bin/startesf.sh
```

9.1.1.2.2 Backup of Solaris OS Manager (cluster environment)

For cluster environment, follow the procedure below to save the environment for the Storage Cruiser's manager.

1. Stop all cluster services which the Manager belongs to.

Refer to "Cluster transaction and local transaction" in the *ETERNUS SF Cluster Environment Setup Guide* for details of cluster transaction.

2. Mount the shared disk on the primary node.

3. Start the ETERNUS SF Manager Postgres service.

Execute the following command to start the ETERNUS SF Manager Postgres service:

```
/etc/init.d/startSFmanager start-postgres
```

4. Perform step 2 and steps 4 to 13 of "9.1.1.2.1 Backup of Solaris OS Manager" on the primary node.
5. Stop the ETERNUS SF Manager Postgres service.
Execute the following command to stop the ETERNUS SF Manager Postgres service:

```
/etc/init.d/startSFmanager stop-postgres
```

6. Unmount the shared disk mounted in step 2.
7. Start all cluster transactions which the Manager belongs to.

9.1.1.2.3 Backup of Linux Manager

Since the procedure for backup of the Linux version of Manager is identical to that for backup of the Solaris OS version, refer to "9.1.1.2.1 Backup of Solaris OS Manager" for performing this operation.

9.1.1.2.4 Back up of Linux Manager (cluster environment)

Since the procedure for backup of the Linux version of Manager is identical to that for backup of the Solaris OS versions in cluster environment, refer to "9.1.1.2.2 Backup of Solaris OS Manager (cluster environment)" for performing this operation.

9.1.1.2.5 Backup of Windows Manager

Follow the procedure below to save the environment for the Storage Cruiser's manager.



Information

About description in the procedure

- \$BAK_DIR means the backup destination directory.
- \$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.
- \$ENV_DIR means "Environment Directory" specified at the ETERNUS SF Manager installation.
- \$TMP_DIR means "Work Directory" specified at the ETERNUS SF Manager installation.

1. Stop the ETERNUS SF Manager Tomcat Service.

Open Service Control Manager and stop the following service.

- ETERNUS SF Manager Tomcat Service

2. Create the backup data.

Create the following directory for the backup data in Explorer or a similar program.

- \$BAK_DIR\Common

Execute the following command to create the backup data. Specify the default value 15432 to *<port-number>*, however, if you have changed the port number, specify the changed port number to *<port-number>*. The backup data will be created with the name specified in *<filename>*.

```
$INS_DIR\Common\sys\postgres\bin\pg_dump -U esfpostgres -C --attribute-inserts
-p <port-number> -f $BAK_DIR\Common\<filename> esfdb
```

A prompt is displayed, with the server awaiting input. Input the following keyword.

```
master01!
```

- Execute the following batch to stop the ETERNUS SF Manager services.

```
$INS_DIR\Common\bin\Stop_ESFservice.bat
```

Note

Upon executing the batch, multiple messages stating that the ETERNUS SF Manager Tomcat Service has already been stopped will be displayed. These messages do not pose a problem and can be ignored.

- Back up the device management information.

In the normal backup operation, execute "Backup the device management information".

If upgrade from a previous version, execute "Upgrade from a previous version".

- Backup the device management information

Create the following directory for the backup data using Explorer or a similar program.

- \$BAK_DIR\ESC\Manager\var\opt\FJSVssmgr\current\opencimom\logr

Using Explorer or a similar program, copy the files belonging to the following directory to the backup location.

Copy Source Directory	Copy Destination Directory
\$TMP_DIR\ESC\Manager\var\opt\FJSVssmgr\current\opencimom\logr	\$BAK_DIR\ESC\Manager\var\opt\FJSVssmgr\current\opencimom\logr

- Upgrade from a previous version

cimbackup.bat is used for backing up the device management information. Refer to "[Appendix D Migrating from the Previous Version](#)" for further information of cimbackup.bat.

Create the directory for the backup data as follows by using Explore.

- \$BAK_DIR\logr

In the command prompt, move to a directory that cimbackup.bat is stored, and then execute cimbackup.bat.

```
cimbackup.bat "$BAK_DIR\logr"
```

- Back up the essential file.

Create the following directory for the backup data in Explorer or a similar program.

- \$BAK_DIR\ESC\Manager\var\opt\FJSVssmgr\current

Using Explorer or a similar program, copy the following file to the backup location.

Copy Source File	Copy Destination Directory
\$TMP_DIR\ESC\Manager\var\opt\FJSVssmgr\current\systemevent.csv	\$BAK_DIR\ESC\Manager\var\opt\FJSVssmgr\current

- Back up the files related to the performance management function.

This step can be skipped if you are not using the performance management function.

This backup is also not required if there are no subdirectories or files.

Note

If a pile of files related to the performance management function exists, calculate the backup time according to the amount of files.

Create the following directories for the backup data in Explorer or a similar program.

- \$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current
- \$BAK_DIR\ESC\Manager\var\opt\FJSVssmgr\current\perf

Using Explorer or a similar program, copy the following file to the backup location.

Copy Source File	Copy Destination Directory
\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\perf.conf	\$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current

Using Explorer or a similar program, copy the subdirectories and files belonging to the following directories to their backup locations.

Copy Source Directory	Copy Destination Directory
\$TMP_DIR\ESC\Manager\var\opt\FJSVssmgr\current\perf	\$BAK_DIR\ESC\Manager\var\opt\FJSVssmgr\current\perf

7. Back up the other files which can be customized.

It is unnecessary to back up the files or the directories which are not existed.

Create the following backup directories in Explorer or a similar program.

- \$BAK_DIR\ESC\Manager\opt\FJSVssmgr\bin
- \$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current
- \$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\eventmail

Using Explorer or a similar program, copy the following files to their backup locations.

Copy Source File	Copy Destination Directory
\$INS_DIR\ESC\Manager\opt\FJSVssmgr\bin\manager.ini	\$BAK_DIR\ESC\Manager\opt\FJSVssmgr\bin
\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\sanma.conf	\$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current
\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\ssmgr.conf	
\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\trapop.bat	
\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\traprm.bat	

Using Explorer or a similar program, copy the subdirectories and files belonging to the following directory to their backup location.

Copy Source Directory	Copy Destination Directory
\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\eventmail	\$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\eventmail

8. Back up the SNMP Trap XML definition files.

This step can be skipped if you are not customizing the SNMP Trap XML definition files.

Below is an example for if the SNMP Trap XML definition file 1_3_6_1_1588_2_1_1_1.xml is being customized. As in this example, back up each file one at a time.

Create the following backup directory in Explorer or a similar program.

- \$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\snmpth

Using Explorer or a similar program, copy the following file to its backup location.

Copy Source File	Copy Destination Directory
\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\smpth\1_3_6_1_1588_2_1_1_1.xml	\$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\smpth

9. Back up the device polling setting files.

This step can be skipped if you are not customizing the device polling setting files.

Below is an example for if the device polling setting file DP_config.xml is being customized. As in this example, back up each file one at a time.

Create the following backup directory in Explorer or a similar program.

- \$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\devicepolling

Using Explorer or a similar program, copy the following file to its backup location.

Copy Source File	Copy Destination Directory
\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\devicepolling\DP_config.xml	\$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\devicepolling

10. Back up the polling service setting file.

This step can be skipped if you are not customizing the polling service setting file.

If customizing the polling service setting file pollingService.xml, follow the step below to back it up.

Create the following backup directory in Explorer or a similar program.

- \$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\polling

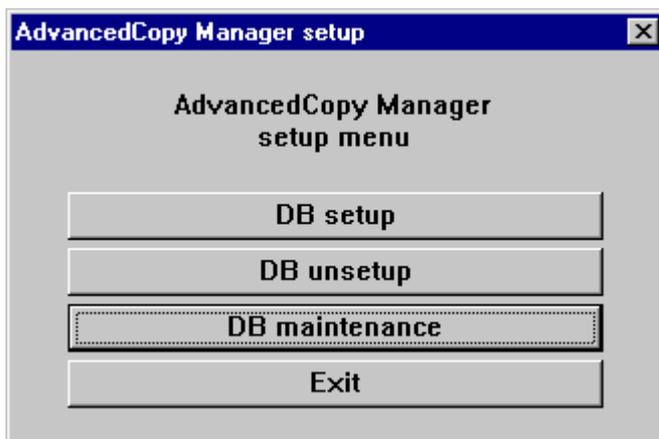
Using Explorer or a similar program, copy the following file to its backup location.

Copy Source File	Copy Destination Directory
\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\polling\pollingService.xml	\$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\polling

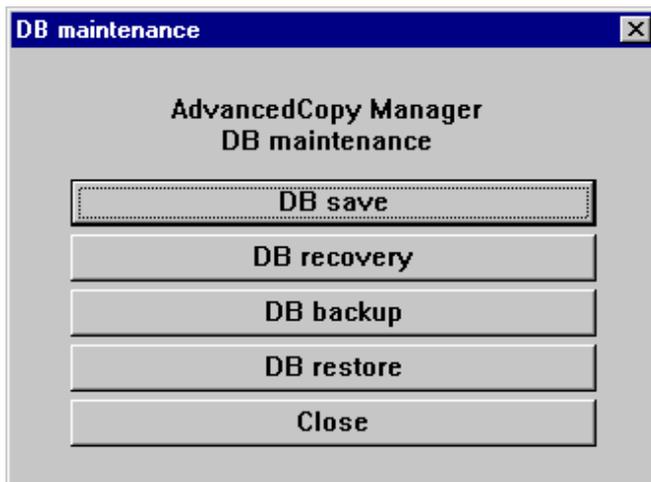
11. Back up the database.

Follow the procedure below to back up the database.

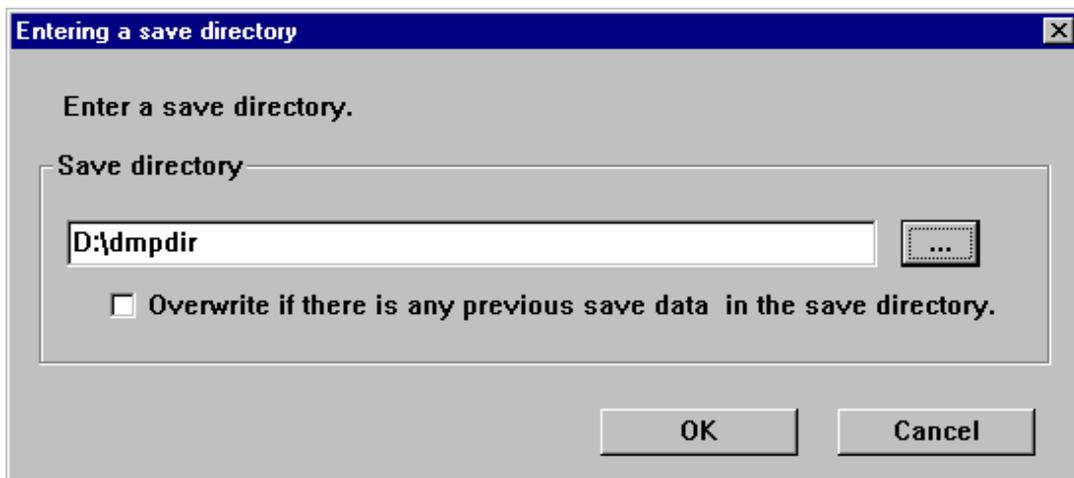
1. From the Start button, select [Programs]-[ETERNUS SF Manager]-[DB Setup Tools].
2. Once the screen shown below is displayed, click the [DB maintenance] button.



3. Once the DB Maintenance screen shown below is displayed, click the [DB save] button.



4. Once the input screen for the save destination directory is displayed, designate the backup destination directory and click the [OK] button. If overwriting to a directory to which data was already saved, check the checkbox for "Overwrite if backup data already exists in the backup destination."



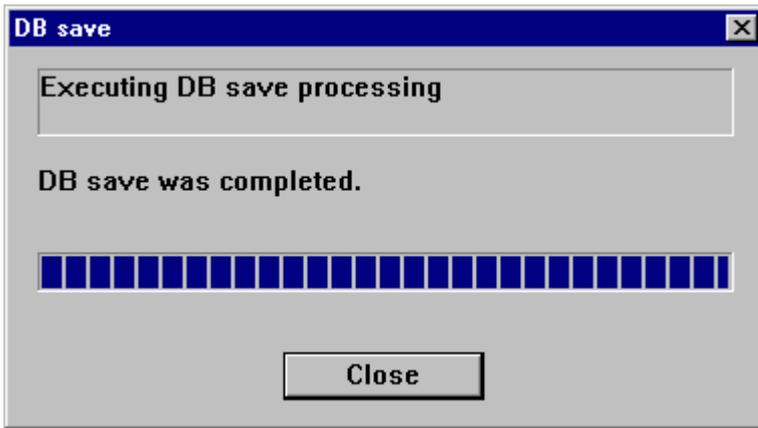
 **Note**

It is necessary to create the backup destination directory beforehand.

5. Once the confirmation screen for the processing is displayed, check that there are no mistakes in the input details and click the [Start] button.



6. When the DB save is complete, the following completion screen will be displayed. Click the [Close] button.



 **Information**

It is also possible to back up the database using commands.

Refer to "stgdbdmp (Database save command)" in the *ETERNUS SF AdvancedCopy Manager Operation Guide* for details on how to perform the operation with commands.

12. Back up the registry.

Create the following backup directory in Explorer or a similar program.

- \$BAK_DIR\ACM\etc

Using Explorer or a similar program, copy the following files to the backup location.

Copy Source File	Copy Destination Directory
\$ENV_DIR\ACM\etc\swnode.ini	\$BAK_DIR\ACM\etc
\$ENV_DIR\ACM\etc\device.ini	

13. Save the files related to copy group and copy pair definitions.

Perform this step only if you are using the AdvancedCopy function.

Create the following directories for the backup data in Explorer or a similar program.

- \$BAK_DIR\CCM\etc
- \$BAK_DIR\CCM\etc\db
- \$BAK_DIR\CCM\etc\db\cg
- \$BAK_DIR\CCM\etc\prop
- \$BAK_DIR\CCM\var\micc\database

Using Explorer or a similar program, copy the following files to their backup locations.

Copy Source File	Copy Destination Directory
\$ENV_DIR\CCM\etc\db\eternus.xml	\$BAK_DIR\CCM\etc\db
\$TMP_DIR\CCM\var\micc\database\DeviceRegList.xml	\$BAK_DIR\CCM\var\micc\database

If copy source files exist, copy the following files to their backup locations using Explorer or a similar program.

Copy Source File	Copy Destination Directory
\$ENV_DIR\CCM\etc\prop\user.properties	\$BAK_DIR\CCM\etc\prop

Copy Source File	Copy Destination Directory
\$ENV_DIR\CCM\etc\stxc.alias	\$BAK_DIR\CCM\etc
\$ENV_DIR\CCM\etc\stxc_ext.alias	
\$ENV_DIR\CCM\etc\stxcvolinf	

Using Explorer or a similar program, copy the files belonging to the following directory to their backup location.

Copy Source Directory	Copy Destination Directory
\$ENV_DIR\CCM\etc\db\cg	\$BAK_DIR\CCM\etc\db\cg

14. Back up the license management database.

Create the following backup directory in Explorer or a similar program.

- \$BAK_DIR\LM

Execute the following command. The backup data will be created with the file name specified in *<filename>*.

```
$INS_DIR\LM\bin\esflm backup $BAK_DIR\LM\<filename>
```

15. Back up the Optimization Option environment. (For Optimization Option only)

Create the following directories for the backup data in Explorer or a similar program.

- \$BAK_DIR\AST\Manager\etc\opt\FJSVssast\data\policy
- \$BAK_DIR\AST\Manager\etc\opt\FJSVssast\data\pool
- \$BAK_DIR\AST\Manager\var\opt\FJSVssast\data\perf

Using Explorer or a similar program, copy the following files to their backup locations.

Copy Source File	Copy Destination Directory
\$ENV_DIR\AST\Manager\etc\opt\FJSVssast\data\policy\TierPolicy.xml	\$BAK_DIR\AST\Manager\etc\opt\FJSVssast\data\policy

Using Explorer or a similar program, copy the subdirectories and files belonging to the following directory to their backup location.

Copy Source Directory	Copy Destination Directory
\$ENV_DIR\AST\Manager\etc\opt\FJSVssast\data\pool	\$BAK_DIR\AST\Manager\etc\opt\FJSVssast\data\pool
\$TMP_DIR\AST\Manager\var\opt\FJSVssast\data\perf	\$BAK_DIR\AST\Manager\var\opt\FJSVssast\data\perf

16. Execute the following batch to start ETERNUS SF Manager services.

```
$INS_DIR\Common\bin\Start_ESFservice.bat
```

9.1.1.2.6 Backup of Windows Manager (cluster environment)

For cluster environment, follow the procedure below to save the environment for the Storage Cruiser's manager.

1. Stop all cluster services which the Manager belongs to.

Refer to "Cluster transaction and local transaction" in the *ETERNUS SF Cluster Environment Setup Guide* for details of cluster transaction.

2. Mount the shared disk on the primary node.

3. Start the ETERNUS SF Manager Postgres service.
Open Service Control Manager to start the following service:
 - ETERNUS SF Manager Postgres Service
4. Perform step 2 and steps 4 to 15 of "9.1.1.2.5 Backup of Windows Manager" on the primary node.
Directory description in "9.1.1.2.5 Backup of Windows Manager" are replaced to the following directories.
 - \$BAK_DIR means the backup destination directory.
 - \$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.
 - \$ENV_DIR means "Environment Directory" specified at the ETERNUS SF Manager installation.
 - \$TMP_DIR means "Work Directory" as specified during installation.
5. Stop the ETERNUS SF Manager Postgres service.
Open Service Control Manager to stop the following service:
 - ETERNUS SF Manager Postgres Service
6. Unmount the shared disk mounted in step 2.
7. Start all cluster transactions which the Manager belongs to.

9.1.1.3 Restoring Manager

Restore the environment for the Storage Cruiser's manager if an error has occurred in the Management Server.

All of the tasks for restoring Manager are performed in the Management Server.

9.1.1.3.1 Restoring Solaris OS Manager

Follow the procedure below to restore the environment for the Storage Cruiser's manager.

For restoration after reinstalling Manager, be sure to complete installation and setup before restoration. Refer to "Installing ETERNUS SF Manager" and "Setting Up ETERNUS SF Manager" in the *ETERNUS SF Installation and Setup Guide* for installation and setup.



Information

About description in the procedure

- "\$BAK_DIR" signifies the backup destination directory.

1. Re-setup Storage Cruiser's manager.

Install ETERNUS SF Manager and set it up as Storage Cruiser's manager.

Refer to "Installing ETERNUS SF Manager" and "Setting Up ETERNUS SF Manager" in the *ETERNUS SF Installation and Setup Guide* for installation and setup.

2. Stop the ETERNUS SF Manager Tomcat Service.

Execute the following shell script to stop the service.

```
/opt/FJSVesfcm/bin/stop-webservice.sh
```

3. Restore the backup data.

Execute the following command. Specify the default value 15432 to *<port-number>*, however, if you have changed the port number, specify the changed port number to *<port-number>*.

```
/opt/FJSVesfcm/postgres/bin/psql -U esfpostgres -p <port-number> postgres
```

A prompt is displayed, with the server awaiting input. Input the following keywords in the sequence shown below.

```
master01!  
drop database esfdb;  
\q
```

Execute the following command to restore the backup data. Specify the default value 15432 to *<port-number>*, however, if you have changed the port number, specify the changed port number to *<port-number>*. For *<filename>*, input the file name specified when the backup data was created.

```
/opt/FJSVesfcm/postgres/bin/psql -U esfpostgres -p <port-number>  
-f $BAK_DIR/Common/<filename> postgres
```

A prompt is displayed, with the server awaiting input. Input the following keyword.

```
master01!
```

4. Execute the following shell script to stop the ETERNUS SF Manager services.

```
/opt/FJSVesfcm/bin/stopesf.sh
```

Note

Upon executing the shell script, multiple messages stating that the ETERNUS SF Manager Tomcat Service has already been stopped will be displayed. These messages do not pose a problem and can be ignored.

5. Restore the device management information.

In the normal restore operation, execute "Restore the device management information".

If upgrade from a previous version, execute "Upgrade from a previous version".

- Restore the device management information

Delete the files belonging to the restore destination directory.

However, be sure not to delete the restore destination directory itself. If the restore destination directory does not exist, create one.

```
rm -rf /var/opt/FJSVssmgr/current/opencimom/logr/*
```

Copy the files from the backup location.

```
cp -Rp $BAK_DIR/var/opt/FJSVssmgr/current/opencimom/logr/* /var/opt/FJSVssmgr/current/  
opencimom/logr/
```

- Upgrade from a previous version

cimrestore.sh is used for restoring the device management information. Refer to "[Appendix D Migrating from the Previous Version](#)" for further information of cimrestore.sh.

Delete the files belonging to the restore destination directory.

However, be sure not to delete the restore destination directory itself. If the restore destination directory does not exist, create one.

```
rm -rf /var/opt/FJSVssmgr/current/opencimom/logr/*
```

Move to a directory that cimrestore.sh is stored, and execute cimrestore.sh.

```
./cimrestore.sh $BAK_DIR/logr
```

6. Restore the essential file.

Delete the restore destination file.

```
rm -f /var/opt/FJSVssmgr/current/systemevent.csv
```

Copy the file from the backup location. If there are no files to be copied, restore is not required.

```
cp -p $BAK_DIR/var/opt/FJSVssmgr/current/systemevent.csv /var/opt/FJSVssmgr/current/
```

7. Restore the files related to the performance management function.

This step can be skipped if you are not using the performance management function or the files related to the performance management function are not backed up.

Delete the subdirectories and files belonging to the restore destination directory.

However, be sure not to delete the restore destination directory itself. If the restore destination directory itself does not exist, create one.

```
rm -f /etc/opt/FJSVssmgr/current/perf.conf
rm -rf /var/opt/FJSVssmgr/current/perf/*
```

Copy the subdirectories and files from the backup location.

```
cp -p $BAK_DIR/etc/opt/FJSVssmgr/current/perf.conf /etc/opt/FJSVssmgr/current/
cp -Rp $BAK_DIR/var/opt/FJSVssmgr/current/perf/* /var/opt/FJSVssmgr/current/perf/
```

8. Restore the other files which can be customized.

This restoration is unnecessary for the files or the directories which have not been backed up.

Copy the subdirectories and files from the backup location.

```
# cp -p $BAK_DIR/etc/opt/FJSVssmgr/current/sanma.conf /etc/opt/FJSVssmgr/current/
# cp -p $BAK_DIR/etc/opt/FJSVssmgr/current/ssmgr.conf /etc/opt/FJSVssmgr/current/
# cp -p $BAK_DIR/etc/opt/FJSVssmgr/current/trapop.sh /etc/opt/FJSVssmgr/current/
# cp -p $BAK_DIR/etc/opt/FJSVssmgr/current/traprm.sh /etc/opt/FJSVssmgr/current/
# cp -Rp $BAK_DIR/etc/opt/FJSVssmgr/current/eventmail/* /etc/opt/FJSVssmgr/current/eventmail/
```

9. Restore the SNMP Trap XML definition files.

This restoration is unnecessary for the files which have not been backed up.

Copy the SNMP Trap XML definition files from the backup location.

```
# cp -p $BAK_DIR/etc/opt/FJSVssmgr/current/snmpth/*.xml /etc/opt/FJSVssmgr/current/snmpth/
```

10. Restore the device polling setting files.

This restoration is unnecessary for the files which have not been backed up.

Copy the files from the backup location.

```
# cp -p $BAK_DIR/etc/opt/FJSVssmgr/current/devicepolling/*.xml /etc/opt/FJSVssmgr/current/
devicepolling/
```

11. Restore the polling service setting file.

This restoration is unnecessary for the files which have not been backed up.

Copy the file from the backup location.

```
# cp -p $BAK_DIR/etc/opt/FJSVssmgr/current/polling/*.xml /etc/opt/FJSVssmgr/current/polling/
```

12. Restore the files related to copy group and copy pair definitions.

Perform this step only if you are using the AdvancedCopy function.

Delete the subdirectories and files belonging to the restore destination directory.

```
rm -rf /etc/opt/FJSVccm/db/cg/*
rm -f /etc/opt/FJSVccm/prop/user.properties
```

```
rm -f /etc/opt/FJSVccm/acc/etx/stxc.alias
rm -f /etc/opt/FJSVccm/acc/etx/stxc_ext.alias
rm -f /etc/opt/FJSVccm/acc/etx/stxcvolinf
```

Copy the subdirectories and files from the backup location.

```
cp -p $BAK_DIR/CCM/etc/db/eternus.xml /etc/opt/FJSVccm/db
cp -p $BAK_DIR/CCM/var/micc/database/DeviceRegList.xml /var/opt/FJSVccm/micc/database
cp -p $BAK_DIR/CCM/etc/prop/user.properties /etc/opt/FJSVccm/prop
cp -p $BAK_DIR/CCM/etc/stxc.alias /etc/opt/FJSVccm/acc/etx
cp -p $BAK_DIR/CCM/etc/stxc_ext.alias /etc/opt/FJSVccm/acc/etx
cp -p $BAK_DIR/CCM/etc/stxcvolinf /etc/opt/FJSVccm/acc/etx
cp -Rp $BAK_DIR/CCM/etc/db/cg/* /etc/opt/FJSVccm/db/cg
```

13. Restore the license management database.

Execute the following command. For <filename>, input the file name which was specified when the backup data was created.

```
/opt/FJSVesflm/bin/esflm restore $BAK_DIR/LM/<filename>
```

14. Restore the Optimization Option environment. (For Optimization Option only)

Delete the subdirectories and files belonging to the restore destination directory.

However, be sure not to delete the restore destination directory itself. If the restore destination directory itself does not exist, create one.

```
rm -f /etc/opt/FJSVssast/data/policy/TierPolicy.xml
rm -f /etc/opt/FJSVssast/data/pool/*
rm -rf /var/opt/FJSVssast/data/perf/*
```

Copy the subdirectories and files from the backup location.

```
cp -p $BAK_DIR/etc/opt/FJSVssast/data/policy/TierPolicy.xml /etc/opt/FJSVssast/data/policy/
cp -p $BAK_DIR/etc/opt/FJSVssast/data/pool/* /etc/opt/FJSVssast/data/pool/
cp -Rp $BAK_DIR/var/opt/FJSVssast/data/perf/* /var/opt/FJSVssast/data/perf/
```

15. Execute the following shell script to start ETERNUS SF Manager services.

```
/opt/FJSVesfcm/bin/startesf.sh
```

9.1.1.3.2 Restoring Solaris OS Manager (cluster environment)

For cluster environment, follow the procedure below to restore the environment for the Storage Cruiser's manager.

For restoration after reinstalling Manager, be sure to complete installation and setup before restoration. Refer to "Customization for Management Server Transaction" in the *ETERNUS SF Cluster Environment Setup Guide* for installation and setup.

1. Stop all cluster transaction which the Manager belongs to.

Refer to "Cluster transaction and local transaction" in the *ETERNUS SF Cluster Environment Setup Guide* for details of cluster transaction.

2. Mount the shared disk on the primary node.

3. Start the ETERNUS SF Manager Postgres service.

Execute the following command to start the ETERNUS SF Manager Postgres service:

```
/etc/init.d/startSFmanager start-postgres
```

4. Perform step 3 and steps 5 to 14 of "9.1.1.3.1 Restoring Solaris OS Manager" on the primary node.

5. Stop the ETERNUS SF Manager Postgres service.

Execute the following command to stop the ETERNUS SF Manager Postgres service:

```
/etc/init.d/startSFmanager stop-postgres
```

6. Unmount the shared disk mounted in step 2.
7. Start all cluster transactions which the Manager belongs to.

9.1.1.3.3 Restoring Linux Manager

Since the procedure for restoring the Linux version of Manager is identical to that for restoring the Solaris OS versions, refer to "[9.1.1.3.1 Restoring Solaris OS Manager](#)" for performing this operation.

9.1.1.3.4 Restoring Linux Manager (cluster environment)

Since the procedure for restoring the Linux version of Manager is identical to that for restoring the Solaris OS versions in cluster environment, refer to "[9.1.1.3.2 Restoring Solaris OS Manager \(cluster environment\)](#)" for performing this operation.

9.1.1.3.5 Restoring Windows Manager

Follow the procedure below to restore the environment for Storage Cruiser's manager.

For restoration after reinstalling Manager, be sure to complete installation and setup before restoration. Refer to the sections "Installing ETERNUS SF Manager" and "Setting Up ETERNUS SF Manager" in the *ETERNUS SF Installation and Setup Guide* for the installation and setup procedures.



Information

About description in the procedure

- \$BAK_DIR means the backup destination directory.
- \$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.
- \$ENV_DIR means "Environment Directory" specified at the ETERNUS SF Manager installation.
- \$TMP_DIR means "Work Directory" specified at the ETERNUS SF Manager installation.

1. Re-setup Storage Cruiser's manager.

Install ETERNUS SF Manager and set it up as Storage Cruiser's manager.

Refer to the sections "Installing ETERNUS SF Manager" and "Setting Up ETERNUS SF Manager" in the *ETERNUS SF Installation and Setup Guide* for installation and setup procedures.

2. Stop the ETERNUS SF Manager Tomcat Service.

Open the Service Control Manager and stop the following service.

- ETERNUS SF Manager Tomcat Service

3. Restore the backup data.

Execute the following command. Specify the default value 15432 to *<port-number>*, however, if you have changed the port number, specify the changed port number to *<port-number>*.

```
$INS_DIR\Common\sys\postgres\bin\psql -U esfpostgres -p <port-number> postgres
```

A prompt is displayed, with the server awaiting input. Input the following keywords in the sequence shown below.

```
master01!
drop database esfdb;
\q
```

Execute the following command to restore the backup data. Specify the default value 15432 to *<port-number>*, however, if you have changed the port number, specify the changed port number to *<port-number>*. For *<filename>*, input the file name which was specified when the backup data was created.

```
$INS_DIR\Common\sys\postgres\bin\psql -U esfpostgres -p <port-number>
-f $BAK_DIR\Common\<filename> postgres
```

A prompt is displayed, with the server awaiting input. Input the following keyword.

```
master01!
```

- Execute the following batch to stop the ETERNUS SF Manager services.

```
$INS_DIR\Common\bin\Stop_ESFservice.bat
```

 **Note**

Upon executing the batch, multiple messages stating that the ETERNUS SF Manager Tomcat Service has already been stopped will be displayed. These messages do not pose a problem and can be ignored.

- Restore the device management information.

In the normal restore operation, execute "Restore the device management information".

If upgrade from a previous version, execute "Upgrade from a previous version".

- Restore the device management information

Using Explorer or a similar program, delete the files belonging to the following restore destination directory.

However, be sure not to delete the restore destination directory itself. If the restore destination directory does not exist, create it.

- \$TMP_DIR\ESC\Manager\var\opt\FJSVssmgr\current\opencimom\logr

Using Explorer or a similar program, copy the files belonging to the following directory from the backup location.

Copy Source Directory	Copy Destination Directory
\$BAK_DIR\ESC\Manager\var\opt\FJSVssmgr\current\opencimom\logr	\$TMP_DIR\ESC\Manager\var\opt\FJSVssmgr\current\opencimom\logr

- Upgrade from a previous version

cimrestore.bat is used for restore the device management information. Refer to "[Appendix D Migrating from the Previous Version](#)" for further information of cimrestore.bat.

Delete the files belonging to the restoration destination directory.

However, be sure not to delete the restoration destination directory itself. If the restoration destination directory does not exist, create one.

- \$TMP_DIR\ESC\Manager\var\opt\FJSVssmgr\current\opencimom\logr

In the command prompt, move to a directory that cimrestore.bat is stored, and then execute cimrestore.bat.

```
cimrestore.bat "$BAK_DIR\logr"
```

- Restore the essential file.

Using Explorer or similar programs, delete the following restore destination file.

- \$TMP_DIR\ESC\Manager\var\opt\FJSVssmgr\current\systemevent.csv

Using Explorer or a similar program, copy the following file from the backup location.

Copy Source File	Copy Destination Directory
\$BAK_DIR\ESC\Manager\var\opt\FJSVssmgr\current\systemevent.csv	\$TMP_DIR\ESC\Manager\var\opt\FJSVssmgr\current

7. Restore the files related to the performance management function.

This step can be skipped if you are not using the performance management function or the files related to the performance management function are not backed up.

Using Explorer or a similar program, delete the subdirectories and files belonging to the following restore destination directory.

However, be sure not to delete the restore destination directory itself. If the restore destination directory itself does not exist, create it.

- \$TMP_DIR\ESC\Manager\var\opt\FJSVssmgr\current\perf

Using Explorer or a similar program, copy the following file from its backup location.

Copy Source File	Copy Destination Directory
\$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\perf.conf	\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current

Using Explorer or a similar program, copy the subdirectories and files belonging to the following directory from their backup location.

Copy Source Directory	Copy Destination Directory
\$BAK_DIR\ESC\Manager\var\opt\FJSVssmgr\current\perf	\$TMP_DIR\ESC\Manager\var\opt\FJSVssmgr\current\perf

8. Restore the other files which can be customized.

This restoration is unnecessary for the files or the directories which have not been backed up.

Using Explorer or a similar program, copy the following files from the backup locations.

Copy Source File	Copy Destination Directory
\$BAK_DIR\ESC\Manager\opt\FJSVssmgr\bin\manager.ini	\$INS_DIR\ESC\Manager\opt\FJSVssmgr\bin
\$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\sanma.conf	\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current
\$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\ssmgr.conf	
\$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\trapop.bat	
\$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\traprm.bat	

Using Explorer or a similar program, copy the subdirectories and files belonging to the following directory from their backup location.

Copy Source Directory	Copy Destination Directory
\$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\eventmail	\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\eventmail

9. Restore the SNMP Trap XML definition files.

This restoration is unnecessary for the files which have not been backed up.

Using Explorer or a similar program, copy the SNMP Trap XML definition files from their backup location.

Copy Source File	Copy Destination Directory
\$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\nmpth*.xml	\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\nmpth

10. Restore the device polling setting files.

This restoration is unnecessary for the files which have not been backed up.

Using Explorer or a similar program, copy the device polling setting file from its backup location.

Copy Source File	Copy Destination Directory
\$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\devicepolling\DP_config.xml	\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\devicepolling

11. Restore the polling service setting file.

This restoration is unnecessary for the files which have not been backed up.

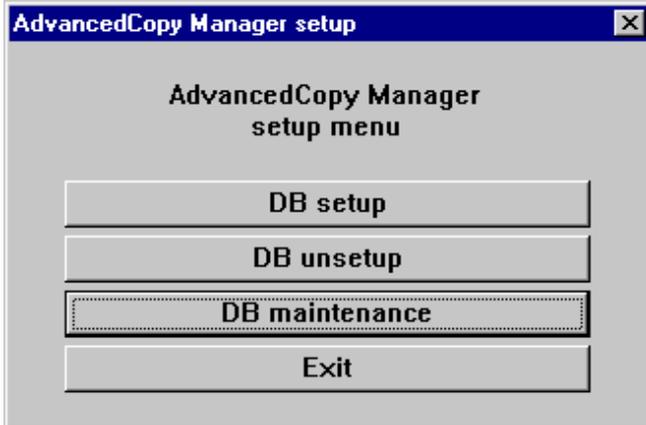
Using Explorer or a similar program, copy the polling service setting file from its backup location.

Copy Source File	Copy Destination Directory
\$BAK_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\polling\pollingService.xml	\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\polling

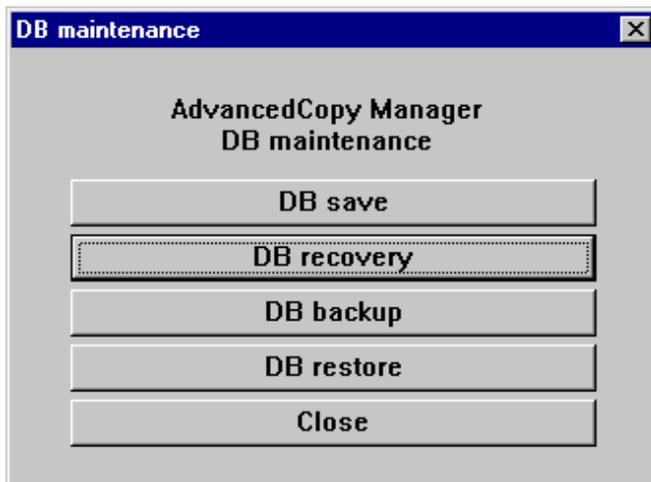
12. Restore the database.

Follow the steps below to restore the database.

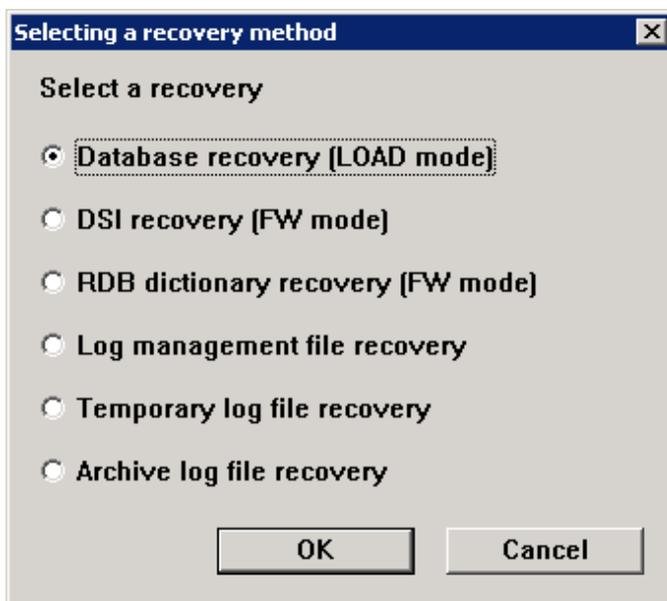
1. From the Start button, select [Programs]-[ETERNUS SF Manager]-[DB Setup Tools].
2. Once the screen shown below is displayed, click the [DB maintenance] button.



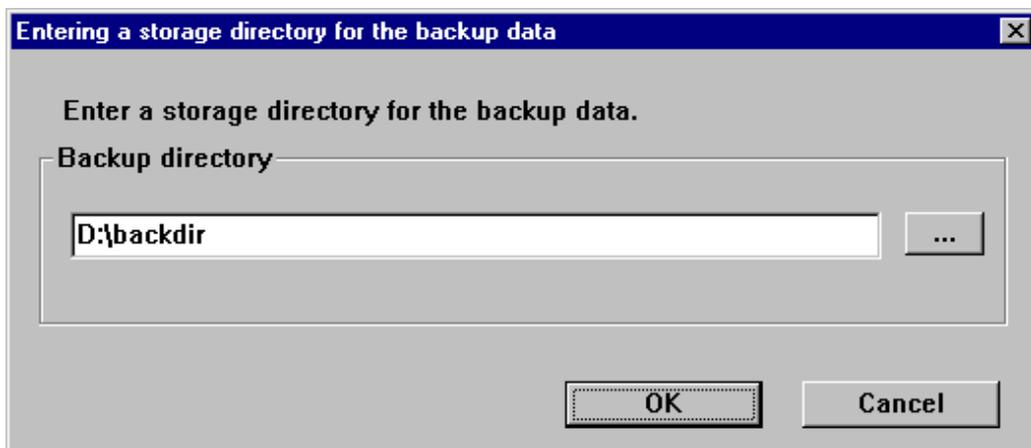
3. Once the DB Maintenance screen shown below is displayed, click the [DB recovery] button.



4. The recovery method selection is displayed. Select "Database recovery [LOAD mode]" and click the [OK] button.



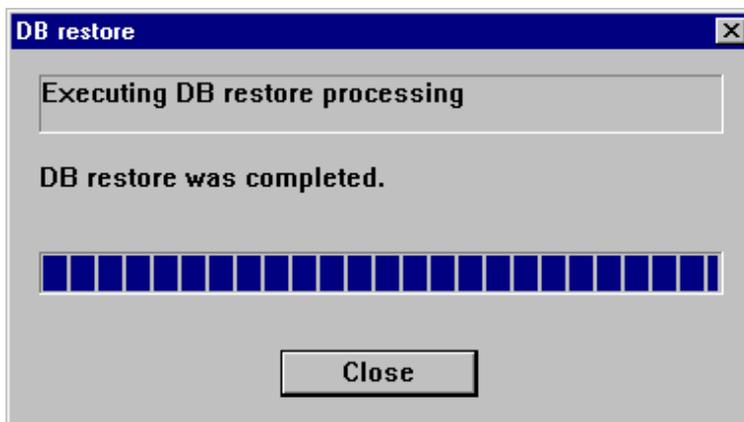
5. The screen for inputting the storage destination directory for the backup data is displayed. Specify the directory in which the backup data is stored and click the [OK] button.



- Once the confirmation screen for the processing is displayed, check that there are no mistakes with the input details and click the [Start] button.



- When the DB Recovery processing is complete, the following completion window will be displayed. Click the [Close] button.



- Restore the registry.

Using Explorer or a similar program, copy the following files from their backup location.

Copy Source File	Copy Destination Directory
\$BAK_DIR\ACM\etc\swnode.ini	\$ENV_DIR\ACM\etc
\$BAK_DIR\ACM\etc\device.ini	

- Restore the files related to copy group and copy pair definitions.

Perform this step only if you are using the AdvancedCopy function.

Using Explorer or a similar program, delete the files belonging to the following restore destination directory.

- \$ENV_DIR\CCM\etc\db\cg

Delete the following files if they exist.

- \$ENV_DIR\CCM\etc\prop\user.properties
- \$ENV_DIR\CCM\etc\stxc.alias
- \$ENV_DIR\CCM\etc\stxc_ext.alias
- \$ENV_DIR\CCM\etc\stxcvolinf

Using Explorer or a similar program, copy the following files from their backup locations.

Copy Source File	Copy Destination Directory
\$BAK_DIR\CCM\etc\db\eternus.xml	\$ENV_DIR\CCM\etc\db
\$BAK_DIR\CCM\var\micc\database \DeviceRegList.xml	\$TMP_DIR\CCM\var\micc\database

If copy source files exist, copy the following files from the backup location using Explorer or a similar program.

Copy Source File	Copy Destination Directory
\$BAK_DIR\CCM\etc\prop\user.properties	\$ENV_DIR\CCM\etc\prop
\$BAK_DIR\CCM\etc\stxc.alias	\$ENV_DIR\CCM\etc
\$BAK_DIR\CCM\etc\stxc_ext.alias	
\$BAK_DIR\CCM\etc\stxcvolinf	

Using Explorer or a similar program, copy the files belonging to the following directory from their backup location.

Copy Source Directory	Copy Destination Directory
\$BAK_DIR\CCM\etc\db\cg	\$ENV_DIR\CCM\etc\db\cg

15. Restore the license management database.

Execute the following command. For <filename>, input the file name which was specified when the backup data was created.

```
$INS_DIR\LM\bin\esflm restore $BAK_DIR\LM\<filename>
```

16. Restore the Optimization Option environment. (For Optimization Option only)

Delete the subdirectories and files belonging to the restore destination directory.

However, be sure not to delete the restore destination directory itself. If the restore destination directory itself does not exist, create one.

- \$TMP_DIR\AST\Manager\var\opt\FJSVssast\data\perf

Using Explorer or a similar program, copy the following files from their backup locations.

Copy Source File	Copy Destination Directory
\$BAK_DIR\AST\Manager\etc\opt\FJSVssast\data \policy\TierPolicy.xml	\$ENV_DIR\AST\Manager\etc\opt\FJSVssast\data \policy

Using Explorer or a similar program, copy the subdirectories and files belonging to the following directory from their backup location.

Copy Source Directory	Copy Destination Directory
\$BAK_DIR\AST\Manager\etc\opt\FJSVssast\data \pool	\$ENV_DIR\AST\Manager\etc\opt\FJSVssast\data \pool
\$BAK_DIR\AST\Manager\var\opt\FJSVssast\data \perf	\$TMP_DIR\AST\Manager\var\opt\FJSVssast\data\perf

17. Execute the following batch to start ETERNUS SF Manager services.

```
$INS_DIR\Common\bin\Start_ESFservice.bat
```

9.1.1.3.6 Restoring Windows Manager (cluster environment)

For cluster environment, follow the procedure below to restore the environment for the Storage Cruiser's manager.

For restoration after reinstalling Manager, be sure to complete installation and setup before restoration. Refer to "Installing ETERNUS SF Manager" and "Customization for Management Server Transaction" in the *ETERNUS SF Cluster Environment Setup Guide* for installation and setup.

1. Stop all cluster transactions which the Manager belongs to.

Refer to "Cluster transaction and local transaction" in the *ETERNUS SF Cluster Environment Setup Guide* for details of cluster transaction.

2. Mount the shared disk on the primary node.

3. Start the ETERNUS SF Manager Postgres service.

Open Service Control Manager to start the following service:

- ETERNUS SF Manager Postgres Service

4. Perform step 3 and steps 5 to 16 of "[9.1.1.3.5 Restoring Windows Manager](#)" on the primary node.

Directory description in "[9.1.1.3.5 Restoring Windows Manager](#)" are replaced to the following directories.

- \$BAK_DIR means the backup destination directory.
- \$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.
- \$ENV_DIR means "Environment Directory" specified at the ETERNUS SF Manager installation.
- \$TMP_DIR means "Work Directory" specified at the ETERNUS SF Manager installation.

5. Stop the ETERNUS SF Manager Postgres service.

Open Service Control Manager to stop the following service:

- ETERNUS SF Manager Postgres Service

6. Unmount the shared disk mounted in step 2.

7. Start all cluster transactions which the Manager belongs to.

9.1.2 Changing the operating environment

9.1.2.1 Changing the IP address of the Management Server

Follow the procedure given below to change the IP address of the Management Server.

1. Change the system IP address on the Management Server.
2. Reboot the Management Server.



- If the Management Server is operated in cluster environment, refer to "Changing the IP address for Management Server transactions" in the *ETERNUS SF Cluster Environment Setup Guide*.
- If SNMP Trap monitors device errors, you need to change the SNMP Trap transmission place. Execute the command which is for changing the SNMP Trap transmission place IP address. Refer to the "[Chapter 11 Command References](#)" for further details of the command.

9.1.2.2 Changing the IP address of a server node (host)

Follow the procedure given below to change the IP address of a server node.

- Changing the IP address of a server node for which Agent is installed
 1. Using the Web Console, delete the device icon of the server node (without deleting the access path).
 2. Change the system IP address on the server node.
 3. Stop the server node Agent on the server node.
 4. Execute the agent information change command on the server node to change the start IP of server node Agent.
Refer to "Agent information change command" in "[Chapter 11 Command References](#)" for detailed information of the agent information change command.
 5. Restart the server node Agent on the server node.
 6. Using the Web Console, perform [Register a server] with the new IP address.
- Changing the IP address of a VM host for which Agent is not installed
 1. Using the Web Console, delete the device icon of the VM host (without deleting the access path).
 2. Change the IP address of the VM host.
 3. Using the Web Console, perform [Register a server] with the new IP address.
- Changing the IP address of a guest operating system for which Agent is not installed
 1. Change the IP address of the guest operating system.
 2. Using the Web Console, perform [Reload Conf.] for a VM guest and a host.

9.1.2.3 Changing the server name of the Management Server

No special work is required.

9.1.2.4 Changing the name of a server node (host)

Follow the procedure given below to change the name of a server node.

- Changing the name of a server node for which Agent is installed
 1. Using the Web Console, delete (without deleting the access path) a device icon of the server node that changes the server node name.
 2. Change the server node name on the server node.
 3. Stop the server node Agent on the server node.
 4. Execute the agent information change command on the server node to change the setting of server node Agent.
Refer to "Agent information change command" in "[Chapter 11 Command References](#)" for detailed information of the agent information change command.
 5. Restart the server node Agent on the server node.
 6. Using the Web Console, perform [Register a server] on the server node.
- Changing the host name of a VM host for which Agent is not installed
 1. Using the Web Console, delete (delete the access path change) a device icon of the VM host that changes the host name.
 2. Change the host name of the VM host.
 3. Using the Web Console, perform [Register a server] for the VM host.
- Changing the virtual machine name of a VM guest or the host name of a guest operating system, for which Agent is not installed
 1. Change the virtual machine name of the VM guest or the host name of a guest operating system.

- Using the Web Console, perform [Reload Conf.] for the VM guest and the host.

Note

Information of an associated application element created in the Correlation window is not inherited when the server node name is changed. Register the application element again.

9.1.2.5 Changing the IP address or the SNMP community name of a supported device

To change the IP address of a device with support level A or B registered with this software or to change the SNMP community name, follow the procedure below:

To change the IP address

If the device is an ETERNUS Disk storage system, first change the IP address on the device side, and then change the IP address for the device in the Web Console. If the device is something other than an ETERNUS Disk storage system, first change the IP address on the device side, then temporarily delete the device in Web Console, and lastly, using the changed IP address, re-register the device.

Note

- If the IP address is changed for a device where performance management is performed, then follow the procedure below to reflect the new IP address. Refer to "[7.2.9 Updating configuration information](#)" for details on the procedure.
 1. Configure the performance monitoring.
 2. Configure the threshold value monitoring (if threshold value monitoring is performed).
 3. Stop threshold value monitoring (if threshold value monitoring is performed).
 4. Stop performance monitoring.
 5. On the Web Console, change the IP address of the target device.
 6. Refer to "[A.10 Explanation of the Configuration Settings File](#)" for changing the file name (if Fibre Channel switch configuration information is customized).
 7. Create a configuration file.
 8. Start performance monitoring based on the settings specified in step 1.
 9. Start threshold value monitoring based on the settings specified in step 2 (if threshold value monitoring is performed).
- If the IP address is included in the device management software calling information, modify that information also to match the changes made.

Point

If the SNMP community name of a device is other than "public"

When the SNMP community name of the device has been changed to something other than "public" and its IP address is changed, set a new IP address for the SNMP community name before detecting any device using a new IP address. For the setting, refer to "[SNMP_COMMUNITY_NAME_FOR_IP](#)" in "[A.2 sanma.conf Parameter](#)", and reflect the contents of the setting file on this software.

To change the SNMP community name

1. Set the community name of each target device.

Refer to "[Chapter 4 Environment Configuration](#)" for information on the community name of each target device.

2. Set up the Management Server.

If the device is an ETERNUS Disk storage system, change the SNMP community name for the device in the Web Console. If the device is something besides an ETERNUS Disk storage system, temporarily delete the device in the Web Console and register it again using the changed SNMP community name.

Note

To change the SNMP trap community name at a Linux Manager, refer to "[A.11 snmptrapd.conf Configuration File](#)" and also change the snmptrapd.conf settings.

9.1.2.6 Changing the operation management of the clustered system (node name takeover)

In the environment of a clustered system operation, Node name inheritance may be used for Inherit network setting. Node name takeover affects the Name of a Server node.

In changing the Name of a Server node by setting Node name inheritance, refer to "[9.1.2.4 Changing the name of a server node \(host\)](#)".

9.1.2.7 Changing the configuration of supported devices

For changing the device configuration

If you have upgraded firmware to supported devices, added or removed hardware to/from supported devices, or added/deleted/changed the configuration within the supported devices (in the case of a disk storage system, its RAID Group, LogicalVolume, etc.), perform the following actions.

- Execute [Reload Conf.] for the relevant device to update the information for the target device.
- Update the configuration information of the performance management function by referring to "[7.2.9 Updating configuration information](#)". (Only when you are using the performance management function)

For applying Model upgrade options for ETERNUS Disk storage system

The device configuration is changed when applying Model upgrade options for ETERNUS Disk storage system. Perform the following operation after applying Model upgrade options for ETERNUS Disk storage system.

Before applying Model upgrade options	After applying Model upgrade options	Operation
ETERNUS DX60	ETERNUS DX80	Perform the procedure of "Operation on Model upgrade for ETERNUS DX60 to ETERNUS DX80, for ETERNUS DX80 S2 to ETERNUS DX90 S2, for ETERNUS DX410 S2 to ETERNUS DX440 S2" in the <i>ETERNUS SF Web Console Guide</i> . When using the performance management function, update the configuration information of the performance management function in reference to " 7.2.9 Updating configuration information " after performing the procedure above.
ETERNUS DX80 S2	ETERNUS DX90 S2	
ETERNUS DX410 S2	ETERNUS DX440 S2	
ETERNUS DX80 S2/DX90 S2	ETERNUS DX410 S2/DX440 S2	Perform the procedure of "Operation on Model upgrade for ETERNUS DX80 S2 or ETERNUS DX90 S2 to ETERNUS DX410 S2 or ETERNUS DX440 S2" in the <i>ETERNUS SF Web Console Guide</i> .

9.1.2.8 Changing the password of supported devices

Follow the procedure given below to change the password of a device which is been registered to this software.

Objected Device	Conduction
ETERNUS SN200 series (Brocade) Fibre Channel switch PRIMERGY fibre channel switch blade	Refer to " User name and password for Fibre Channel switch control " in " 4.2.1.1 Setting " to change the registered information.
Brocade VDX series PRIMERGY BX Ethernet Fabric Switch	Refer to " User name and password for Fibre Channel switch control " in " 4.2.3.1 Setting " to change the registered information.
VMware Infrastructure 3 Version 3.5 or later VMware vSphere 4 or later VMware ESXi 3.5 or later	Change the information registered in this software by referring to "User name and password" of "Changing environment" in " 4.1.8.2 VMware Infrastructure 3 Version 3.5 (or later), VMware vSphere 4 (or later) or VMware ESXi 3.5 (or later) ".
ETERNUS DX series ETERNUS2000 ETERNUS4000 ETERNUS8000	Change the account information for management of the device in the Web Console.

Except for the devices described above, there is no necessary to do any deal with this software when change the device's password.

9.2 [Solaris OS Version] Maintenance of Agent

9.2.1 Action to take for troubleshooting

Provided are the main examples for problems and their troubleshooting methods.

- If a new HBA has been added and the agent detected an environment error (during a time besides replacement of the HBA)
It is possible the server node has not started up in re-configuration mode after the HBA was added. In this sort of situation, restart the node in re-configuration mode.
- If a new HBA driver has been installed and the agent has detected an environment error
It is possible the server node was not started up in re-configuration mode after the installation of the driver. In this sort of situation, restart the node in re-configuration mode.

9.2.2 Collecting data for troubleshooting

If any problem occurs in Agent, collect troubleshooting information according to "[B.1 Troubleshooting information](#)".

9.2.3 Changing the administrative environment

9.2.3.1 Changing the IP address of a server node (host)

Refer to "[9.1.2.2 Changing the IP address of a server node \(host\)](#)" for detail.

9.3 [Windows Version] Maintenance of Agent

9.3.1 Action to take for troubleshooting

Major errors related to Agent running on a Windows Server 2003 server node and the corrective action to be taken are explained below. In the Event viewer or the GUI window, confirm the occurrence of the errors described below.

Manager cannot detect Agent.

- If all access paths under multipath control have been deleted by mistake, follow the recovery procedure given below.
 - Restart the Windows server node.
After an access path is deleted, multipath control no longer controls the path, and the related device is not recognized.
 - For the respective devices deleted by mistake on the access path, execute [Reload Conf.].
 - Set the access path that was deleted by mistake.
- Too many devices are connected to the Windows server node.
If too many devices are recognized by the Windows server node, Agent cannot perform processing within the response time, leading to a communication failure. In this event, check the connection configuration, and reduce the number of devices recognized by the Windows server node.
Access paths can be set for approximately 100 devices per one Windows server node, but the number of devices varies depending on the server node environment.

The GUI window contents differ from the physical configuration.

- An access path from an Emulex HBA cannot be drawn.
The Topology value in a driver parameter in the registry may be incorrect.
This caused by values in the registry being reset to default values, which occurs at either of the times: when a driver is re-installed; and when a driver is automatically re-installed because of the installation a new HBA having a different model number from that of a HBA already installed in a Windows Server 2003 machine (e.g., LP9802 and LP1050).
Using the registry editor, check the driver parameters of the HBA, correct any incorrect value that you find, and then select [Reload Conf.].
Refer to "[4.1.2 Windows server node \(host\)](#)" for information about driver parameters.

9.3.2 Collecting data for troubleshooting

If any problem occurs in Agent, collect troubleshooting information according to "[B.1 Troubleshooting information](#)".

9.3.3 Changing the administrative environment

9.3.3.1 Changing the IP address of a server node (host)

Refer to "[9.1.2.2 Changing the IP address of a server node \(host\)](#)" for detail.

9.4 [Linux Version] Maintenance of Agent

9.4.1 Collecting data for troubleshooting

If any problem occurs in Agent, collect troubleshooting information according to "[B.1 Troubleshooting information](#)".

9.4.2 Changing the administrative environment

9.4.2.1 Changing the IP address of a server node (host)

Refer to "[9.1.2.2 Changing the IP address of a server node \(host\)](#)" for detail.

9.5 [HP-UX Version] Maintenance of Agent

9.5.1 Collecting data for troubleshooting

If any problem occurs in Agent, collect troubleshooting information according to "[B.1 Troubleshooting information](#)".

9.5.2 Changing the administrative environment

9.5.2.1 Changing the IP address of a server node (host)

Refer to "[9.1.2.2 Changing the IP address of a server node \(host\)](#)" for detail.

9.6 [AIX Version] Maintenance of Agent

9.6.1 Collecting data for troubleshooting

If any problem occurs in Agent, collect troubleshooting information according to "[B.1 Troubleshooting information](#)".

9.6.2 Changing the administrative environment

9.6.2.1 Changing the IP address of a server node (host)

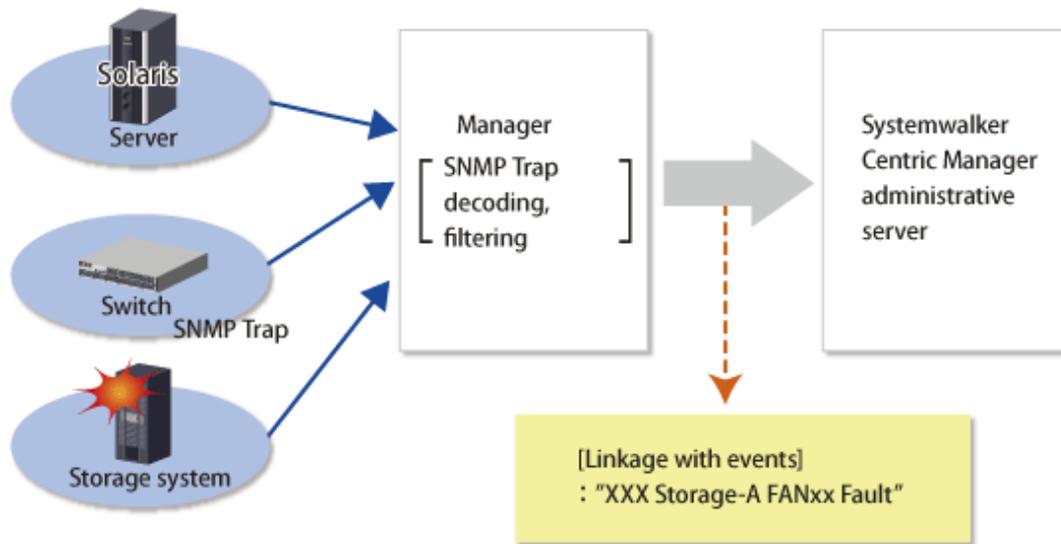
Refer to "[9.1.2.2 Changing the IP address of a server node \(host\)](#)" for detail.

Chapter 10 Linkage to Other Software

This chapter describes the operating methods conducting centralized administration in Systemwalker Centric Manager and other administrative software.

10.1 Linkage with Systemwalker Centric Manager

Linkage with Systemwalker Centric Manager enables it to be used for centralized monitoring of storage devices. In addition, linkage through window operations enables smooth troubleshooting of storage devices.



Note

Event Linkage is done not through the system log or event log on the operating system.

10.1.1 Linkage function with Systemwalker Centric Manager

Centralized event monitoring

Icons of the devices managed by this software are displayed in the monitoring window of the Systemwalker Centric Manager administrative client.

When an SNMP Trap is received from a monitored device, this software obtains only an event related to a fault and decodes it appropriately. This event is sent to Systemwalker Centric Manager to display the event. As a result, Systemwalker Centric Manager can be used to integrate existing server node management and storage device monitoring of this software. Moreover, functions such as Systemwalker Centric Manager e-Mail and pager can then be used for fault monitoring of the server node and storage devices.

By directly managing the storage equipment from Systemwalker Centric Manager, easier setup is achieved and more comprehensible troubleshooting reports are produced.

The icon for a device where a fault has occurred is indicated by "X" in Systemwalker Centric Manager, and information about the fault is displayed as event contents. When the event content is checked and action is taken for the fault, "Action" will be marked for the event. This operation clears the "X" state. The "X" state is not restored automatically by recovery from the fault.

"SSC" is indicated in the message for an event linked by this function to Systemwalker Centric Manager.

Linkage through window operations

On the Systemwalker Centric Manager monitoring window, select a menu item that was added to this software from the pop-up menu of a node of the faulty storage device, and then start it. This facilitates troubleshooting of the faulty storage device.

10.1.2 Required versions

Linkage of Systemwalker Centric Manager with this software requires one of the following versions of Systemwalker Centric Manager:

- Solaris OS , Linux
SystemWalker Centric Manager GEE V11 or later
SystemWalker Centric Manager-M EE/SE V11 or later
- Windows
SystemWalker Centric Manager-M EE/SE V11 or later

10.1.3 Preparations

Preparations for linkage of Systemwalker Centric Manager with this software are described below.

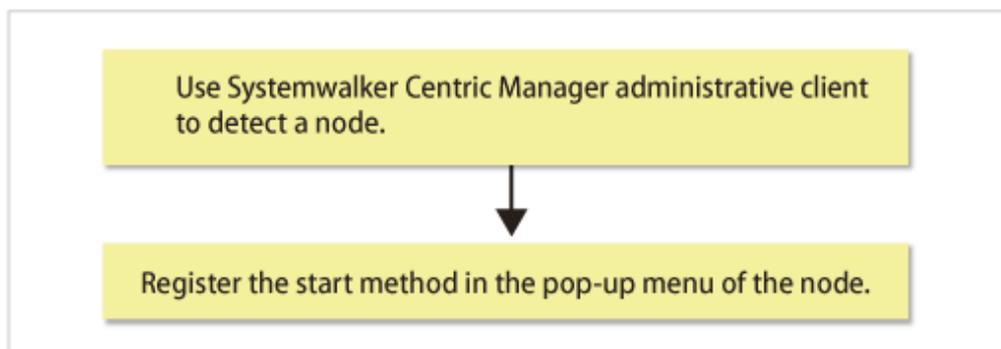
- Register the storage devices to be managed with this software before setting up a link with Systemwalker Centric Manager.
- So that the names of the devices registered in this software can be resolved, either register the IP address and host name information for each device in the DNS server that is referenced by the Management Server, or define them in the `/etc/hosts` file on the Management Server.
- To detect node names and achieve software linkage, the Systemwalker Centric Manager administrative server and the Management Server of this software should both be managed by the DNS server, and have the same `/etc/hosts` definition. Confirm the settings.
- The Systemwalker Centric Manager administrative server must be the same server, or Systemwalker Centric Manager Agent must be installed on the Management Server of this software.
Also, the Systemwalker Centric Manager administrative server or Systemwalker Centric Manager Agent on the same server must be operating during the linkage operation.

10.1.4 Setup procedure

Follow the procedure below on the Systemwalker Centric Manager operation management client.

Log in to the administrative client with a user name belonging to the Administrators group of the local group.

10.1.4.1 Setup on Systemwalker Centric Manager administrative client



1. On the Systemwalker Centric Manager administrative client, perform the procedure to detect a node in a subnet that contains storage devices.

2. Register the window start method in the pop-up menu of the node.

Register the start method of this software in the pop-up menu of the node of the storage device, using the Systemwalker Centric Manager mpapreg command.

The example below uses "ESC" as the menu name and "server1" as the server node name. Change these names according to the environment if necessary.

```
mpapreg -a -m ESC -p server1 -c "\"<Web browser execution path>\" \"https://<IP-address>:<port_number>/\""
```

- For <Web browser execution path>

- If using Internet Explorer:

- Specify the absolute path of iexplore.exe.

- If using Firefox:

- Specify the absolute path of firefox.exe.

- For <IP-address>

- Specify the IP address or Fully Qualified Domain Name (FQDN) of the Management Server.

- For <port_number>

- Specify the port number of "Web Console service (ETERNUS SF Manager Apache service)" specified when installing this software. Default is 9855.

Enclose the entire start command (-c option value) specified with the mpapreg command within double quotation marks ("), and enclose the start command (C:\Program Files\...\rcxclient.exe) with [\"] and [\\].

Note

- The operating environment must be set up in such a way that the Management Server recognizes the association between "Name" and "IP" in case that Systemwalker Centric Manager detects the server node by "Name", but not "IP". Please confirm that the name is registered in /etc/hosts or on the DNS server. Software linkage from this software to Systemwalker Centric Manager will fail if the Management Server does not recognize the association between an IP number and a node name.
- Perform this operation each time a new storage device is added.
- When the event that is displayed as Info in the status item of the event log window is reported to Systemwalker Centric Manager, it is regarded as "Display Mode: general" and is not displayed on the monitoring window. If you want to display it, execute [Display Mode in the Monitored Viewer] from **Action > Action Setting > Message** on the Systemwalker Centric Manager menu. Refer to the Systemwalker Centric Manager manual for details about [Display Mode in the Monitored Viewer].
- If the starting method of this software's Management Server is changed, execute the following command to delete the registered menu, and register it again. (In the example below, the menu name is "ESC.")

```
mpapreg -d -m ESC
```

- Confirm the content of registration by the following commands when the icon of this software is not displayed in the pop-up menu of the node though the menu addition by the mpapreg command has normally. (In the example below, the menu name is "ESC.")

```
mpapreg -v -m ESC
```

- After completing the procedure, restart the Systemwalker Centric Manager server of an administrative client, and execute "node detection" in the monitoring area. Updating of registered icons is enabled in the display.
- A parameter error (swsag5101) occurs if the mpapreg command contains an invalid parameter when starts from the batch file.

10.1.4.2 Action to be taken if Systemwalker Centric Manager administrative server and this software Management Server are the same server

If the Systemwalker Centric Manager administrative server and the Management Server of this software are the same server, both Systemwalker Centric Manager and this software receive and display SNMP Traps from devices. Perform the following task to prevent Systemwalker Centric Manager from directly receiving and displaying SNMP Traps from devices:

Suppressing Systemwalker Centric Manager reception of SNMP Traps from devices managed by this software

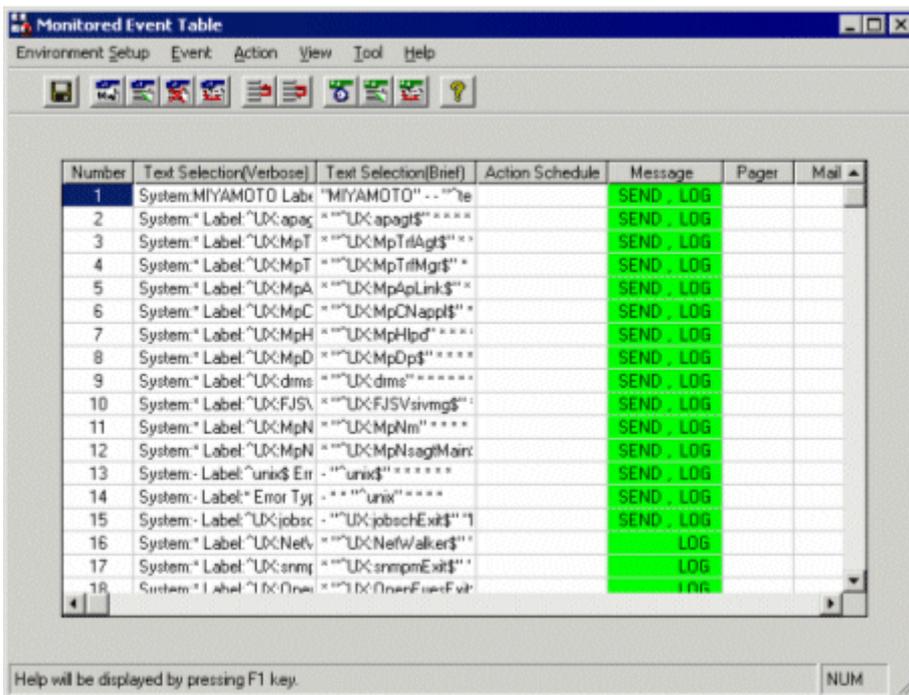
If one server node has the Systemwalker Centric Manager administrative server and Management Server of this software, the following steps prevent Systemwalker Centric Manager from direct reception of SNMP Traps of devices managed by this software. As a result, SNMP Traps would be received and decoded by this software and only SNMP Traps necessary for fault monitoring would be posted to Systemwalker Centric Manager. Consequently, when the SNMP Trap display function supported by Systemwalker Centric Manager is used, multiple traps appear for a single event or unnecessary SNMP Traps are displayed.

Information

These settings are not required if the Systemwalker Centric Manager-supported SNMP Trap display function is enabled.

1. From a Systemwalker Centric Manager administrative client, select [Event] - [Action Definition] in "System Monitoring."

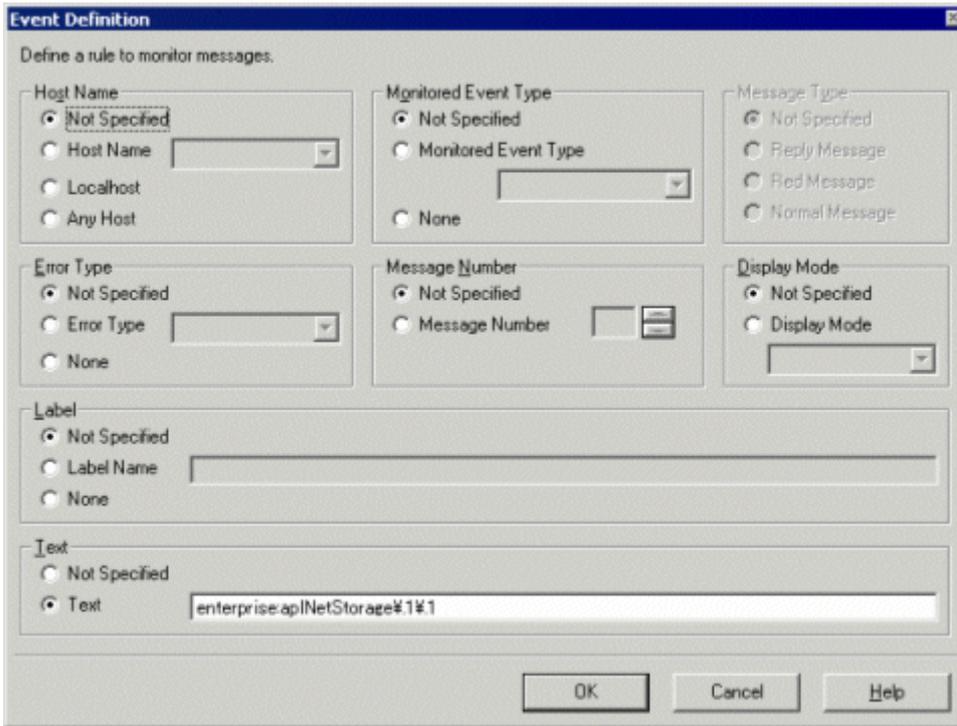
The Monitored Event Table dialog appears.



Number	Text Selection (Verbose)	Text Selection (Brief)	Action Schedule	Message	Pager	Mail
1	System:MIYAMOTO Label	"MIYAMOTO" - - "te		SEND LOG		
2	System: Label: ^UX:apoc	"^UX:apagt\$""		SEND LOG		
3	System: Label: ^UX:MpT	"^UX:MpTrAg\$""		SEND LOG		
4	System: Label: ^UX:MpT	"^UX:MpTrMgr\$""		SEND LOG		
5	System: Label: ^UX:MpA	"^UX:MpApLink\$""		SEND LOG		
6	System: Label: ^UX:MpC	"^UX:MpCNappt\$""		SEND LOG		
7	System: Label: ^UX:MpH	"^UX:MpHpd\$""		SEND LOG		
8	System: Label: ^UX:MpD	"^UX:MpDp\$""		SEND LOG		
9	System: Label: ^UX:dms	"^UX:dms\$""		SEND LOG		
10	System: Label: ^UX:FJSV	"^UX:FJSVsvimg\$""		SEND LOG		
11	System: Label: ^UX:MpN	"^UX:MpNm\$""		SEND LOG		
12	System: Label: ^UX:MpN	"^UX:MpNsagtMailv		SEND LOG		
13	System: Label: ^unix\$ Err	"^unix\$""		SEND LOG		
14	System: Label: Error Typ	"^unix\$""		SEND LOG		
15	System: Label: ^UX:jobzc	"^UX:jobzcExit\$""		SEND LOG		
16	System: Label: ^UX:NetV	"^UX:NetWalker\$""		LOG		
17	System: Label: ^UX:snmp	"^UX:snmpExit\$""		LOG		
18	System: Label: ^UX:Ones	"^UX:OnesExit\$""		LOG		

2. Select [Event] - [Event Addition] in the Monitored Event Table dialog.

The Event Definition dialog appears.



Define the following items:

Host Name

Check "Not specified".

Monitored Event Type

Check "Not specified".

Error Type

Check "Not specified".

Message Number

Check "Not specified".

Display Mode (only for Systemwalker Centric Manager 5.1 or later)

Check "Not specified".

Label

Check "Not specified".

Text

Specify one of the values shown below for an event definition.

Be sure to define this item only when individual devices are being managed. Otherwise, the item need not be defined.

Table 10.1 Lists of text

Device	Value
ETERNUS DX series ETERNUS2000 ETERNUS4000 ETERNUS8000	enterprise:aplNetStorage\.1 or enterprise:enterprises\.211\.4\.1\.1\.126\.1 (*1)
ETERNUS LT20 (SCSI)	enterprise:enterprises\.11\.2\.36\.1
ETERNUS LT20/LT20 S2/LT40/LT40 S2/LT60/ LT60 S2 (SAS/FC)	enterprise:enterprises\.20884\.10893\.2\.101\.3

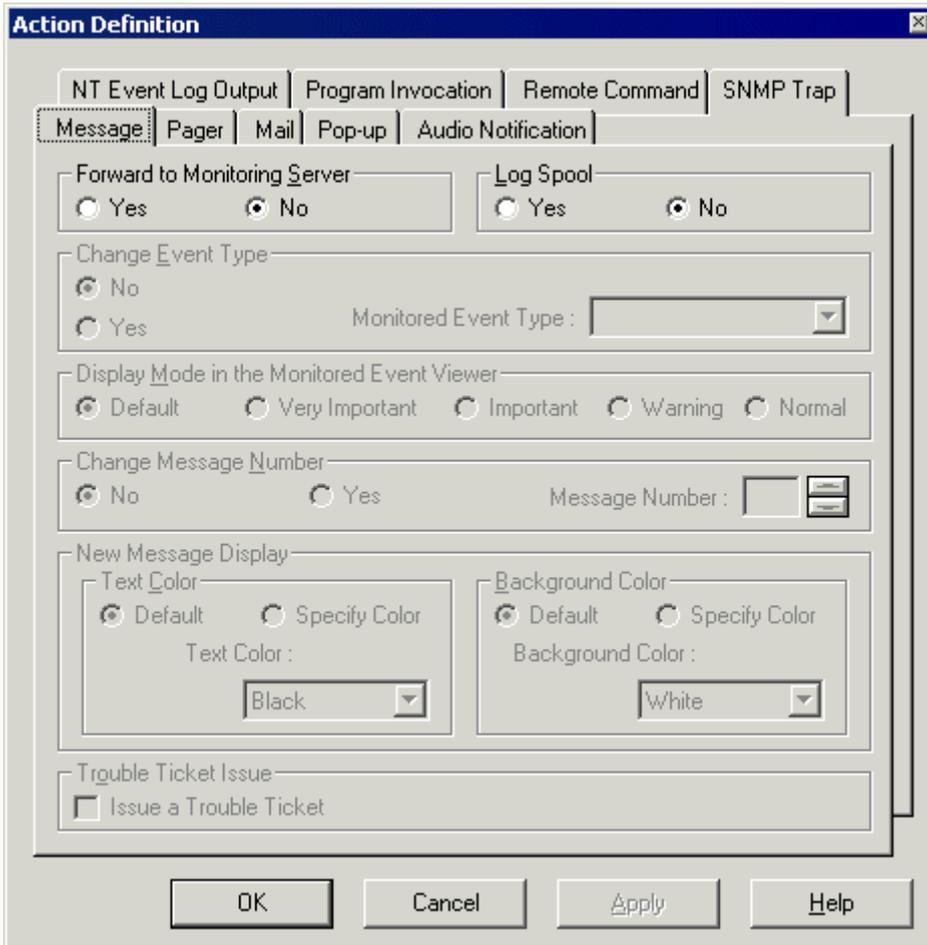
Device	Value
HP Surestore	enterprise:enterprises\.11\2\3\9\7\1 enterprise:enterprises\.11\2\3\9\7\2
ETERNUS LT200	enterprise:enterprises\.119\1\83\1\21
ETERNUS LT210/LT220/LT230	enterprise:enterprises\.119\1\83\1\1 enterprise:enterprises\.119\1\83\1\2
ETERNUS LT250	enterprise:aplNetStorage\3\5 or enterprise:enterprises\.211\4\1\1\126\3\5 (*1)
ETERNUS LT270	enterprise:aplNetStorage\3\2 or enterprise:enterprises\.211\4\1\1\126\3\2 (*1)
ETERNUS LT270 S2	enterprise:aplNetStorage\3\6 or enterprise:enterprises\.211\4\1\1\126\3\6 (*1)
NetApp FAS Series and V-Series	enterprise:enterprises\.789
Brocade Fibre Channel switch ETERNUS SN200 series Fibre Channel switch PRIMERGY Fibre Channel switch blade Brocade VDX series PRIMERGY BX Ethernet Fabric Switch	enterprise:enterprises\.1588\2\1\1
Performance Agent trap Device polling	enterprise:aplSANMgr or enterprise:enterprises\.211\4\1\3\21 (*1)
Cisco MDS ETERNUS SN200 MDS	enterprise:enterprises\.9\9\117\2 enterprise:enterprises\.9\9\289\1\3 enterprise:enterprises\.9\9\302\1\3 enterprise:enterprises\.9\9\91\2
McDATA FC switch	enterprise:enterprises\.289
Brocade Fibre Channel switch, ETERNUS SN200 series Fibre Channel switch, PRIMERGY Fibre Channel switch blade, Cisco MDS, SN200 MDS, McDATA FC-Switch common	enterprise:experimental\94 (*2)
ETERNUS VS850	enterprise:enterprises\.2\6\190
ETERNUS CS2000	enterprise:enterprises\.231\2\48\2\0

*1: Specify it when Systemwalker Centric Manager cannot recognize "aplNetStorage" or "aplSANMgr".

*2: The device not supported with Storage Cruiser includes the device which reports on SNMP Trap of this experimental\94 and the event of those devices is controlled.

3. Select [Action] - [Action Setting] for the event set in step 2.

The Action Definition dialog appears.



Select the [Message] tab, and define the following items:

Forward to Monitoring Server

Check "No"

Log Spool

Check "No"

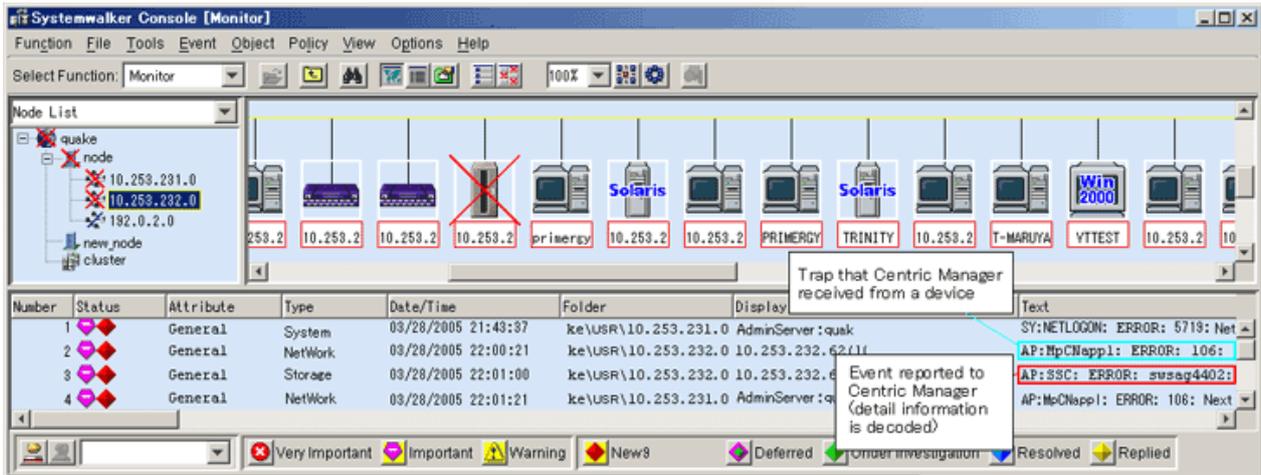
- Repeat steps 1 to 3 for each of the text messages in the "Table 10.1 Lists of text".

If the SNMP standard trap is reported as an event from a storage device, refer to the above description, and suppress transmission of the SNMP standard trap according to your operation mode.

10.1.4.3 Setting confirmation test

If the management device is an ETERNUS DX series, ETERNUS2000, ETERNUS4000, ETERNUS8000, or fibre channel switch device, a procedure and command are provided which allow you to check if the Systemwalker Centric Manager linkage is correctly set. Execute the "5.3 Checking Management Status" to check if it is properly running.

The figure below shows an example of the Systemwalker Centric Manager window displayed during event linkage with Systemwalker Centric Manager.



10.2 Linking with Systemwalker Service Quality Coordinator

Linkage with Systemwalker Service Quality Coordinator, Systemwalker Service Quality Coordinator can make use of performance information of storage devices and Fibre Channel switches.

Refer to the *Systemwalker Service Quality Coordinator User's Guide* or the *Systemwalker Service Quality Coordinator User's Guide* for the procedure for linkage.

Items that can be linked to Systemwalker Service Quality Coordinator

Fibre Channel switch

	Performance information (Unit)
Port	Transfer rates of send/receive data (MB/S)
	Number of CRC errors

ETERNUS Disk storage systems

	Performance information (Unit)
LUN LogicalVolume RAIDGroup	Read/Write count (IOPS)
	Read/Write data transfer rate (MB/S)
	Read/Write response time (msec)
	Read/Pre-fetch/Write cache hit rate (%)
Disk drive	Disk busy rate (%)
CM	Load (CPU usage) rate (%)

Note

- The performance information that can be managed depends on the version of Systemwalker Service Quality Coordinator.
- The ETERNUS SN200 MDS series Fibre Channel switch is not supported.
- The CM load (CPU usage) rate for ETERNUS DX400/DX400 S2 series, ETERNUS DX8000/DX8000 S2 series, ETERNUS4000 (models 400 and 600) and ETERNUS8000 (models 800, 1200 and 2200) includes the ROE load (CPU usage) rate.

10.3 Linkage with Other Administrative Software

Events can be sent to other administrative software.

The Shell/bat linkage function is used for such linkage. Refer to "[6.3 Event Display and Linkage](#)" for details.

Chapter 11 Command References

This chapter explains how to use commands.

11.1 Manager Commands

This section explains command operations on the Management Server for Solaris OS.

11.1.1 Commands for operating environment management

The following sub sections explain the commands for managing the operating environment.

11.1.1.1 sanadmsh chtraprcvip (SNMP Trap transmission place IP address change command)

NAME

sanadmsh chtraprcvip - changes SNMP Trap transmission place IP address

SYNOPSIS

```
sanadmsh chtraprcvip -h
```

```
sanadmsh chtraprcvip -all -oldip ol di paddr [-newip newi paddr]
```

```
sanadmsh chtraprcvip Devi ceID -oldip ol di paddr [-newip newi paddr]
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\bin\sanadmsh chtraprcvip
```

(\$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVssmgr/bin/sanadmsh chtraprcvip
```

DESCRIPTION

After the IP address of the Management Server is changed, delete the old IP address of the Management Server that is the SNMP Trap transmission place from the devices registered with this software, and add the new IP address.

In the Windows environment, only a user of the Administrators group can execute this command.

In the Solaris or Linux environment, only OS administrator (root) user can execute this command.

Although the SNMP Trap transmission place setting for a device may be changed with the Management Software on the device, this software provides this command to facilitate changing.

OPERANDS

DeviceID

Applies SNMP Trap transmission place setting to the limited devices. Specify the device type according to the following tables. Afterwards, specify how to recognize the device.

Device type	Device recognition method
-host -storage -library -switch -hub -bridge	One of which must be specified. - ip:IP address of a device - sysname:SysName name of a device SNMP setting - nickname:Device management name that is set for this software

OPTIONS

-h

Displays help about the argument format of this command.

-all

Applies SNMP Trap transmission place setting to all devices managed by this software. Executing the command specified with this argument outputs device names and execution results in execution order to the standard output. If the Management Server has more than one IP address, for example, the Management Server is connected to multiple subnets, a device may not be set with the correct SNMP Trap transmission place. After this setting is performed, check whether the correct Management Server address is set as the SNMP Trap transmission place setting on the device side.

-oldip *oldipaddr*

Specify the old IP address of the Management Server for *oldipaddr*. Delete this IP address from the SNMP transmission place address of managed devices.

-newip *newipaddr*

Specify the new IP address of the Management Server for *newipaddr*. Add this IP address to the SNMP transmission place address. If this option is omitted, the new IP address of the new Management Server is automatically specified. It is recommended to specify this option considering the Management Server that has multiple IP addresses.

USAGE

Execute the command after changing the IP address of Manager. The command may be executed for all devices managed by this software by the one command or for a specific device.

Devices that can be targets of the command are devices for which SNMP Trap transmission place settings can be defined automatically from this software.

The status of every target device must be Normal.

EXAMPLES

- Execute the SNMP Trap transmission place change on all managed devices that can automatically execute SNMP Trap transmission place setting.

```
> sanadmsh chtraprcvip -all -oldip 10.10.10.10 -newip 20.20.20.20
```

- Execute the SNMP Trap transmission place change on server nodes that sysname is defined in "host1".

```
> sanadmsh chtraprcvip -host sysname:host1 -oldip 10.10.10.10 -newip 20.20.20.20
```

11.1.1.2 swtraptest (SNMP Trap test for Fibre Channel switch)

NAME

swtraptest - tests of SNMP Trap

SYNOPSIS

```
swtraptest ipaddr
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\bin\swtraptest
```

(\$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVssmgr/bin/swtraptest
```

DESCRIPTION

This command checks whether this software can receive a SNMP Trap correctly, display an event, and cooperate with Systemwalker Centric Manager and Shell/Bat.

A simulated Fibre Channel switch SNMP Trap (FC Port fault) is created and issued to the Management Server.

OPERANDS

ipaddr

Specify the IPv4 address of the Fibre Channel switch which is to check the SNMP Trap setting by this command. IPv6 address cannot be specified.

The Fibre Channel switch must be a device managed by this software.

OPTIONS

None.

EXAMPLES

- Executing this command for the Fibre Channel switch whose IP address is 11.11.11.11

```
> swtraptest 11.11.11.11
```

NOTES

- Even the input IP address is not for a Fibre Channel switch device, this command can be executed. In this case, it executes as the event of device which IP address is input.
- Following Fibre Channel switch can be tested by using this command:
SN200 (Brocade), PRIMERGY switch blade, Brocade VDX series, PRIMERGY BX Ethernet Fabric Switch
- The SNMP Trap community name that is issued using this command, is fixed to "public".

11.1.1.3 grtraptest (SNMP Trap test for ETERNUS Disk storage system)

NAME

grtraptest - tests of SNMP Trap

SYNOPSIS

```
grtraptest ipaddr
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\bin\grtraptest
```

(\$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVssmgr/bin/grtraptest
```

DESCRIPTION

This command checks whether this software can receive a SNMP Trap correctly, display an event, and cooperate with Systemwalker Centric Manager and Shell/Bat.

A simulated SNMP Trap (FAN fault) for the ETERNUS Disk storage system is created within the Management Server and is issued to the Management Server itself.

OPERANDS

ipaddr

Specify the IPv4 address of the ETERNUS Disk storage system which is to check the SNMP Trap settings. IPv6 address cannot be specified.

The ETERNUS Disk storage system must be a device managed by this software.

OPTIONS

None.

EXAMPLES

- Executing this command for the ETERNUS Disk storage system whose IP address is 12.12.12.12.

```
> grtraptest 12.12.12.12
```

NOTES

- Following ETERNUS Disk storage systems can be tested by using this command:
ETERNUS DX series, ETERNUS2000, ETERNUS4000, and ETERNUS8000
- This command can be executed even if you have input the IP address for a device other than an ETERNUS Disk storage system. In that case, the command is executed as an event of the device corresponding to the designated IP address.

- The SNMP Trap community name that is issued using this command, is fixed to "public".

11.1.1.4 storageadm zone (Host affinity and zoning operation command)

NAME

storageadm zone - operates the host affinity and zoning

SYNOPSIS

```
storageadm zone add -storage cawwpn,affi ni tygroup -hba hbawwpn [-ipaddr i paddr[,i paddr]] [-hostrsp hostresponse] [-update all] [-f [-s]]
```

```
storageadm zone delete -storage cawwpn,affi ni tygroup -hba hbawwpn [-ipaddr i paddr[,i paddr]] [-update all] [-s]
```

```
storageadm zone info [-ipaddr i paddr[,i paddr,...]] [-check]] [-fast] [-csv] [-hex] [-hostresp]
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\sbin\storageadm zone
```

(*\$INS_DIR* means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVssmgr/sbin/storageadm zone
```

DESCRIPTION

This command is used to set/delete/display the storage device host affinity and Fibre Channel switch zoning.

In the Windows environment, only a user of the Administrators group can execute this command.

In the Solaris or Linux environment, only OS administrator (root) user can execute this command.

Specify the storage device CA WWPN, affinity group, and WWPN of the set HBA in the command parameter to set/delete the storage device host affinity and Fibre Channel switch zoning. The set host affinity and zoning is also displayed.

The target storage device and Fibre Channel switch must be devices managed by this software.

OPERANDS

add

This sets the host affinity and zoning.

delete

This deletes the host affinity and zoning.

info

This displays the host affinity and zoning.

OPTIONS

Options of the "add" operand

-storage *cawwpn,affinitygroup*

Designate the WWPN and affinity group number for the CA of the storage device for which host affinity is being set.

The CA WWPN is specified with a 16-character long hexadecimal number or a 23-character long hexadecimal number with each two digits separated by a colon (":"). For example, if separating the characters with colons, the WWPN is written in a manner such as "11:11:11:11:11:11:11:11".

The affinity group number is specified by a decimal or hexadecimal number. For example, specify affinity group number 16 as either "-storage 1111111111111111,16" in decimal notation or "-storage 1111111111111111,0x10" in hexadecimal notation.

-hba *hbawwpn*

Specify the WWPN for the HBA to be set to the host affinity and zoning.

The WWPN for the HBA is written with a 16-character long hexadecimal number or a 23-character long hexadecimal number with each two digits separated by a colon (":"). For example, if separating the characters with colons, the WWPN is written in a manner such as "22:22:22:22:22:22:22:22".

-ipaddr *ipaddr[,ipaddr]*

Set the IP address of a storage device and/or Fibre Channel switch. To specify the IP addresses of both devices, separate the two IP addresses with a comma (","). The two IP addresses can be specified in either order.

Specified device	Command action
Storage device	The command checks that the status allows for setting the host affinity to the affinity group of the CA for the storage device designated with the -storage option. The command sets the host affinity to the storage device only if the status allows the setting. If the status does not allow for the setting to be made, the command will terminate with an error.
Fibre Channel switch	The command checks that the status allows for setting the WWPN and zoning for the HBA specified with the -hba option within the fabric which includes the Fibre Channel switches connected to the CA of the storage device specified with the -storage option (i.e. all Fibre Channel switches connected in a cascade connection). The command sets the zoning to the Fibre Channel switch only if the status allows the setting. If the status does not allow the setting, the command will terminate with an error.
Both storage device and Fibre Channel switch	The command checks that the status allows you to set the host affinity or zoning to the respective devices. The command sets the host affinity and zoning only if the status allows for the settings to be made for both devices. If the status is such that the setting cannot be made to either of the devices, the command will terminate with an error.

-hostresp *hostresponse*

Specify the host response being used by the HBA.

If this option is omitted, the storage device's default host response will be set.

-update all

Specify this option to update the information this software is managing to the latest information after the completion of the setup. If this option is omitted, the information managed by this software will not be updated. To update the information, be sure to execute the "info" operand without specifying the -fast option.

This option is effective for when there are few settings needing to be updated. The "info" operand is effective for updating information after performing multiple settings at one time.

-f

Specify this option if forcibly setting WWPN zoning to a Fibre Channel switch in a status of not having zoning set up.

Check the security settings for the Fibre Channel switch when specifying this option. Specify this option only if setting WWPN zoning.

Moreover, if you specify this option under the conditions described below, the operand will be executed the same as if this option was omitted.

- If only a storage device is specified for the `-ipaddr` option
- If zoning is already set for the Fibre Channel switch to which you intend to set the zoning

-s

Continues the processing without a confirmation message being output.

This option can be specified only when the `-f` option is specified.

Options of the "delete" operand

-storage *cawwpn,affinitygroup*

Designate the WWPN and affinity group number for the CA of the storage device for which host affinity is being deleted.

The CA WWPN is specified with a 16-character long hexadecimal number or a 23-character long hexadecimal number with each two digits separated by a colon (":"). For example, if separating the characters with colons, the WWPN is written in a manner such as "11:11:11:11:11:11:11:11".

The affinity group number is specified by a decimal or hexadecimal number. For example, specify affinity group number 16 as either "-storage 1111111111111111,16" in decimal notation or "-storage 1111111111111111,0x10" in hexadecimal notation.

-hba *hbawwpn*

Specify the WWPN for the HBA from which the host affinity and zoning to be deleted.

The WWPN for the HBA is written with a 16-character long hexadecimal number or a 23-character long hexadecimal number with each two digits separated by a colon (":"). For example, if separating the characters with colons, the WWPN is written in a manner such as "22:22:22:22:22:22:22:22".

-ipaddr *ipaddr[,ipaddr]*

Set the IP address of a storage device and/or Fibre Channel switch. To specify the IP addresses of both devices, separate the two IP addresses with a comma (","). The two IP addresses can be specified in either order.

Specified device	Command action
Storage device	The command checks that the status allows for deleting the host affinity from the affinity group of the CA for the storage device designated with the <code>-storage</code> option. The command deletes the host affinity from the storage device only if the status allows the deletion. If the status does not allow the deletion, the command will terminate with an error.
Fibre Channel switch	The command checks that the status allows for deleting the WWPN and zoning for the HBA specified with the <code>-hba</code> option within the fabric which includes the Fibre Channel switches connected to the CA of the storage device specified with the <code>-storage</code> option (i.e. all Fibre Channel switches connected in a cascade connection). The command deletes the zoning to the Fibre Channel switch only if the status allows the deletion. If the status does not allow the deletion, the command will terminate with an error.
Both storage device and Fibre Channel switch	The command checks that the status allows for deleting the host affinity or zoning from the respective devices. The command deletes the host affinity and zoning only if the status allows for the deletion for both devices. If the status is such that the deletion cannot be made to either of the devices, the command will terminate with an error.

-update all

Specify this option to update the information this software is managing to the latest information after the completion of the setup. If this option is omitted, the information managed by this software will not be updated. To update the information, be sure to execute the "info" operand without specifying the `-fast` option specified.

This option is effective for when there are few deletion. The "info" operand is effective for updating information after performing multiple deletions at one time.

-s

Processing continues without output of a confirmation message.

Options of the "info" operand

-ipaddr *ipaddr[,ipaddr, ...]*

Displays the zoning information for the Fibre Channel switches corresponding to the specified IP addresses or host affinity information for the host affinities set to the CA of the storage devices. To display information for multiple storage devices and Fibre Channel switches, specify the IP addresses separated by comma (",").

If this option is omitted, the operand will display the information for all storage devices and Fibre Channel switches registered with this software.

However, the operand will display information for the following storage devices which as not registered with this software (but detected).

- ETERNUS DX60/DX60 S2/DX80/DX90
- ETERNUS DX400 series
- ETERNUS DX8000 series
- ETERNUS2000
- ETERNUS4000
- ETERNUS8000

-check

Checks that the devices specified with the -ipaddr option are storage devices or Fibre Channel switches which are registered to this software.

However, the specified devices will be included for display even if they have not been registered with this software (but detected) if they are one of the following devices.

- ETERNUS DX60/DX60 S2/DX80/DX90
- ETERNUS DX400 series
- ETERNUS DX8000 series
- ETERNUS2000
- ETERNUS4000
- ETERNUS8000

Checks that the status allows for display of the information. The information for the designated devices is displayed only if the status allows for it. If the status does not allow for information to be displayed or if the devices are not devices applicable to this display, the command will terminate with an error.

This option can be specified when the -ipaddr option is specified.

-fast

Specify this to display storage device and Fibre Channel switch information from the existing information managed by this software. If this option is omitted, the storage device and Fibre Channel switch information will be displayed after the information managed by this software has been updated to the latest information.

This option is effective for displaying information after you have executed the "add" operand or the "delete" operand with the -update all option specified.

-csv

Displays the storage device and Fibre Channel switch information in CSV format.

If this option is omitted, the information is displayed in a table format.

-hex

Specify this to display the storage device and Fibre Channel switch information in hexadecimal format. If this option is specified, the affinity group numbers for storage devices will be displayed in hexadecimal format.

-hostresp

If this option is specified, the host response number used by the HBA and the host response's alias name will be displayed. If this option is omitted, the host response number and host response alias name, including the table border and column names will not be displayed.

EXAMPLES

- Adding the host affinity and zoning

```
> storageadm zone add -storage 1111111111111111,3 -hba 2222222222222222
```

- Deleting the host affinity and zoning

```
> storageadm zone delete -storage 1111111111111111,3 -hba 2222222222222222
```

- Displaying the host affinity and zoning

```
> storageadm zone info
<<< FC Switch Zone Information >>>
DEVICE_NAME(IP_ADDRESS)      ZONE_NAME      ZONE_WWPN
-----
Switch1(10.10.10.10)         SNM_0001       1111111111111111;2222222222222222
                               SNM_0002       3333333333333333;4444444444444444
-----
```

```
<<< FC CA Zone Information >>>
DEVICE_NAME(IP_ADDRESS)      CA_WWPN        AFFINITY_GROUP  HBA_WWPN
-----
E4000M300(10.10.10.11)      1111111111111111 3                2222222222222222
-----
```

- Displaying the host affinity and zoning in CSV format and in hexadecimal format.

```
> storageadm zone info -csv -hex
DEVICE_NAME(IP_ADDRESS),ZONE_NAME,ZONE_WWPN
Switch1(10.10.10.10),SNM_0001,1111111111111111;2222222222222222
,SNM_0002,3333333333333333;4444444444444444

DEVICE_NAME(IP_ADDRESS),CA_WWPN,AFFINITY_GROUP,HBA_WWPN
E4000M300(10.10.10.11),1111111111111111,0x0003,2222222222222222
```

NOTES

- The storage device and Fibre Channel switch for which set/delete/display is performed must have been registered with this software. However, the information for the following storage devices which are not registered with the software (but detected) is displayed.
 - ETERNUS DX60/DX60 S2/DX80/DX90
 - ETERNUS DX400 series
 - ETERNUS DX8000 series
 - ETERNUS2000
 - ETERNUS4000
 - ETERNUS8000

This command cannot be used to register Fibre Channel switches if zoning has not been set. Create a temporary zone and then register the Fibre Channel switch with this software. Refer to "Zoning setting" in "Setting" of the target device of "[4.2 Fibre Channel switch](#)" for details on creating a temporary zone.

By specifying the -f option, you can forcibly set zoning even to those Fibre Channel switches for which zoning has not been set.

However, if you have created a temporary zone or performed a forcible setting using the -f option, all access except to the zoning specified with the -f option will be blocked. Therefore, be sure not to perform this task while the environment for the target Fibre Channel switch is operating. Perform this task either before starting the operation of the environment after the installation of the Fibre Channel switch environment or while the operation of the environment is stopped.

- If the server node which includes the HBA specified with the -hba option is registered with this product, check that the status of the server node is as follows before executing this command:
 - The server had to have started when the "add" operand was specified.
 - The server had to have stopped when the "delete" operand was specified.
- The zoning for the Fibre Channel switch is set within the fabric which includes the Fibre Channel switches connected to the CA of the specified storage device (i.e. all Fibre Channel switches connected in a cascade connection) to the fibre switches equipped with the latest firmware.
- The Fibre Channel switch and storage device must be connected using a Fibre Channel cable. If the Fibre Channel cable is not connected, Fibre Channel switch zoning is not set. Connect the Fibre Channel cable, and then re-execute the command.
- Zone settings (AffinityGroup creation) must be configured in the ETERNUS Disk storage system in advance, using ETERNUS Web GUI.
- Only the ETERNUS SN200 (except model 250M) and Brocade (except AP7420) Fibre Channel switch, PRIMERGY Fibre Channel switch blades, Brocade VDX series and PRIMERGY BX Ethernet Fabric Switch are supported.
- A confirmation message will be output in the situation below. Enter "y" to continue or "n" to cancel. The confirmation message can be surpass by specifying the -s option.
 - If the -f option is specified with the "add" operand but -s option is not specified.
 - If the -s option is not specified with the "delete" operand.

A confirmation message is as follows:

```
Are you sure? [y/n]:
```

11.1.1.5 storageadm iscsizone (Host affinity operation command)

NAME

storageadm iscsizone - operates iSCSI host affinity

SYNOPSIS

```
storageadm iscsizone add -ipaddr i paddr -storage {port_i paddr, port_i scsi_name, affi ni tygroup |  
portID, affi ni tygroup} -server {server_port_i paddr, server_port_i scsi_name | server_port_i scsi_name} [-  
svalias server_ali as] [-svname server_name] [-svhostrsp server_hostresponse] [-check]
```

```
storageadm iscsizone delete -ipaddr i paddr -storage {port_i paddr, port_i scsi_name, affi ni tygroup |  
portID, affi ni tygroup} -server {server_port_i paddr, server_port_i scsi_name | server_port_i scsi_name} [-  
check] [-s]
```

```
storageadm iscsizone info [-ipaddr i paddr[, i paddr, ...] [-check]] [-csv] [-hex] [-expand]
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\sbin\storageadm iscsizone
```

(\$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVssmgr/sbin/storageadm iscsizone
```

DESCRIPTION

This command is used to set, delete, and display the host affinity of the storage device iSCSI.

In the Windows environment, only a user of the Administrators group can execute this command.

In the Solaris or Linux environment, only OS administrator (root) user can execute this command.

In the command operands, specify the IP address and iSCSI name of the storage device iSCSI port, the affinity group, and the IP address and iSCSI name of the server being set. Use these operands to set and delete the host affinity of the storage device and to display the host affinity that is set.

The targeted storage device must be a device managed by this software.

OPERANDS

add

This sets the host affinity.

delete

This deletes the host affinity.

info

This displays the host affinity.

OPTIONS

Options of the add operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-storage {*port_ipaddr,port_iscsi_name,affinitygroup* | *portID,affinitygroup*}

Specify the iSCSI port IP address and iSCSI name of the storage device for which the host affinity is set and the affinity group number, or specify the port ID and the affinity group number.

Specify the affinity group number as a decimal or hexadecimal number. Specification example is as follows:

```
[Decimal specification]
-storage 172.16.4.38,iqn.2000-09.com.fujitsu:storage-system.e2000:0000000029,3

[Hexadecimal specification]
-storage 172.16.4.38,iqn.2000-09.com.fujitsu:storage-system.e2000:0000000029,0x3
```

For ETERNUS DX60/DX60 S2/DX80/DX90, the port ID is the CM number and the port number entered.

For ETERNUS DX80 S2/DX90 S2, ETERNUS DX400/DX400 S2 series, ETERNUS DX8000/DX8000 S2 series, ETERNUS4000, and ETERNUS8000, the port ID is the CM number, the CA number and the port number entered. Specification example is as follows:

```
[To specify CM number 1, CA number 2, port number 1, and affinity group number 6]
-storage 121,6
```

`-server {server_port_ipaddr,server_port_iscsi_name | server_port_iscsi_name}`

Specify the iSCSI port IP address and the iSCSI name of the server for which the host affinity is set.

If the device supports non-setting of the iSCSI host IP address, the server can be specified with the iSCSI host IP address omitted.

`-svalias server_alias`

This specifies the iSCSI alias of the server being set for the host affinity.

If this option is omitted, an alias is not set.

`-svname server_name`

This specifies the host alias of the server being set for the host affinity.

An alias cannot be set at the ETERNUS4000 models 400 and 600, and ETERNUS8000 models 800, 1200 and 2200 that do not support aliases. If set, the alias causes an error.

If this option is omitted, the specification is as follows:

Storage device	Specification when this option is omitted
ETERNUS DX60/DX60 S2 ETERNUS DX80/DX80 S2 ETERNUS DX90/DX90 S2 ETERNUS DX400 S2 series ETERNUS DX8000 S2 series	An alias is set automatically.
ETERNUS DX400 series ETERNUS DX8000 series	An alias is not set.

`-svhostrsp server_hostresponse`

This specifies the host response number of the server being set for the host affinity.

If this option is omitted, then host response number #0 is set.

`-check`

This checks whether the server specified in the `-server` option is already set as the host affinity setting for the device at the IP address specified in the `-ipaddr` option. If it is not already set as the host affinity, processing continues and the host affinity is set. If it is already set as the host affinity, an error occurs.

If this option is omitted, processing continues without checking.

Options of the delete operand

`-ipaddr ipaddr`

Specify the IP address of the storage device.

`-storage {port_ipaddr,port_iscsi_name,affinitygroup | portID,affinitygroup}`

Specify the iSCSI port IP address and iSCSI name of the storage device for which the host affinity is being deleted and the affinity group number, or specify the port ID and the affinity group number.

Specify the affinity group number as a decimal or hexadecimal number. Specification example is as follows:

```
[Decimal specification]
-storage 172.16.4.38,iqn.2000-09.com.fujitsu:storage-system.e2000:0000000029,3

[Hexadecimal specification]
-storage 172.16.4.38,iqn.2000-09.com.fujitsu:storage-system.e2000:0000000029,0x3
```

For ETERNUS DX60/DX60 S2/DX80/DX90, the port ID is the CM number and the port number entered.

For ETERNUS DX80 S2/DX90 S2, ETERNUS DX400/DX400 S2 series, ETERNUS DX8000/DX8000 S2 series, ETERNUS4000, and ETERNUS8000, the port ID is the CM number, the CA number and the port number entered. Specification example is as follows:

```
[To specify CM number 1, CA number 2, port number 1, and affinity group number 6]
-storage 121,6
```

`-server {server_port_ipaddr,server_port_iscsi_name | server_port_iscsi_name}`

Specify the iSCSI port IP address and the iSCSI name of the server for which the host affinity is being deleted.

If the device supports non-setting of the iSCSI host IP address, the server can be specified with the iSCSI host IP address omitted.

`-check`

This checks whether the server specified in the `-server` option is already set as the host affinity setting for the device at the IP address specified in the `-ipaddr` option. If it is not already set as the host affinity, an error occurs. If it is already set as the host affinity, processing continues and the setting is deleted.

If this option is omitted, processing continues without checking.

`-s`

Processing continues without output of a confirmation message.

Options of the info operand

`-ipaddr ipaddr`

This displays the host affinity information of the storage device at the specified IP address. To display information of multiple storage devices, specify the IP addresses successively, separated by commas (",").

If this option is omitted, information is displayed for all the storage devices registered with this software.

However, the information for the following storage devices which are not registered with the software (but detected) is displayed.

- ETERNUS DX60/DX60 S2/DX80/DX90
- ETERNUS DX400 series
- ETERNUS DX8000 series
- ETERNUS2000
- ETERNUS4000
- ETERNUS8000

`-check`

This checks whether the devices at the IP address specified in the `-ipaddr` option are storage devices registered with this software. If all devices at the specified IP address are registered with this software, processing continues and the setting information is displayed. If at least one device at the specified IP address is not registered with this software, an error occurs.

If this option is omitted, processing continues without checking.

When a device whose IP address has been specified is one of the following, the process continues and the setting information is displayed even if it has not been registered with this software (but detected).

- ETERNUS DX60/DX60 S2/DX80/DX90
- ETERNUS DX400 series
- ETERNUS DX8000 series
- ETERNUS2000
- ETERNUS4000
- ETERNUS8000

This option can be specified only when the `-ipaddr` option is specified.

`-csv`

Output is in CSV format.

`-hex`

The affinity group number is displayed as a hexadecimal number.

`-expand`

This adds the following to the host affinity information to display:

- IPv6 link local address
- IPv6 connection IP address

Added information depends on the version of the ETERNUS SF system. Upgrading the version of the ETERNUS SF system may increase displayed information.

When this option is omitted, a list of host affinities is displayed.

EXAMPLES

- Add a host affinity.

```
> storageadm iscsizone add -ipaddr 1.2.3.4 -storage 172.16.4.38,iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029,3 -server 172.16.4.198,eui.22222222222222222222 -svalias alias2222 -svname
name2222 -svhostrsp 2
INFO:swsag0001:Command terminated normally.
```

- Delete a host affinity.

```
> storageadm iscsizone delete -ipaddr 1.2.3.4 -storage 172.16.4.38,iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029,3 -server 172.16.4.198,eui.22222222222222222222
INFO:swsag0001:Command terminated normally.
```

- Display the host affinity in table format.

```
> storageadm iscsizone info -ipaddr 1.2.3.4
<<< iSCSI CA Zone Information >>>
DEVICE NAME(IP ADDRESS)          PORT ID  ISCSI CA IP ADDRESS  ISCSI CA ISCSI NAME  AFFINITY GROUP  SERVER IP ADDRESS  SERVER ISCSI NAME
-----
DX60(1.2.3.4)                    00     172.16.4.38  iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029 6 172.16.4.198 eui.22222222222222222222
                                01     172.16.4.39  iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029 6 172.16.4.198 eui.22222222222222222222
                                01     172.16.4.39  iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029 6 172.16.4.199 eui.33333333333333333333
                                10     172.16.4.40  iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029 - - -
                                11     172.16.4.41  iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029 - - -
E4000(1.2.3.5)                   000    172.16.4.38  iqn.2000-09.com.fujitsu:storage-
system.e4000:0000000001 3 172.16.4.198 eui.22222222222222222222
                                120    172.16.4.40  iqn.2000-09.com.fujitsu:storage-
system.e4000:0000000001 3 172.16.4.158 eui.44444444444444444444
-----
INFO:swsag0001:Command terminated normally.
```

- Display the host affinity in CSV format.

```
> storageadm iscsizone info -ipaddr 1.2.3.4 -csv
DEVICE NAME(IP ADDRESS),PORT ID,ISCSI CA IP ADDRESS,ISCSI CA ISCSI NAME,AFFINITY GROUP,SERVER IP
ADDRESS,SERVER ISCSI NAME
DX60(1.2.3.4),00,172.16.4.38,iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029,6,172.16.4.198,eui.22222222222222222222
,01,172.16.4.39,iqn.2000-09.com.fujitsu:storage-system.e2000:0000000029,6,172.16.4.198,eui.
22222222222222222222
,01,172.16.4.39,iqn.2000-09.com.fujitsu:storage-system.e2000:0000000029,6,172.16.4.199,eui.
33333333333333333333
,10,172.16.4.40,iqn.2000-09.com.fujitsu:storage-system.e2000:0000000029,-,-,
,11,172.16.4.41,iqn.2000-09.com.fujitsu:storage-system.e2000:0000000029,-,-,
E4000(1.2.3.5),000,172.16.4.38,iqn.2000-09.com.fujitsu:storage-
system.e4000:0000000001,3,172.16.4.198,eui.22222222222222222222
```

```
,120,172.16.4.38,iqn.2000-09.com.fujitsu:storage-system.e4000:0000000001,3,172.16.4.158,eui.4444444444444444
```

- Display the host affinity in table format including additional information.

```
> storageadm iscsizone info -ipaddr 1.2.3.4 -expand
<<< iSCSI CA Zone Information >>>
DEVICE NAME(IP ADDRESS)      PORT ISCSI CA      ISCSI CA      AFFINITY SERVER
SERVER                        ISCSI CA LINK LOCAL IP ADDRESS      ISCSI CA CONNECT IP ADDRESS
                               ID   IP ADDRESS      ISCSI NAME      GROUP   IP ADDRESS      ISCSI NAME
-----
DX60(1.2.3.4)                00   172.16.4.38     iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029 6 172.16.4.198 eui.22222222222222222222 fe80::128c:24d8:3016:250a:
56ff:fe67:a524 2001:100a:ab13:cd24:ef3f:db72:fe11:cd21
                               01   172.16.4.39     iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029 6 172.16.4.198 eui.22222222222222222222 fe80::128c:24d8:3016:250a:
56ff:fe67:a525 2001:100a:ab13:cd24:ef3f:db72:fe11:cd22
                               01   172.16.4.39     iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029 6 172.16.4.199 eui.33333333333333333333 fe80::128c:24d8:3016:250a:
56ff:fe67:a525 2001:100a:ab13:cd24:ef3f:db72:fe11:cd22
                               10   172.16.4.40     iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029 - - - -
                               11   172.16.4.41     iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029 - - - -
E4000(1.2.3.5)                000 172.16.4.38     iqn.2000-09.com.fujitsu:storage-
system.e4000:0000000001 3 172.16.4.198 eui.22222222222222222222 fe80::254b:781a:4b35:c531:1a3d:198e:
30c6 2001:100a:451f:fd32:230b:12ac:dd2a:a2e5
                               120 172.16.4.40     iqn.2000-09.com.fujitsu:storage-
system.e4000:0000000001 3 172.16.4.158 eui.44444444444444444444 fe80::254b:781a:4b35:c531:1a3d:198e:
30d5 2001:100a:451f:fd32:230b:12ac:dd2a:a289
-----
INFO:swsag0001:Command terminated normally.
```

- Display the host affinity in CSV format including additional information.

```
> storageadm iscsizone info -ipaddr 1.2.3.4 -expand -csv
DEVICE NAME(IP ADDRESS),PORT ID,ISCSI CA IP ADDRESS,ISCSI CA ISCSI NAME,AFFINITY GROUP,SERVER IP
ADDRESS,SERVER ISCSI NAME, ISCSI CA LINK LOCAL IP ADDRESS,ISCSI CA CONNECT IP ADDRESS
DX60(1.2.3.4),00,172.16.4.38,iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029,6,172.16.4.198,eui.22222222222222222222,fe80::128c:24d8:3016:250a:
56ff:fe67:a524,2001:100a:ab13:cd24:ef3f:db72:fe11:cd21
DX60(1.2.3.4),01,172.16.4.39,iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029,6,172.16.4.198,eui.22222222222222222222,fe80::128c:24d8:3016:250a:
56ff:fe67:a525,2001:100a:ab13:cd24:ef3f:db72:fe11:cd22
DX60(1.2.3.4),01,172.16.4.39,iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029,6,172.16.4.199,eui.33333333333333333333,fe80::128c:24d8:3016:250a:
56ff:fe67:a525,2001:100a:ab13:cd24:ef3f:db72:fe11:cd22
DX60(1.2.3.4),10,172.16.4.40,iqn.2000-09.com.fujitsu:storage-system.e2000:0000000029,-,-,-,-
DX60(1.2.3.4),11,172.16.4.41,iqn.2000-09.com.fujitsu:storage-system.e2000:0000000029,-,-,-,-
E4000(1.2.3.5),000,172.16.4.38,iqn.2000-09.com.fujitsu:storage-
system.e4000:0000000001,3,172.16.4.198,eui.22222222222222222222,fe80::254b:781a:4b35:c531:1a3d:198e:
30c6,2001:100a:451f:fd32:230b:12ac:dd2a:a2e5
E4000(1.2.3.5),120,172.16.4.38,iqn.2000-09.com.fujitsu:storage-
system.e4000:0000000001,3,172.16.4.158,eui.44444444444444444444,fe80::254b:781a:4b35:c531:1a3d:198e:
30d5,2001:100a:451f:fd32:230b:12ac:dd2a:a289
```

NOTES

- Storage devices must be registered with this software in order to add, delete, and display settings. However, the information for the following storage devices which are not registered with the software (but detected) is displayed.
 - ETERNUS DX60/DX60 S2/DX80/DX90
 - ETERNUS DX400 series
 - ETERNUS DX8000 series
 - ETERNUS2000
 - ETERNUS4000
 - ETERNUS8000
- Zone settings (Affinity group creation) must be configured in the ETERNUS Disk storage system in advance, using ETERNUS Web GUI.
- The message below is displayed when the "delete" operand is specified. Enter "y" to continue, or "n" to cancel. Note that this message is not displayed if the -s option is specified.

Are you sure? [y/n]:

11.1.1.6 storageadm perfdata (Performance information operation command)

NAME

storageadm perfdata - operates the performance information

SYNOPSIS

```
storageadm perfdata export outdirname -ipaddr ipaddr [-date start_time[-end_time]]
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\sbin\storageadm perfdata
```

(\$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVssmgr/sbin/storageadm perfdata
```

DESCRIPTION

This command outputs the performance information of the storage devices and Fibre Channel switches.

In the Windows environment, only a user of the Administrators group can execute this command.

In the Solaris or Linux environment, only OS administrator (root) user can execute this command.

By specifying the IP address of the device that outputs the performance information and the date in the command operand, the storage device and Fibre Channel switch performance information is output in CSV format.

The target storage device and Fibre Channel switch must be devices managed by this software when performance monitoring is either still running or already completed.

The supported devices are as follows:

- ETERNUS DX series, ETERNUS2000, ETERNUS4000, ETERNUS8000

- The Fibre Channel switches and Fibre Channel switch blades which support the performance monitoring.

The details of CSV files are as follows.

The port information of Fibre Channel switch

Items	Explanation
File name	PORT.csv
Header line	<ul style="list-style-type: none"> - Case of ETERNUS SN200 series or Brocade Fibre Channel switch Date,PortX - Tx Throughput, PortX - Rx Throughput, PortX - CRC Error, ... - Case of ETERNUS SN200 MDS series Date,PortX - Tx Throughput, fcX/X - Rx Throughput, fcX/X - CRC Error, ...
Data line	<p><i>date,port0s,port0r,port0e, ... ,portNs,portNr,portNe</i></p> <p>The following information is output for each field. After <i>date</i>, the information is repeated for the actual number of ports.</p> <p><i>date</i> : Performance Information Acquisition Time (YYYY/MM/DD hh:mm:ss format) <i>port0s</i> : Port0 Transfer rates of send data at <i>date</i> (Decimal notation. The unit is MB/S.) <i>port0r</i> : Port0 Transfer rates of receive data at <i>date</i> (Decimal notation. The unit is MB/S.) <i>port0e</i> : Port0 Number of CRC errors at <i>date</i> (Decimal notation. The unit is Count.) <i>portNs</i> : PortN Transfer rates of send data at <i>date</i> (Decimal notation. The unit is MB/S.) <i>portNr</i> : PortN Transfer rates of receive data at <i>date</i> (Decimal notation. The unit is MB/S.) <i>portNe</i> : PortN Number of CRC errors at <i>date</i> (Decimal notation. The unit is Count.)</p>

The CM performance information of storage device

ETERNUS DX60/DX60 S2/DX80/DX80 S2/DX90/DX90 S2, ETERNUS2000, ETERNUS4000 models 300 and 500, ETERNUS8000 models 700, 900, 1100 and 2100

Items	Explanation
File name	CM.csv
Header line	Date, CM0xXX:CPUX - CPU Use Rate, CM0xXX:CPUX - Copy Remain, ...
Data line	<p><i>date,CM00u,CM00r, ... ,CMNNu,CMNNr</i></p> <p>The following information is output for each field. After <i>date</i>, the information is repeated for the actual number of CMs.</p> <p><i>date</i> : Performance Information Acquisition Time (YYYY/MM/DD hh:mm:ss format) <i>CM00u</i> : CM0x00:CPU0 (*1) CPU Load at <i>date</i> (Decimal notation. The unit is %.) <i>CM00r</i> : CM0x00:CPU0 (*1) CM Copy remaining amount at <i>date</i> (Decimal notation. The unit is GB.) <i>CMNNu</i> : CM0xNN:CPUN (*1) CPU Load at <i>date</i> (Decimal notation. The unit is %.) <i>CMNNr</i> : CM0xNN:CPUN (*1) CM Copy remaining amount at <i>date</i> (Decimal notation. The unit is GB.)</p>

*1: The CPU number is not output when the storage device is ETERNUS DX60/DX60 S2/DX80/DX80 S2/DX90/DX90 S2 or ETERNUS2000.

ETERNUS DX400/DX400 S2 series, ETERNUS DX8000/DX8000 S2 series, ETERNUS4000 models 400 and 600, ETERNUS8000 models 800, 1200 and 2200

Items	Explanation
File name	<p>CM/<i>nnnn</i>.csv</p> <p>(<i>nnnn</i> indicates the CM number by hexadecimal notation. CM numbers are assigned in ascending order, starting with 0000 for the lowest CM CPU number in the device.)</p> <p>CM0x0 CPU0 is 0000, CM0x0 CPU1 is 0001, CM0x1 CPU0 is 0002, CM0x1 CPU1 is 0003,</p>

Items	Explanation
	: CM0x7 CPU0 is 000E, CM0x7 CPU1 is 000F.)
Header line	Date, CM0xXX:CPUX - CPU Use Rate, CM0xXX:CPUX(ROE) - CPU Use Rate, CM0xXX:CPUX - Copy Remain
Data line	<i>date,cpu,roe,remain</i> The following information is output for each field. <i>date</i> : Performance Information Acquisition Time (YYYY/MM/DD hh:mm:ss format) <i>cpu</i> : CM0xXX:CPUX CPU Load at <i>date</i> (Decimal notation. The unit is %.) <i>roe</i> : CM0xXX:CPUX ROE Load at <i>date</i> (Decimal notation. The unit is %.) <i>remain</i> : CM0xXX:CPUX CM Copy remaining amount at <i>date</i> (Decimal notation. The unit is GB.)

The LogicalVolume performance information of storage device

Items	Explanation
File name	LogicalVolume/ <i>nnnn</i> .csv (<i>nnnn</i> indicates the LogicalVolume number by hexadecimal notation.)
Header line	Date, LogicalVolume0xXXXX - Read IOPS, LogicalVolume0xXXXX - Write IOPS, LogicalVolume0xXXXX - Read Throughput, LogicalVolume0xXXXX - Write Throughput, LogicalVolume0xXXXX - Read Response Time, LogicalVolume0xXXXX - Write Response Time, LogicalVolume0xXXXX - Read Cache Hit Rate, LogicalVolume0xXXXX - Write Cache Hit Rate, LogicalVolume0xXXXX - Prefetch Cache Hit Rate,
Data line	<i>date,read,write,through-r,through-w,resp-r,resp-w,hit-r,hit-w,fetch</i> The following information is output for each field. <i>date</i> : Performance Information Acquisition Time (YYYY/MM/DD hh:mm:ss format) <i>read</i> : Read Count at <i>date</i> (Decimal notation. The unit is IOPS.) <i>write</i> : Write Count at <i>date</i> (Decimal notation. The unit is IOPS.) <i>through-r</i> : Read data transfer rate at <i>date</i> (Decimal notation. The unit is MB/S.) <i>through-w</i> : Write data transfer rate at <i>date</i> (Decimal notation. The unit is MB/S.) <i>resp-r</i> : Read Response Time at <i>date</i> (Decimal notation. The unit is msec.) <i>resp-w</i> : Write Response Time at <i>date</i> (Decimal notation. The unit is msec.) <i>hit-r</i> : Read Cache Hit Rate at <i>date</i> (Decimal notation. The unit is %.) <i>hit-w</i> : Write Cache Hit Rate at <i>date</i> (Decimal notation. The unit is %.) <i>fetch</i> : Read Pre-fetch Cache Hit Rate at <i>date</i> (Decimal notation. The unit is %.)

The RAID group performance information of storage device

Items	Explanation
File name	RAIDGroup/ <i>nnnn</i> .csv (<i>nnnn</i> indicates the RAID group number by hexadecimal notation.)
Header line	Date, RAIDGroup0x0xXXXX - Read IOPS, RAIDGroup0x0xXXXX - Write IOPS, RAIDGroup0x0xXXXX - Read Throughput, RAIDGroup0x0xXXXX - Write Throughput, RAIDGroup0x0xXXXX - Read Response Time, RAIDGroup0x0xXXXX - Write Response Time, RAIDGroup0x0xXXXX - Read Cache Hit Rate, RAIDGroup0x0xXXXX - Write Cache Hit Rate, RAIDGroup0x0xXXXX - Prefetch Cache Hit Rate,
Data line	<i>date,read,write,through-r,through-w,resp-r,resp-w,hit-r,hit-w,fetch</i> The following information is output for each field. <i>date</i> : Performance Information Acquisition Time (YYYY/MM/DD hh:mm:ss format) <i>read</i> : Read Count at <i>date</i> (Decimal notation. The unit is IOPS.) <i>write</i> : Write Count at <i>date</i> (Decimal notation. The unit is IOPS.) <i>through-r</i> : Read data transfer rate at <i>date</i> (Decimal notation. The unit is MB/S.) <i>through-w</i> : Write data transfer rate at <i>date</i> (Decimal notation. The unit is MB/S.) <i>resp-r</i> : Read Response Time at <i>date</i> (Decimal notation. The unit is msec.)

Items	Explanation
	<i>resp-w</i> : Write Response Time at <i>date</i> (Decimal notation. The unit is msec.) <i>hit-r</i> : Read Cache Hit Rate at <i>date</i> (Decimal notation. The unit is %.) <i>hit-w</i> : Write Cache Hit Rate at <i>date</i> (Decimal notation. The unit is %.) <i>fetch</i> : Read Pre-fetch Cache Hit Rate at <i>date</i> (Decimal notation. The unit is %.)

The Disk performance information of storage device

Items	Explanation
File name	Disk/ <i>nnnn</i> .csv (<i>nnnn</i> indicates the DE number by hexadecimal notation.)
Header line	<ul style="list-style-type: none"> - For disk mounted on CE: Date, CE(DE0x00):DiskX - busy time, ... - For disk mounted on DE: Date, DE0xXX:DiskX - busy time, ...
Data line	<i>date</i> , <i>Disk0</i> , ... , <i>DiskN</i> The following information is output for each field. (After <i>date</i> , the information is repeated for the actual number of Disks.) <i>date</i> : Performance Information Acquisition Time (YYYY/MM/DD hh:mm:ss format) <i>Disk0</i> : Disk0 Disk busy rate at <i>date</i> (Decimal notation. The unit is %.) <i>DiskN</i> : DiskN Disk busy rate at <i>date</i> (Decimal notation. The unit is %.)

The CA/CM Port performance information of storage device

Items	Explanation
File name	Port/ <i>nnnn</i> .csv (<i>nnnn</i> indicates the CA/CM Port number by hexadecimal notation. CA/CM port numbers are assigned in ascending order, starting with 0000 for the lowest CA/CM port number in the device. CM0x0 CA0x0 Port0 is 0000, CM0x0 CA0x0 Port1 is 0001, : CM0x7 CA0x3 Port2 is 007E, CM0x7 CA0x3 Port3 is 007F.)
Header line	<ul style="list-style-type: none"> - Case of CA Port Date, CM0xX:CA0xX:PortX - Read IOPS, CM0xX:CA0xX:PortX - Write IOPS, CM0xX:CA0xX:PortX - Read Throughput, CM0xX:CA0xX:PortX - Write Throughput - Case of CM Port Date, CM0xX:PortX - Read IOPS, CM0xX:PortX - Write IOPS, CM0xX:PortX - Read Throughput, CM0xX:PortX - Write Throughput
Data line	<i>date</i> , <i>read</i> , <i>write</i> , <i>through-r</i> , <i>through-w</i> The following information is output for each field. <i>date</i> : Performance Information Acquisition Time (YYYY/MM/DD hh:mm:ss format) <i>read</i> : Read Count at <i>date</i> (Decimal notation. The unit is IOPS.) <i>write</i> : Write Count at <i>date</i> (Decimal notation. The unit is IOPS.) <i>through-r</i> : Read data transfer rate at <i>date</i> (Decimal notation. The unit is MB/S.) <i>through-w</i> : Write data transfer rate at <i>date</i> (Decimal notation. The unit is MB/S.)

Note: According to the port mode of the target CA/CM Port, the following is added at the end of each port name in the header line.

Port mode	FC	iSCSI
CA	-	(iSCSI-CA)
RA	(FC-RA)	(iSCSI-RA)

Port mode	FC	iSCSI
CA/RA	(FC-CA/RA)	(iSCSI-CA/RA)

The number of active disks performance information of storage device

Items	Explanation
File name	ACTIVE_DISK.csv
Header line	Date, Total Disks, Active Disks
Data line	<p><i>date,total,active</i></p> <p>The following information is output for each field.</p> <p><i>date</i> : Performance Information Acquisition Time (YYYY/MM/DD hh:mm:ss format)</p> <p><i>total</i> : Overall number of loaded disk devices at <i>date</i> (Decimal notation. The unit is Disk.)</p> <p><i>active</i> : Overall number of active disk devices at <i>date</i> (Decimal notation. The unit is Disk.)</p>

Power consumption performance information of storage device (ETERNUS DX60/DX60 S2/DX80/DX80 S2/DX90/DX90 S2, ETERNUS DX400 S2 series, ETERNUS DX8000 S2 series only)

Items	Explanation
File name	SYSTEM_POWER_CONSUMPTION.csv
Header line	Date, System Power Consumption
Data line	<p><i>date, power</i></p> <p>The following information is output for each field.</p> <p><i>date</i> : Performance Information Acquisition Time (YYYY/MM/DD hh:mm:ss format)</p> <p><i>power</i> : Power used by the device as a whole at <i>date</i> (Decimal notation. The unit is Watt.)</p>

Temperature performance information of storage device (ETERNUS DX60/DX60 S2/DX80/DX80 S2/DX90/DX90 S2, ETERNUS DX400 S2 series, ETERNUS DX8000 S2 series only)

Items	Explanation
File name	SYSTEM_TEMPERATURE.csv
Header line	Date, System Temperature
Data line	<p><i>date, temperature</i></p> <p>The following information is output for each field.</p> <p><i>date</i> : Performance Information Acquisition Time (YYYY/MM/DD hh:mm:ss format)</p> <p><i>temperature</i> : Air intake temperature at device at <i>date</i> (Decimal notation. The unit is degrees Centigrade.)</p>

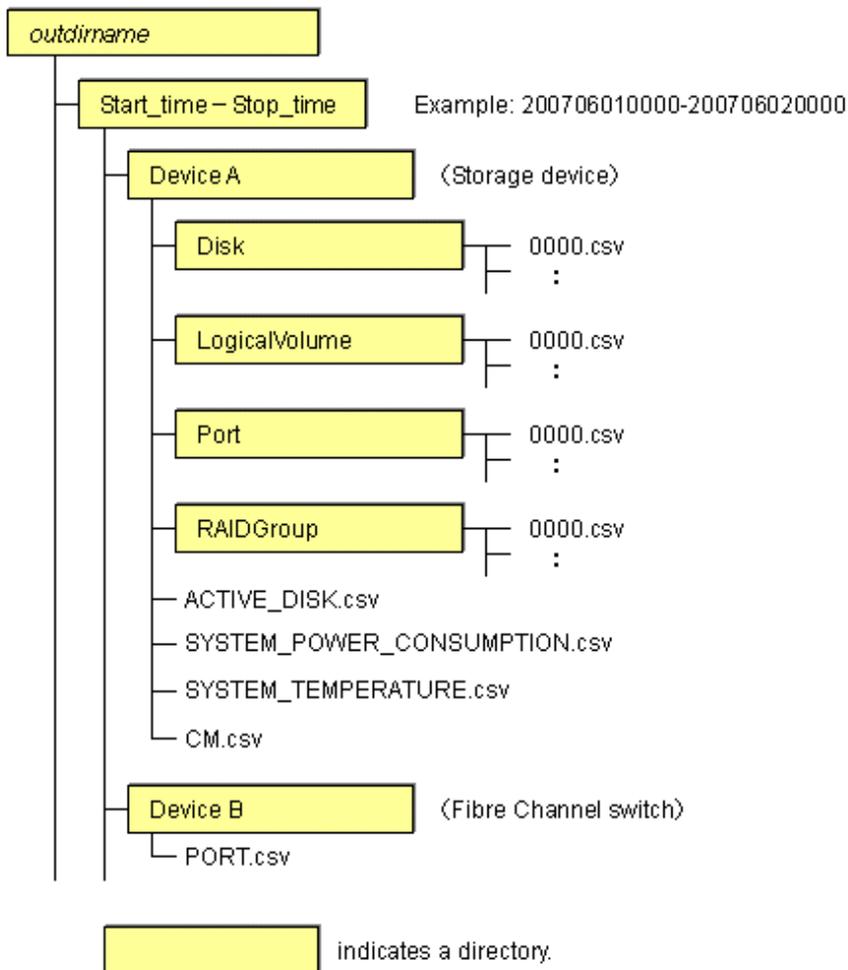
OPERANDS

export

Outputs performance information for the specified date in the CSV format.

outdirname

Specify the directory that outputs performance information. The full path of an existing directory must be specified in *outdirname*. Performance information is output to the *outdirname* directory based on the following configuration.



OPTIONS

-ipaddr *ipaddr*

Specify the IP address of the device that outputs performance information.

The output target device must satisfy the following conditions:

- The device is registered with this software, and it is one of the following performance monitoring targets:
 - ETERNUS DX series, ETERNUS2000, ETERNUS4000, ETERNUS8000
 - The Fibre Channel switches and Fibre Channel switch blades which support the performance monitoring.

Refer to "[7.2.2 Instruction for performance management](#)" for the settings of performance monitoring.

-date *start_time*[-*end_time*]

Specify the start and end times for the output of performance information in YYYYMMDDhhmm format. The start and end times must be concatenated using a hyphen ("-"), as follows:

```
YYYYMMDDhhmm-YYYYMMDDhhmm
```

If the hyphen ("-") and end time are omitted, the command execution time will be the end time.

The time that is specified for the -date option start time must be earlier than the end time. Additionally, the time that is specified for the start and end times must be later than 00:00 on 01/08/2001, and earlier than the command execution time.

If this option is omitted, a time 30 minutes before the command execution time will be the start time, and the command execution time will be the end time.

EXAMPLES

Windows environment

- Output of performance information from 00:00 on 01/01/2012 to 23:59 on 01/01/2012 for a device with IP address 10.101.12.13 to the c:\work directory:

```
> storageadm perfdata export "C:\work" -ipaddr 10.101.12.13 -date 201201010000-201201012359
```

- Output of performance information from 00:00 on 01/01/2012 to now for a device with IP address 10.101.12.13 to the c:\work directory:

```
> storageadm perfdata export "C:\work" -ipaddr 10.101.12.13 -date 201201010000
```

Solaris or Linux environment

- Output of performance information from 00:00 on 01/01/2012 to 23:59 on 01/01/2012 for a device with IP address 10.101.12.13 to the /tmp/work directory:

```
> storageadm perfdata export /tmp/work -ipaddr 10.101.12.13 -date 201201010000-201201012359
```

- Output of performance information from 00:00 on 01/01/2012 to now for a device with IP address 10.101.12.13 to the /tmp/work directory:

```
> storageadm perfdata export /tmp/work -ipaddr 10.101.12.13 -date 201201010000
```

11.1.1.7 storageadm spindle (Disk control command)

NAME

storageadm spindle - controls disks

SYNOPSIS

```
storageadm spindle start -ipaddr ipaddr {-raid RAIDgroup_number[,RAIDgroup_number,...] | -server} [-sync [-time timeout]]
```

```
storageadm spindle stop -ipaddr ipaddr {-raid RAIDgroup_number[,RAIDgroup_number,...] | -server} [-sync [-time timeout]] [-s] [-f]
```

```
storageadm spindle info -ipaddr ipaddr [{-raid RAIDgroup_number[,RAIDgroup_number,...] | -server}]
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\sbin\storageadm spindle
```

(\$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVssmgr/sbin/storageadm spindle
```

DESCRIPTION

Starts or stops the storage device RAID disk rotation.

In the Windows environment, only a user of the Administrators group can execute this command.

In the Solaris or Linux environment, only OS administrator (root) user can execute this command.

If a storage device was specified when the status was displayed, the rotation status of the disk that was used to configure RAID is displayed. If a server was specified, the storage device RAID group number and volume number used by the server are displayed.

By specifying the storage device IP address and RAID group number in the command operand, the rotation of the disk that was used to configure the storage device RAID is started or stopped.

By specifying the server IP address, the rotation of the storage device disk used by the server is started or stopped.

The target storage device and server must be devices managed by this software.

OPERANDS

start

Starts the disk that is used to configure the storage device RAID group.

stop

Stops the disk that is used to configure the storage device RAID group.

info

Displays the storage device RAID group Eco-mode information, or the storage device information used by the server.

OPTIONS

Options of the start operand

-ipaddr *ipaddr*

Specify the storage device or server IP address.

-raid *RAIDgroup_number*[,*RAIDgroup_number*,...]

Specify the start target RAID group number using hexadecimal notation.

If more than one RAID group number is specified, separate each number using a comma (",").

Specify this option when the storage device IP address has been specified in the -ipaddr option.

-server

The rotation of the storage device disk used by the specified server is started.

Specify this option when the server IP address has been specified in the -ipaddr option.

-sync

There is no return until processing is complete, or the time specified in the -time option has elapsed.

-time *timeout*

Specify the timeout value (unit: seconds) if the -sync option has been specified. Specify a number from 1 to 86400.

If this option is omitted, the timeout value will be 600 seconds.

Options of the stop operand

-ipaddr *ipaddr*

Specify the storage device or server IP address.

-raid *RAIDgroup_number*[,*RAIDgroup_number*,...]

Specify the stop target RAID group number using hexadecimal notation.

If more than one RAID group number is specified, separate each number using a comma (",").

Specify this option when the storage device IP address has been specified in the -ipaddr option.

-server

The rotation of the storage device disk used by the specified server is stopped.

Specify this option when the server IP address has been specified in the -ipaddr option.

-sync

There is no return until processing is complete, or the time specified in the -time option has elapsed.

-time *timeout*

Specify the timeout value (unit: seconds) if the `-sync` option has been specified. Specify a number from 1 to 86400. If this option is omitted, the timeout value will be 600 seconds.

-s

Processing continues without the output of a confirmation message.

-f

Related RAID group disks are forcibly stopped.

Options of the info operand

-ipaddr *ipaddr*

Specify the storage device or server IP address.

-raid *RAIDgroup_number*[,*RAIDgroup_number*,...]

Specify the status display target RAID group number using hexadecimal notation.

If more than one RAID group number is specified, separate each number using a comma (",").

Specify this option when the storage device IP address has been specified in the `-ipaddr` option.

If this option is omitted, the information for all RAID groups in the specified storage device is displayed.

-server

The storage device RAID group Eco-mode information and volume number used by the specified server are displayed.

Specify this option when the server IP address has been specified in the `-ipaddr` option.

EXAMPLES

- Starting the disk that is used to configure the RAID group by specifying the storage device IP address and RAID group number:

```
> storageadm spindle start -ipaddr 10.10.10.10 -raid 0x0000,0x0001
```

- Stopping the disk that is used to configure the RAID group by specifying the storage device IP address and RAID group number:

```
> storageadm spindle stop -ipaddr 10.10.10.10 -raid 0x0001
```

- Stopping the disk that is used by the server by specifying the server:

```
> storageadm spindle stop -ipaddr 10.10.10.20 -server
```

- Displaying the Eco-mode status of all RAID groups in a storage device:

```
> storageadm spindle info -ipaddr 10.10.10.10
<<< ECO Mode RAID Group Information >>>
RAIDGROUP_NUMBER(NAME)  MODE DISK_STATUS          CONTROL SCHEDULE
-----
0x0000(data1)           ON   Idle                     OFF    External
0x0001(data2)           ON   in the boot process      ON     01-NAME0001
0x0002                   OFF  Active                    -
0x0003                   -   Active                    -
-----
```

The explanation of the information displayed in each field is as follows.

Field title	Explanation
RAIDGROUP_NUMBER(NAME)	Displays the RAID group number by the hexadecimal number of four digits. When the name is set on the RAID group, its name is displayed by enclosing in ().
MODE	Displays the Eco-mode status that is set on the RAID group. - "ON": Eco-mode is enabled.

Field title	Explanation
	<ul style="list-style-type: none"> - "OFF": Eco-mode is disabled. - "-"(hyphen): Eco-mode cannot be set.
DISK_STATUS	Displays the status of disks that compose the RAID group. <ul style="list-style-type: none"> - "Active": Disks are active. - "Idle": Disks are inactive. - "In the boot process": Disks start in progress. - "In the stop process": Disks stop in progress.
CONTROL	Displays the disk control status set on the RAID group. <ul style="list-style-type: none"> - "ON": Disk starting is requested. - "OFF": Disk stopping is requested. - "-"(hyphen): Uncontrollable.
SCHEDULE	Displays the Eco-mode schedule set on RAID group by the following format. The schedule name of External is displayed as "External". number-name The "number" is displayed in decimal number, and "name" is displayed in eight characters or less.

- Displaying the storage device RAID group number and volume number that are used by the server:

```
> storageadm spindle info -ipaddr 10.10.10.20 -server
<<< ECO Mode RAID GROUP information for Server >>>
IP_ADDRESS      RAID   MODE  DISK_STATUS      CONTROL  STOP
-----
10.10.10.10     0x0000 ON    Idle              OFF
                  0x0001 ON    Active            ON      *
-----

<<< Disk use information on Server >>>
IP_ADDRESS      RAID   VOLUME
-----
10.10.10.10     0x0000 0x0000,0x0001,0x0002,0x0003,0x0004,0x0005,0x0006,0x0007,
                  0x0008,0x0009,0x000A,0x000B,0x000C,0x000D,0x000E,0x000F,
                  0x0001 0x0010,0x0011,0x0012,0x0013,0x0014,0x0015,0x0016,0x0017,
                  0x0018,0x0019,0x001A,0x001B,0x001C,0x001D,0x001E,0x001F
-----
```

The explanation of the information displayed in each field is as follows.

- <<< ECO Mode RAID GROUP information for Server >>> information

Field title	Explanation
IP_ADDRESS	Displays the IP address of the storage device connected with the specified server.
RAID	Displays the RAID group number by the hexadecimal number of four digits. The RAID group including the volume used from the specified server is displayed.
MODE	Displays the Eco-mode status that is set on the RAID group. <ul style="list-style-type: none"> - "ON": Eco-mode is enabled. - "OFF": Eco-mode is disabled. - "-"(hyphen): Eco-mode cannot be set.
DISK_STATUS	Displays the status of disks that compose the RAID group.

Field title	Explanation
	<ul style="list-style-type: none"> - "Active": Disks are active. - "Idle": Disks are inactive. - "In the boot process": Disks start in progress. - "In the stop process": Disks stop in progress.
CONTROL	Displays the disk control status set on the RAID group. <ul style="list-style-type: none"> - "ON": Disk starting is requested. - "OFF": Disk stopping is requested. - "-"(hyphen): Uncontrollable.
STOP	Although the stopping the disks used from the specified server is directed, when any disks in this RAID group are used from other server or this RAID group cannot be stopped because of any following states, displays "*". <ul style="list-style-type: none"> - The RAID group for which the system disk is included - The RAID group for which it is set in the NAS area - The RAID group for which the mainframe volumes, MVV volumes, or MVV Concatenation volumes are registered

- <<< Disk use information on Server >>> information

Field title	Explanation
IP_ADDRESS	Displays the IP address of the storage device connected with the specified server.
RAID	Displays the RAID group number by the hexadecimal number of four digits. The RAID group including the volume used from the specified server is displayed.
VOLUME	Displays the volume number by the hexadecimal number of four digits. The volumes used from the specified server are displayed.

NOTES

- Storage devices must be registered with this software in order to start or stop disk rotation, or to display the rotation status of the disk. However, rotation statuses of disks for the following devices which are not registered with this software (but registered) are displayed.
 - ETERNUS DX60/DX60 S2/DX80/DX90
 - ETERNUS DX400 series
 - ETERNUS DX8000 series
 - ETERNUS2000
 - ETERNUS4000
 - ETERNUS8000
- There are RAID groups that cannot do the Eco-mode operation. Refer to "[Uncontrollable RAID groups](#)" in "[1.2.4 Energy-saving operation for storage device](#)".
- The RAID group Eco-mode must be ON to operate the RAID group start/stop control. Refer to "[6.1.6 How to control the Eco-mode](#)" for details on the procedure for setting the RAID group Eco-mode to ON.
- If disk rotation is started and stopped by specifying the server IP address, do not change the storage device connection.

- For the following cases, the disk rotation cannot be stopped by specifying the server IP address:
 - If one or more share disks are contained on the stopped disks.
Check the status of all servers that use their share disks, and judge whether share disks can be stopped or not. If share disks can be stopped, specify the -f option.
 - If the disks used from other server are included in the RAID group that stop target disk exists.
To stop the disk rotation, either specify server IP address for all servers that use the disk of its RAID group, or specify the -f option. When you specify -f option, check the status of all related servers, and judge whether disks can be stopped or not. It is recommended that the server and the RAID group be the compositions of couple 1.
 - If the RAID group including unused disks.
Re-execute either specify the -f option or specify the RAID group.
 - If the RAID group including the stop target disk is any of "Uncontrollable RAID groups".
- If the volume that belongs to the specified stop target RAID group is concatenated with a different RAID group using the LUN concatenation functionality, the disk is not stopped even if the "stop" operand is specified. To stop all related RAID group disks, either specify all of the related RAID groups, or specify the -f option. However, if the related RAID group is any of "Uncontrollable RAID groups", the disk control cannot be executed.
- The message below is output when the "stop" operand is specified. To continue, enter "y". To cancel, enter "n". This message is not output when the -s option is specified.

```
Are you sure? [y/n]:
```

- The information of storage device that can control disks is displayed on the storage device information used by the server. The information of storage device that cannot control disks is not displayed. When both the disk controllable storage device and the disk uncontrollable storage device are connected with the server, the information of disk controllable storage device is only displayed.
- The disk does not stop when the RAID group status is as follows:
 - Part of the storage device controller module and the module for the disk drive access route contain a fault.
 - The disk drive that was used to configure the RAID group is faulty.
 - There is a copy data of Advanced Copy.
 - There is an EC/REC session (including when there is no copy data. However, the disk will stop when the EC/REC status is Suspend.
 - There is a QuickOPC/SnapOPC session (including when there is no copy data).

11.1.1.8 storageadm remcs (REMCS notification command)

NAME

storageadm remcs - REMCS notification (Windows environment only)

SYNOPSIS

```
storageadm remcs send -ipaddr ipaddr -type type
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\sbin\storageadm remcs
```

(\$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.)

DESCRIPTION

This command is used to send REMCS notification of Fibre Channel switch which is registered with this software.

OPERANDS

send

As for REMCS notification of the Fibre Channel switch whose IP address is specified, sends a test mail.

OPTIONS

Options that can be specified when the send operand is specified

-ipaddr *ipaddr*

Specify the IP address of Fibre Channel switch.

-type *type*

Specify the type of the sending mail.

Make sure to specify "test".

EXAMPLES

- Send a test mail.

```
> storageadm remcs send -ipaddr 10.10.10.10 -type test
```

NOTES

- The Fibre Channel switch to be specified must be registered with this software.
- The settings for REMCS notification must be done in advance.

11.1.1.9 esfsnap (Troubleshooting information collection of Manager)

NAME

esfsnap - Collects the troubleshooting information of Manager

SYNOPSIS

```
esfsnap -dir dir rname [-all]
```

COMMAND PATH

Windows environment

```
$INS_DIR\Common\bin\esfsnap
```

(\$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVesfcm/bin/esfsnap
```

DESCRIPTION

Collect information of the Manager on the Management Server.
Only OS administrator user can execute this command.

The `esfsnap` is the command used to collect information on the Management Server when a problem occurs. Submit the information to Fujitsu technical staff.

OPTIONS

`-dir dirname`

Specify the directory that stores the troubleshooting information for *dirname*.

In the Windows environment, specify the full path name that starts from the drive letter for *dirname*. The maximum length that can be specified for *dirname* is 70 bytes.

In the Solaris or Linux environment, specify the full path name for *dirname*.

In the Windows environment, the collected information is stored in the directory that its name starts with "esfsnap_". In the Solaris or Linux environment, the collected information is gathered in the file that its name starts by "esfsnap_". Before executing this command, confirm that *dirname* directory has the following free space.

Collected information	Required free space
Initial investigation information	more than 40MB
All troubleshooting information	more than "80 + (2 * Number_of_registered_devices)" MB

`-all`

Collects all troubleshooting information on servers. Data includes lots of information, which will increase the size of the data. This option is not necessary for initial investigation.

EXAMPLES

Windows environment

- Collecting the troubleshooting information for initial investigation on D:\temp directory.

```
> esfsnap -dir D:\temp
```

Solaris or Linux environment

- Collecting the troubleshooting information for initial investigation on /tmp directory.

```
> esfsnap -dir /tmp
```

11.1.2 Commands for storage management

The following sub sections explain the commands for managing the storage device.

In the Windows environment, only a user of the Administrators group can execute this command.

In the Solaris or Linux environment, only OS administrator (root) user can execute this command.

The following table shows the relationship between commands and the storage devices where they can be used. The storage device must be registered with this software.

Command name	ETERNUS DX80 S2 ETERNUS DX90 S2 ETERNUS DX400 S2 series ETERNUS DX8000 S2 series	ETERNUS DX60/DX60 S2 ETERNUS DX80 ETERNUS DX90 ETERNUS DX400 series ETERNUS DX8000 series ETERNUS2000 ETERNUS4000 ETERNUS8000
storageadm disk	Available	Available (*1)
storageadm raid	Available	Available (*1)
storageadm volume	Available	Available (*1)
storageadm affinity	Available	Available (*1)
storageadm ecomode	Available	Available (*1)
storageadm port	Available	Available (*1)
storageadm iscsiport	Available	Available (*1 and *2)
storageadm progress	Available	Available (*1)

*1: Its information can be displayed even if the device is not registered with this software (but detected).

*2: For ETERNUS DX60/DX60 S2/DX80, only iSCSI model device is supported. The "ETERNUS4000" indicates ETERNUS4000 models 400 and 600. The "ETERNUS8000" indicates ETERNUS8000 models 800, 1200 and 2200.

11.1.2.1 storageadm disk (Disk management command)

NAME

storageadm disk - Manages disks

SYNOPSIS

```
storageadm disk info -ipaddr ipaddr [-csv]
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\sbin\storageadm disk
```

(\$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVssmgr/sbin/storageadm disk
```

DESCRIPTION

This command displays information of disks in the ETERNUS Disk storage system that is registered with this software.

OPERANDS

info

Displays detail information of disks in the ETERNUS Disk storage system that is registered with this software.

OPTIONS

Options of the info operand

`-ipaddr ipaddr`

Specify the IP address of the storage device.

`-csv`

Displays the disk information in the CSV format.

If this option is omitted, it is displayed in the table format.

EXAMPLES

- Displaying the disk information in the table format.

```
> storageadm disk info -ipaddr 192.168.0.1
<<< Disk Information >>>
NUMBER DE   SLOT USAGE           STATUS   RGNO   SIZE  DISKTYPE MOTOR
-----
0      0x00 0    System Disk   Available 0x0002 300GB SAS   Active
1      0x00 1    System Disk   Available 0x0001 300GB SAS   Idle
2      0x00 2    System Disk   Available 0x0002 300GB SAS   In the boot process
3      0x00 3    System Disk   Available 0x0003 300GB SAS   In the stop process
4      0x00 4    Data Disk     Available 0x0003 300GB SAS   Active
-----
INFO:swsag0001:Command terminated normally.
```

- Displaying the disk information in the CSV format.

```
> storageadm disk info -ipaddr 192.168.0.1 -csv
NUMBER,DE,SLOT,USAGE,STATUS,RGNO,SIZE,DISKTYPE,MOTOR
0,0x00,0,System Disk,Available,0x0002,300GB,SAS,Active
1,0x00,1,System Disk,Available,0x0001,300GB,SAS,Idle
2,0x00,2,System Disk,Available,0x0002,300GB,SAS,In the boot process
3,0x00,3,System Disk,Available,0x0003,300GB,SAS,In the stop process
4,0x00,4,Data Disk,Available,0x0003,300GB,SAS,Active
```

11.1.2.2 storageadm raid (RAID management command)

NAME

`storageadm raid` - Manages RAID groups

SYNOPSIS

```
storageadm raid add -ipaddr ipaddr -disk
DE_number:slot_number,DE_number:slot_number[,DE_number:slot_number,...] -level RAIDlevel [-name
alias_name] [-cm assigned_CM] [-csv]

storageadm raid delete -ipaddr ipaddr -raidgroup RAIDgroup_number [-f] [-s]

storageadm raid info -ipaddr ipaddr [-raidgroup RAIDgroup_number] [-remote BOX-ID] [-csv]

storageadm raid ecomode -ipaddr ipaddr -raidgroup RAIDgroup_number [RAIDgroup_number,...] -on|-off [-s]
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\sbin\storageadm raid
```

(\$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVssmgr/sbin/storageadm raid
```

DESCRIPTION

This command is used to create/delete/display and sets the Eco-mode for a RAID group in the ETERNUS Disk storage system that is registered with this software.

OPERANDS

add

Creates a RAID group

delete

Deletes a RAID group

info

Displays a RAID group information

ecomode

Sets the Eco-mode for the RAID group

OPTIONS

Options of the add operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-disk *DE_number.slot_number,DE_number.slot_number[,DE_number.slot_number,...]*

Specify DE numbers and slot numbers for the storage device using either decimal or hexadecimal notation, placing a colon (":") in the middle of each DE number and slot number pair, and using commas (",") to separate pairs. For example, two pairs can be specified as "-disk 1:1,1:2" in decimal notation or "-disk 0x1:0x1,0x1:0x2" in hexadecimal notation.

Be sure to specify at least two DE number/slot number pairs.

-level *RAIDlevel*

Specify the RAID level by the minuscule as follows.

Characters that can be specified	Created RAID level
raid0	RAID0
raid1	RAID1
raid1+0	RAID1+0
raid5	RAID5
raid5+0	RAID5+0
raid6	RAID6

-name *alias_name*

Specify an alias for the RAID group to be created.

Only alphanumeric characters (a to z, A to Z and 0 to 9) and the following symbols can be used for aliases: !@#%&*()-= ` _ + | ~ [] { } ; : " ' / < > ?. However, "?" is not supported for ETERNUS DX80 S2/DX90 S2, ETERNUS DX400 S2 series, and ETERNUS DX8000 S2 series. If the alias contains a space, enclose the entire alias in double quotes (e.g., -name "123 567").

This option cannot be specified to ETERNUS4000 and ETERNUS8000 since these devices do not support an alias name. If you specify this option to them, this command terminates with an error.

If this option is omitted, the specification is as follows:

Storage device	Specification when this option is omitted
ETERNUS DX60/DX60 S2 ETERNUS DX80/DX80 S2 ETERNUS DX90/DX90 S2 ETERNUS DX400 S2 series ETERNUS DX8000 S2 series	An alias name is set automatically.
ETERNUS DX400 series ETERNUS DX8000 series ETERNUS2000	An alias name is not set.

-cm *assigned_CM*

Specify the assigned CM number for the RAID group using two digits, as in the following table. If this option is omitted, the assigned CM number will be set up automatically ("auto" will be specified).

Storage device	Assigned CM	Characters to be specified	Remarks
ETERNUS DX60/DX60 S2 ETERNUS DX80/DX80 S2 ETERNUS DX90/DX90 S2 ETERNUS2000	CM#0	00	For the first digit, enter the assigned CM number. For the second character, always enter "0".
	CM#1	10	
ETERNUS DX400 series ETERNUS DX400 S2 series ETERNUS DX8000 series ETERNUS DX8000 S2 series ETERNUS4000 ETERNUS8000	CM#0 CPU#0	00	For the first digit, enter the assigned CM number. For the second digit, enter the number of the CPU within the CM entered for the first digit.
	CM#0 CPU#1	01	
	CM#1 CPU#0	10	
	CM#1 CPU#1	11	
	:	:	
	CM#7 CPU#0	70	
	CM#7 CPU#1	71	

-csv

Displays the RAID group number in the CSV format.

If this option is omitted, it is displayed in the table format.

Options of the delete operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-raidgroup *RAIDgroup_number*

Specify the RAID group number to be deleted, using either decimal or hexadecimal notation. For example, RAID group number 16 can be specified as "-raidgroup 16" in decimal notation or "-raidgroup 0x10" in hexadecimal notation.

-s

Processing continues without the output of a confirmation message.

-f

If there are volumes within the RAID group, the volumes will be deleted before the RAID group is deleted. However, the command will terminate with an error without deleting the volumes if any of the following conditions apply to the RAID group:

- The volumes in the RAID group have been mapped
- There are volumes other than open volumes
- There are LUN concatenated volumes
- There are ODX Buffer Volumes

Options of the info operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-raidgroup *RAIDgroup_number*

Specify the RAID group number for which detailed information is to be displayed, using either decimal or hexadecimal notation. For example, RAID group number 16 can be specified as "-raidgroup 16" in decimal notation or "-raidgroup 0x10" in hexadecimal notation.

-remote *BOX-ID*

Specify a Box ID for the remote site ETERNUS Disk storage system. Specify it when you display the RAID group information of the remote site ETERNUS Disk storage system.

-csv

Displays the RAID group information in the CSV format.
If this option is omitted, it is displayed in the table format.

Options of the ecomode operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-raidgroup *RAIDgroup_number[,RAIDgroup_number,...]*

Specify the RAID group number for which detailed information is to be displayed, using decimal and/or hexadecimal notations. For example, RAID group number 16 can be specified as "-raidgroup 16" in decimal notation or "-raidgroup 0x10" in hexadecimal notation.

The more than one RAID group number can be specified.

-on

Set the Eco-mode to ON for the specified RAID group.
This option cannot be specified at the same time as the -off option.
This option cannot be set if the Eco-mode cannot be set for any one of the specified RAID groups.

-off

Set the Eco-mode to OFF for the specified RAID group.
This option cannot be specified at the same time as the -on option.

-s

Continues processing without asking for confirmation.

EXAMPLES

- Creating a RAID group and displaying the created RAID group in the table format.

```
# /opt/FJSVssmgr/sbin/storageadm raid add -ipaddr 1.2.3.4 -disk 1:10,1:11,1:12,1:13,1:14,1:15 -  
level raid5  
<<< RAID ADD >>>  
RGNO
```

```
-----  
0x0000  
-----
```

```
INFO:swsag0001:Command terminated normally.
```

- Creating a RAID group and displaying the created RAID group in the CSV format.

```
# /opt/FJSVssmgr/sbin/storageadm raid add -ipaddr 1.2.3.4 -disk 1:10,1:11,1:12,1:13,1:14,1:15 -  
level raid5 -csv  
RGNO  
0x0000
```

- Deleting a RAID group.

```
# /opt/FJSVssmgr/sbin/storageadm raid delete -ipaddr 1.2.3.4 -raidgroup 16  
Are you sure? [y/n]:y  
INFO:swsag0001:Command terminated normally.
```

- Displaying the RAID group information in the table format.

```
# /opt/FJSVssmgr/sbin/storageadm raid info -ipaddr 1.2.3.4  
<<< RAID Information >>>  
RGNO  NAME  USAGE      LEVEL  STATUS  CM      TOTAL_CAPACITY  FREE_CAPACITY  
-----  
0x0000  Open, System RAID5  Available  CM0CPU0  407775  0  
0x0001  Open, SDV   RAID5  Available  CM1CPU0  410880  285440  
0x0002  Open      RAID1  Available  CM0CPU1  136960  345367  
-----  
INFO:swsag0001:Command terminated normally.
```

- Displaying the RAID group information in the CSV format.

```
# /opt/FJSVssmgr/sbin/storageadm raid info -ipaddr 1.2.3.4 -csv  
RGNO,NAME,USAGE,LEVEL,STATUS,CM,TOTAL_CAPACITY,FREE_CAPACITY  
0x0000,, "Open, System", RAID5, Available, CM0CPU0, 407775, 0  
0x0001,, "Open, SDV", RAID5, Available, CM1CPU0, 410880, 285440  
0x0002,, "Open, RAID1", Available, CM0CPU1, 136960, 345367
```

- Displaying the RAID group detail information in the table format.

```
# /opt/FJSVssmgr/sbin/storageadm raid info -ipaddr 1.2.3.4 -raidgroup 0x0000  
<<< RAID Information >>>  
RGNO  NAME  USAGE      LEVEL  STATUS  CM      TOTAL_CAPACITY  FREE_CAPACITY  
-----  
0x0000  Open, System RAID5  Available  CM0CPU0  407775  0  
  
NO      CONCATENATION  NAME      TOTAL_CAPACITY  ALLOCATED  STATUS  TYPE  
-----  
0x0001  1/3            sample    102400          102400     Available  Open  
0x0001  2/3            sample    1024            1024       Available  Open  
Free    -              -         2048            2048       -         -  
0x0004  -              -         1536            1536       Available  Open  
-----  
INFO:swsag0001:Command terminated normally.
```

- Displaying the RAID group detail information in the CSV format.

```
# /opt/FJSVssmgr/sbin/storageadm raid info -ipaddr 1.2.3.4 -raidgroup 0x0000 -csv  
RGNO,NAME,USAGE,LEVEL,STATUS,CM,TOTAL_CAPACITY,FREE_CAPACITY,NO,CONCATENATION,NAME,TOTAL_CAPACITY  
,ALLOCATED_CAPACITY,STATUS,TYPE  
0x0000,"Open, System", RAID5, Available, CM0CPU0, 407775, 0, 0x0001, 1/3, sample,  
102400, 102400, Available, Open  
0x0000,"Open, System", RAID5, Available, CM0CPU0, 407775, 0, 0x0001, 2/3, sample, 1024, 1024, Available, Open
```

```
0x0000,"Open,System",RAID5,Available,CM0CPU0,407775,0,Free,-,,2048,2048,,
0x0000,"Open,System",RAID5,Available,CM0CPU0,407775,0,0x0004,-,,1536,1536,Available,Open
```

- RAID group Eco-mode set to ON.

```
# /opt/FJSVssmgr/sbin/storageadm raid ecomode -ipaddr 1.2.3.4 -raidgroup 0x0000 -on
Are you sure? [y/n]:y
INFO:swsag0001:Command terminated normally.
```

- RAID group Eco-mode set to OFF.

```
# /opt/FJSVssmgr/sbin/storageadm raid ecomode -ipaddr 1.2.3.4 -raidgroup 0x0000 -off
Are you sure? [y/n]:y
INFO:swsag0001:Command terminated normally.
```

NOTES

- The message below will be output if the `-s` option is not specified with the "delete" operand. Enter "y" to continue or "n" to cancel. This message can be suppressed by specifying the `-s` option.

```
Are you sure? [y/n]:
```

- Setting the Eco-mode for a RAID group with an Eco-mode schedule already set results in the following:
 - RAID group Eco-mode set to ON -> Eco-mode ON overwrites the RAID group eco-mode schedule.
 - RAID group Eco-mode set to OFF -> An error occurs (unless the Eco-mode schedule is software-controlled).
- If the Eco-mode operation is not possible for the specified RAID group, then the command terminates with an error. Refer to "[Uncontrollable RAID groups](#)" in "[1.2.4 Energy-saving operation for storage device](#)" for details of RAID groups for which the Eco-mode operation is not possible.
- You can use the `-remote` option only when using the Dynamic LUN Mirroring function of ServerView Resource Orchestrator.
- Temporary volumes are displayed as unknown volumes.
- You cannot create a new volume from RAID group with temporary volumes.
- ODX Buffer Volumes are not displayed.

11.1.2.3 storageadm volume (Volume management command)

NAME

storageadm volume - Manages volumes

SYNOPSIS

```
storageadm volume add -ipaddr ipaddr -size capacity -raidgroup RAIDgroup_number [-name alias_name] [-csv]
```

```
storageadm volume delete -ipaddr ipaddr [-volume volume_number[,volume_number,...]] [-remote BOX-ID -remote-volume volume_number [-remote-force]] [-s]
```

```
storageadm volume format -ipaddr ipaddr -volume volume_number[,volume_number,...]] [-s]
```

```
storageadm volume info -ipaddr ipaddr [-volume volume_number,...]] [-remote BOX-ID] [-csv]
```

```
storageadm volume nomapping -ipaddr ipaddr [-volume volume_number,...]] [-remote BOX-ID] [-csv]
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\sbin\storageadm volume
```

(\$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVssmgr/sbin/storageadm volume
```

DESCRIPTION

This command is used to create/delete/format/display volumes in the ETERNUS Disk storage system that is registered with this software.

OPERANDS

add

Creates a volume.

delete

Deletes volumes.

format

Formats volumes.

info

Displays volume information.

nomapping

Displays the information of volumes that are not mapped to affinity group.

OPTIONS

Options of the add operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-size *capacity*

Specify the size of the volume to be created in MB or GB. 1 GB is equivalent to 1024 MB. For example, 1024 MB is specified as "-size 1024MB" or "-size 1GB".

-raidgroup *RAIDgroup_number*

Specify the RAID group number for which a volume is to be created, using either decimal or hexadecimal notation. For example, RAID group number 16 can be specified as "-raidgroup 16" in decimal notation or "-raidgroup 0x10" in hexadecimal notation.

-name *alias_name*

Specify an alias for the volume to be created.

Only alphanumeric characters (a to z, A to Z and 0 to 9) and the following symbols can be used for aliases: !@#\$%^&*()-= ` _ + | ~[]{};:~"/<>?. However, "?" is not supported for ETERNUS DX80 S2/DX90 S2, ETERNUS DX400 S2 series and ETERNUS DX8000 S2 series. If the alias contains a space, enclose the entire alias in double quotes (e.g., -name "123 567").

This option cannot be specified to ETERNUS4000 and ETERNUS8000 since these devices do not support an alias name. If you specify this option to them, this command terminates with an error.

If this option is omitted, the specification is as follows:

Storage device	Specification when this option is omitted
ETERNUS DX60/DX60 S2 ETERNUS DX80/DX80 S2 ETERNUS DX90/DX90 S2 ETERNUS DX400 S2 series ETERNUS DX8000 S2 series	An alias name is set automatically.
ETERNUS DX400 series ETERNUS DX8000 series ETERNUS2000	An alias name is not set.

-csv

Displays the created volume number in the CSV format.
if this option is omitted, it is displayed in the table format.

Options of the delete operand or format operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-volume *volume_number*[,*volume_number*,...]

Specify the numbers for the volumes to be deleted or formatted, using either decimal or hexadecimal notation.
If multiple volume numbers are specified, use commas (",") to separate volume numbers. For example, specify volumes 10 and 16 as either "-volume 10,16" in decimal notation or "-volume 0xa,0x10" in hexadecimal notation.

-remote *BOX-ID*

Specify a Box ID for the remote site ETERNUS Disk storage system. Specify it when you display the RAID group information of the remote site ETERNUS Disk storage system.

-remote-volume *volume_number*

Specify the number for the volume to be deleted from the remote site ETERNUS Disk storage system using either a decimal or hexadecimal number. Multiple volume numbers cannot be specified. If multiple volume numbers are specified, only the first one will be used.

Volumes which may be currently used cannot be deleted.

-remote-force

Specify this option to forcibly delete volumes, which may be currently used, from the remote site ETERNUS Disk storage system.

-s

Processing continues without the output of a confirmation message.

Options of the info operand or nomapping operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-volume *volume_number*[,*volume_number*,...]

Specify the numbers for the volumes to be output for which information is to be output, using either decimal or hexadecimal notation.
If multiple volume numbers are specified, use commas (",") to separate volume numbers. For example, specify volumes 10 and 16 as either "-volume 10,16" in decimal notation or "-volume 0xa,0x10" in hexadecimal notation.

If this option is omitted, information will be displayed for all target volumes.

-remote *BOX-ID*

Specify a Box ID for the remote site ETERNUS Disk storage system. Specify it when you display the RAID group information of the remote site ETERNUS Disk storage system.

-csv

Displays the volume information in the CSV format.
If this option is omitted, it is displayed in the table format.

EXAMPLES

- Creating a volume and displaying the created volume in the table format.

```
> storageadm volume add -ipaddr 1.2.3.4 -size 1024MB -raidgroup 16
<<< Volume ADD >>>
NUMBER
-----
0x0001
-----
INFO:swsag0001:Command terminated normally.
```

- Creating a volume and displaying the created volume in the CSV format.

```
> storageadm volume add -ipaddr 1.2.3.4 -size 1024MB -raidgroup 16 -csv
NUMBER
0x0001
```

- Deleting a volume.

```
> storageadm volume delete -ipaddr 1.2.3.4 -volume 16
Are you sure? [y/n]: y
INFO:swsag0001:Command terminated normally.
```

- Formatting a volume.

```
> storageadm volume format -ipaddr 1.2.3.4 -volume 16
Are you sure? [y/n]: y
INFO:swsag0001:Command terminated normally.
```

- Displaying the volume information in the table format.

```
> storageadm volume info -ipaddr 1.2.3.4
<<< Volume Information >>>
NUMBER  NAME      TOTAL_CAPACITY STATUS    TYPE      CONCATENATION  RGNO  ENCRYPT
-----  -
Unknown  0          Available F6427G -      0x0001 -
0x0001  100        Available SDV -      0x0000 -
0x0002  425        Available Open -     0x0002 -
Unknown  1166       Available MVV(G) -    0x0001 -
Unknown  2332       Available MVV(G) 2    0x0001 -
0x0005  150        Available Open -     0x0002 -
0x0006  4700       Available Open 3      0x0000,0x0002 -
-----
INFO:swsag0001:Command terminated normally.
```

- Displaying the volume information in the CSV format.

```
> storageadm volume info -ipaddr 1.2.3.4 -csv
NUMBER,NAME,TOTAL_CAPACITY,STATUS,TYPE,CONCATENATION,RGNO,ENCRYPT
Unknown,,0,Available,F6427G,-,0x0001,-
0x0001,,100,Available,SDV,-,0x0000,-
0x0002,,425,Available,Open,-,0x0002,-
Unknown,,1166,Available,MVV(G),-,0x0001,-
Unknown,,2332,Available,MVV(G),2,0x0001,-
0x0005,,150,Available,Open,-,0x0002,-
0x0006,,4700,Available,Open,3,"0x0000,0x0002",-
```

- Displaying the unused volume information in the table format.

```
> storageadm volume nomapping -ipaddr 1.2.3.4
<<< Volume Information >>>
NUMBER  NAME      TOTAL_CAPACITY STATUS    TYPE      CONCATENATION  RGNO  ENCRYPT
-----  -
```

```

Unknown          0          Available F6427G -          0x0001 -
0x0001          100          Available SDV -          0x0000 -
0x0002          425          Available Open -          0x0002 -
Unknown          1166          Available MVV(G) -          0x0001 -
Unknown          2332          Available MVV(G) 2 -          0x0001 -
0x0005          150          Available Open -          0x0002 -
0x0006          4700          Available Open 3          0x0000,0x0002 -

```

INFO:swsag0001:Command terminated normally.

- Displaying the unused volume information in the CSV format.

```

> storageadm volume nomapping -ipaddr 1.2.3.4 -csv
NUMBER,NAME,TOTAL_CAPACITY,STATUS,TYPE,CONCATENATION,RGNO,ENCRYPT
Unknown,,0,Available,F6427G,-,0x0001,-
0x0001,,100,Available,SDV,-,0x0000,-
0x0002,,425,Available,Open,-,0x0002,-
Unknown,,1166,Available,MVV(G),-,0x0001,-
Unknown,,2332,Available,MVV(G),2,0x0001,-
0x0005,,150,Available,Open,-,0x0002,-
0x0006,,4700,Available,Open,3,"0x0000,0x0002",-

```

NOTES

- Only open volumes can be created.
- The volumes that are created are formatted automatically.
- The message below will be output if the -s option is not specified when either the "delete" operand or the "format" operand is specified.
Enter "y" to continue or "n" to cancel.
This message can be suppressed by specifying the -s option.

```
Are you sure? [y/n]:
```

- Volumes cannot be deleted by specifying the volume numbers for volumes that are not open volumes.
- Volumes cannot be deleted by specifying the volume numbers for LUN concatenated volumes.
- Volumes that have been mapped to an affinity group cannot be deleted.
- The Thin Provisioning Volume is not able to create. However, it possible to remove.
- You can use the -remote, the -remote-volume and the -remote-force options only when using the Dynamic LUN Mirroring function of ServerView Resource Orchestrator.
- Temporary volumes are displayed as unknown volumes.
- You cannot create a new volume from RAID group with temporary volumes.
- You cannot delete temporary volumes.
- You cannot create, delete, or format Wide Striping Volumes.
- You cannot create, delete, format, or display ODX Buffer Volumes.

11.1.2.4 storageadm affinity (AffinityGroup management command)

NAME

storageadm affinity - Manages affinity groups

SYNOPSIS

```
storageadm affinity add -ipaddr ipaddr -volume volume_number[,volume_number,...] [-lun LUN_number] [-affinitygroup affinitygroup_number] [-name alias_name] [-csv]
```

```
storageadm affinity delete -ipaddr ipaddr -affinitygroup affinitygroup_number [-s]
```

```
storageadm affinity update -ipaddr ipaddr -affinitygroup affinitygroup_number {-add -volume volume_number[,volume_number,...] [-lun LUN_number[,LUN_number,...]] | -delete [-volume volume_number[,volume_number,...] | -lun LUN_number[,LUN_number,...]]} [-s]
```

```
storageadm affinity info -ipaddr ipaddr [-affinitygroup affinitygroup_number] [-csv]
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\sbin\storageadm affinity
```

(*\$INS_DIR* means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVssmgr/sbin/storageadm affinity
```

DESCRIPTION

This command is used to create/delete/modify/display affinity groups in the ETERNUS Disk storage system that is registered with this software.

OPERANDS

add

Creates an affinity group.

delete

Deletes an affinity group.

update

Updates the configuration of an affinity group.

info

Displays the affinity group information.

OPTIONS

Options of the add operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-volume *volume_number*[,*volume_number*,...]

Specify the numbers of the volumes to be set to an affinity group, using either decimal or hexadecimal notation.

If multiple volume numbers are specified, use commas (",") to separate volume numbers. For example, specify volumes 16, 17 and 18 as either "-volume 16,17,18" in decimal notation or "-volume 0x10,0x11,0x12" in hexadecimal notation.

-lun *LUN_number*,...

Specify the LUN number to be allocated to the volume, using either decimal or hexadecimal notation. The number of LUN numbers specified must be the same as the number of volumes specified using the **-volume** option, and the LUN numbers must also be listed

in the same order as their corresponding volume numbers.

If multiple LUN numbers are specified, use commas (",") to separate LUN numbers. For example, specify LUN numbers 16, 17 and 18 as either "-lun 16,17,18" in decimal notation or "-lun 0x10,0x11,0x12" in hexadecimal notation.

If this option is omitted, LUN numbers will be allocated in order, starting from 0.

-affinitygroup *affinitygroup_number*

Specify the affinity group number to be created, using either decimal or hexadecimal notation. For example, specify affinity group number 16 as either "-affinitygroup 16" in decimal or "-affinitygroup 0x10" in hexadecimal.

If this option is omitted, the affinity group numbers that can be created within the target storage device will be allocated automatically.

-name *alias_name*

Specify an alias for the AffinityGroup to be created.

Only alphanumeric characters (a to z, A to Z and 0 to 9) and the following symbols can be used for aliases: !@#%&^&*()-= ` _ + | ~ [] { } ; : " ' / < > ?. However, "?" is not supported for ETERNUS DX80 S2/DX90 S2, ETERNUS DX400 S2 series and ETERNUS DX8000 S2 series. If the alias contains a space, enclose the entire alias in double quotes (e.g., -name "123 567").

This option must be specified for ETERNUS DX60/DX60 S2/DX80/DX90 and ETERNUS2000.

This option can be omitted for ETERNUS DX80 S2/DX90 S2, ETERNUS DX400/DX400 S2 series, ETERNUS DX8000/DX8000 S2 series, ETERNUS4000, and ETERNUS8000.

If this option is omitted for ETERNUS DX400 series, ETERNUS DX8000 series, ETERNUS4000, and ETERNUS8000, alias names are not set.

If this option is omitted for ETERNUS DX80 S2/DX90 S2, ETERNUS DX400 S2 series, and ETERNUS DX8000 S2 series, alias names are set automatically.

-csv

Displays the created affinity group number in the CSV format.

If this option is omitted, it is displayed in the table format.

Options of the delete operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-affinitygroup *affinitygroup_number*

Specify the number of the affinity group to be deleted, using either decimal or hexadecimal notation. For example, specify affinity group number 16 as either "-affinitygroup 16" in decimal or "-affinitygroup 0x10" in hexadecimal.

-s

Processing continues without the output of a confirmation message.

Options of the update operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-affinitygroup *affinitygroup_number*

Specify the number of the affinity group whose configuration is to be changed, using either decimal or hexadecimal notation. For example, specify affinity group number 16 as either "-affinitygroup 16" in decimal or "-affinitygroup 0x10" in hexadecimal.

-add

Adds volumes in the affinity group.

When the number for the allocated volume/LUN is specified, this command terminates abnormally.

-delete

Deletes volumes from an affinity group.

The command will terminate abnormally if a volume number or LUN number of a volume that has not been mapped is specified, or if deleting the specified mapping will mean that there are no more mappings.

-volume *volume_number[,volume_number,...]*

Specify the volume number of the volume to be added to or deleted from an affinity group, using either decimal or hexadecimal notation.

If multiple volume numbers are specified, use commas (",") to separate volume numbers. For example, specify volumes 16, 17 and 18 as either "-volume 16,17,18" in decimal notation or "-volume 0x10,0x11,0x12" in hexadecimal notation.

This option cannot be specified together with the -lun option when deleting volumes from an affinity group. Delete volumes by specifying either this option or the -lun option, not both together.

-lun *LUN_number[,LUN_number,...]*

Specify the LUN number to be allocated to a volume or released from a volume, using either decimal or hexadecimal notation. The number of LUN numbers specified must be the same as the number of volumes specified using the -volume option, and the LUN numbers must also be listed in the same order as their corresponding volume numbers.

If multiple LUN numbers are specified, use commas (",") to separate LUN numbers. For example, specify LUN numbers 16, 17 and 18 as either "-lun 16,17,18" in decimal notation or "-lun 0x10,0x11,0x12" in hexadecimal notation.

If this option is omitted when LUN numbers are being allocated, LUN numbers will be automatically allocated, starting with the smallest free LUN number.

When LUN numbers are being released from volumes, this option cannot be specified together with the -volume option. Release LUN numbers by specifying either this option or the -volume option, but not both together.

-s

Processing continues without the output of a confirmation message.

Options of the info operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-affinitygroup *affinitygroup_number*

Specify the number of the affinity group for which detailed information is to be displayed, using either decimal or hexadecimal notation. For example, specify affinity group number 16 as either "-affinitygroup 16" in decimal or "-affinitygroup 0x10" in hexadecimal.

If this option is omitted, a list of affinity groups will be displayed.

-csv

Displays the affinity group information in the CSV format.

If this option is omitted, it is displayed in the table format.

EXAMPLES

- Creating an affinity group and displaying the created affinity group in the table format.

```
> storageadm affinity add -ipaddr 1.2.3.4 -volume 16,17,18 -lun 0,1,2 -affinitygroup 16
<<< AffinityGroup ADD >>>
NUMBER
-----
0x0010
-----
INFO:swsag0001:Command terminated normally.
```

- Creating an affinity group and displaying the created affinity group in the CSV format.

```
> storageadm affinity add -ipaddr 1.2.3.4 -volume 16,17,18 -lun 0,1,2 -affinitygroup 16 -csv
NUMBER
0x0010
```

- Deleting an affinity group.

```
> storageadm affinity delete -ipaddr 1.2.3.4 -affinitygroup 16
Are you sure? [y/n]: y
INFO:swsag0001:Command terminated normally.
```

- Adding a LUN in the affinity group.

```
> storageadm affinity update -ipaddr 1.2.3.4 -affinitygroup 16 -add -volume 19 -lun 3
Are you sure? [y/n]: y
INFO:swsag0001:Command terminated normally.
```

- Deleting a LUN from the affinity group.

```
> storageadm affinity update -ipaddr 1.2.3.4 -affinitygroup 16 -delete -volume 19
Are you sure? [y/n]: y
INFO:swsag0001:Command terminated normally.
```

- Displaying the affinity group lists in the table format.

```
> storageadm affinity info -ipaddr 1.2.3.4
<<< AffinityGroup Information >>>
NUMBER NAME
-----
0x0000 AG00
0x0001 AG01
0x0002 AG02
0x0003 AG03
-----
INFO:swsag0001:Command terminated normally.
```

- Displaying the affinity group lists in the CSV format.

```
> storageadm affinity info -ipaddr 1.2.3.4 -csv
NUMBER,NAME
0x0000,AG00
0x0001,AG01
0x0002,AG02
0x0003,AG03
```

- Displaying the affinity group detail information (mapping) in the table format.

```
> storageadm affinity info -ipaddr 1.2.3.4 -affinitygroup 16
<<< AffinityGroup Information >>>
NUMBER NAME          LUN    VOLUME  VOLUME NAME
-----
0x0010 abcd           0x0000 0x0001  sample
                        0x0002 0x0004
-----
INFO:swsag0001:Command terminated normally.
```

- Displaying the affinity group detail information (mapping) in the CSV format.

```
> storageadm affinity info -ipaddr 1.2.3.4 -affinitygroup 16 -csv
NUMBER,NAME,LUN,VOLUME,VOLUME NAME
0x0010,abcd,0x0000,0x0001,sample
0x0010,abcd,0x0002,0x0004,
```

- Displaying the linked affinity group detail information (mapping) in the table format.

```
> storageadm affinity info -ipaddr 1.2.3.4 -affinitygroup 16
<<< AffinityGroup Information >>>
NUMBER NAME          LUN    VOLUME  VOLUME NAME
-----
0x0010,0x011 abcd    0x0000 0x0001  sample
                        0x0002 0x0004
```

INFO:swsag0001:Command terminated normally.

- Displaying the linked affinity group detail information (mapping) in the CSV format.

```
> storageadm affinity info -ipaddr 1.2.3.4 -affinitygroup 16 -csv  
NUMBER,NAME,LUN,VOLUME,VOLUME NAME  
"0x0010,0x011",abcd,0x0000,0x0001,sample  
"0x0010,0x011",abcd,0x0002,0x0004,
```

NOTES

- The message below will be output if the -s option is not specified when either the "delete" operand or the "update" operand is specified. Enter "y" to continue or "n" to cancel.

This message can be suppressed by specifying the -s option.

```
Are you sure? [y/n]:
```

- The command will terminate abnormally if the -delete option is specified with the "update" operand in such a way that there are no items of mapping information for the affinity group.
- The command will terminate abnormally if the "add" operand or the "update" operand contains the number of a volume that cannot be set to an affinity group, such as:
 - Volume that does not exist in the storage device
 - Volume that is not open
 - LUN concatenated volume
 - ODX Buffer Volume
- To display a concatenated affinity group when the "info" operand is specified, specify the the concatenated source affinity group in the -affinitygroup option.

11.1.2.5 storageadm ecomode (Eco-mode management command)

NAME

storageadm ecomode - Operates the Eco-mode

SYNOPSIS

```
storageadm ecomode on -ipaddr i paddr  
storageadm ecomode off -ipaddr i paddr [-s]  
storageadm ecomode info -ipaddr i paddr [-csv]
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\sbin\storageadm ecomode
```

(*\$INS_DIR* means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVssmgr/sbin/storageadm ecomode
```

DESCRIPTION

This command toggles and displays Eco-mode information for ETERNUS Disk storage systems registered with this product.

OPERANDS

on

Sets the Eco-mode to ON.

off

Sets the Eco-mode to OFF.

info

Displays the Eco-mode status.

OPTIONS

Options of the on operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

Options of the off operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-s

Continues processing without asking for confirmation.

Options of the info operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-CSV

Displays the Eco-mode status of the ETERNUS Disk storage system in the CSV format.
if this option is omitted, it is displayed in the table format.

EXAMPLES

- Setting the Eco-mode to ON:

```
> storageadm ecomode on -ipaddr 1.2.3.4
INFO:swsag0001:Command terminated normally.
```

- Setting the Eco-mode to OFF:

```
> storageadm ecomode off -ipaddr 1.2.3.4
Are you sure? [y/n]:y
INFO:swsag0001:Command terminated normally.
```

- Displaying the Eco-mode information:

```
> storageadm ecomode info -ipaddr 1.2.3.4

<<< EcoMode Information>>
STATUS
-----
ON
-----
INFO:swsag0001:Command terminated normally.
```

- Displaying the Eco-mode information in CSV format:

```
> storageadm ecomode info -ipaddr 1.2.3.4 -csv
STATUS
ON
```

NOTES

- If the "off" operand is specified without the -s option, then the following message is displayed:
Enter "y" to continue or "n" to cancel.
This message can be suppressed by specifying the -s option.

```
Are you sure? [y/n]:
```

- If the device Eco-mode settings are as follows, the command terminates with an error:
 - The processing to switch Eco-mode on is executed when the Eco-mode is already on.

11.1.2.6 storageadm port (Port management command)

NAME

storageadm port - Collects a list of port information

SYNOPSIS

```
storageadm port info -ipaddr ipaddr [-csv]
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\sbin\storageadm port
```

(\$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVssmgr/sbin/storageadm port
```

DESCRIPTION

This command displays the port information of the ETERNUS Disk storage systems registered with this software.

OPERANDS

info

Displays a list of port information.

OPTIONS

Options of the info operand

```
-ipaddr ipaddr
```

Specify the IP address of the storage device.

-CSV

Displays the port information in the CSV format.
If this option is omitted, it is displayed in the table format.

EXAMPLES

- Displaying port information in table format.

```
# /opt/FJSVssmgr/sbin/storageadm port info -ipaddr 1.2.3.4
<<< port Information >>>
PORT ID,PORT NAME,STATUS,TYPE,AFFINITY,PORT ADDRESS,SUPPLEMENT INFORMATION
-----
000,CM0CA0Port0,Online,FC-CA,On,1234567890ABCDEE,-
001,CM0CA0Port1,Online,FC-CA,On,1234567890ABCDEF,-
100,CM1CA0Port0,Online,iSCSI-CA,On,192.168.1.1,iqn.iscsi.name
101,CM1CA0Port1,Online,iSCSI-CA,On,192.168.1.2,iqn.iscsi.name
-----
INFO:swsag0001:Command terminated normally.
```

- Displaying port information in CSV format.

```
# /opt/FJSVssmgr/sbin/storageadm port info -ipaddr 1.2.3.4 -csv
PORT ID,PORT NAME,STATUS,TYPE,AFFINITY,PORT ADDRESS,SUPPLEMENT INFORMATION
000,CM0CA0Port0,Online,FC-CA,On,1234567890ABCDEE,-
001,CM0CA0Port1,Online,FC-CA,On,1234567890ABCDEF,-
100,CM1CA0Port0,Online,iSCSI-CA,On,192.168.1.1,iqn.iscsi.name
101,CM1CA0Port1,Online,iSCSI-CA,On,192.168.1.2,iqn.iscsi.name
```

NOTES

- SAS port information is not displayed.
- With the SAS model devices of the following storage devices, the command terminates with an error.
 - ETERNUS DX60/DX60 S2/DX80
 - ETERNUS2000

11.1.2.7 storageadm iscsiport (iSCSI port management command)

NAME

storageadm iscsiport - Operates iSCSI ports

SYNOPSIS

```
storageadm iscsiport set -ipaddr ipaddr -port portID {[-portipaddr port_ipaddr] [-netmask port_netmask] [-gateway gateway_ipaddr] [-isns iSNS_server_ipaddr] [-iscsi iSCSI name] [-alias alias] [-affinity {on | off}] [-ipv4 {on | off}] [-ipv6localip local_ipaddr] [-ipv6connip connect_ipaddr] [-ipv6gateway v6gateway_ipaddr] [-ipv6 {on | off}]} [-s]
```

```
storageadm iscsiport info -ipaddr ipaddr [-port portID [-expand]] [-csv]
```

```
storageadm iscsiport ping -ipaddr ipaddr -port portID -target target_ipaddr [-count ping_count] [-csv]
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\sbin\storageadm iscsiport
```

(\$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVssmgr/sbin/storageadm iscsiport
```

DESCRIPTION

This command displays the iSCSI port settings and information of the ETERNUS Disk storage systems registered with this software.

Specify the storage device IP address and the iSCSI port setting information in the command parameters in order to set the iSCSI port settings and to display the set iSCSI port information and the IP reachability status of the iSCSI network to which the storage device is connected.

OPERANDS

set

Sets iSCSI port information.

info

Displays a list of iSCSI port information.

If -port is specified, detailed information concerning the specified iSCSI port is displayed.

If both -port option and -expand option are specified at the same time, the extended information for iSCSI port is displayed.

ping

Issues a ping to check the IP reachability status of the iSCSI network to which the storage device is connected and displays the result.

OPTIONS

Options of the set operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-port *portID*

Specify the port ID of the iSCSI port.

For ETERNUS DX60/DX60 S2/DX80/DX90, the port ID is the CM number and the port number entered, and for ETERNUS DX80 S2/DX90 S2, ETERNUS DX400/DX400 S2 series, ETERNUS DX8000/DX8000 S2 series, ETERNUS4000, and ETERNUS8000, the port ID is the CM number, the CA number and the port number entered.

-portipaddr *port_ipaddr*

Specify the IP address of the iSCSI port.

-netmask *port_netmask*

Specify the subnet mask of the iSCSI port.

-gateway *gateway_ipaddr*

Specify the IP address of the gateway server for the iSCSI port.

Specify the following if delete the gateway server setting.

```
-gateway " "
```

-isns *iSNS_server_ipaddr*

Specify the IP address of the iSNS server for the iSCSI port.

Specify the following if delete the iSNS server settings.

```
-isns " "
```

If IPv4 configuration for the iSCSI port is invalid, IPv4 address cannot be specified.

If IPv6 configuration for the iSCSI port is invalid, IPv6 address cannot be specified.

-iscsi *iSCSI_name*

Specify the iSCSI name of the iSCSI port.

Specify the following if you want to set default iSCSI name.

```
-iscsi " "
```

-alias *alias_name*

Specify the alias of the iSCSI port.

-affinity {on | off}

Specify the security setting for the iSCSI port. If set to ON, specify as "-affinity on". If set to OFF, specify as "-affinity off".

-ipv4 {on | off}

Specify IPv4 setting for the iSCSI port. To enable IPv4 setting, specify "-ipv4 on" and to disable it, specify "-ipv4 off". If "-ipv4 off" is specified, IP address, subnet mask and gateway server settings are all deleted from the iSCSI port.

"-ipv4 off" cannot be specified together with the following options and their values:

- -portipaddr
- -netmask
- -gateway
- -ipv6 off

-ipv6localip *local_ipaddr*

Set the IPv6 link local address of the iSCSI port.

-ipv6connip *connect_ipaddr*

Specify the IPv6 connection IP address of the iSCSI port.

When deleting the IPv6 connection IP address setting, specify as below:

```
-ipv6connip " "
```

-ipv6gateway *v6gateway_ipaddr*

Specify the IPv6 gateway address of the iSCSI port.

When deleting the IPv6 gateway address setting, specify as below:

```
-ipv6gateway " "
```

-ipv6 {on | off}

Specify IPv6 settings of the iSCSI port. To enable IPv6 settings, specify "-ipv6 on" and to disable it, specify "-ipv6 off". If "-ipv6 off" is specified, IPv6 link local address, IPv6 connected IP address and IPv6 gateway address settings are all deleted from the iSCSI port.

"-ipv6 off" cannot be specified together with the following options and their values:

- -ipv6localip
- -ipv6connip

- -ipv6gateway
- -ipv4 off

-s

Causes processing to continue without output of a confirmation message.

Options of the info operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-port *port ID*

Displays detailed information concerning the iSCSI ports. If this option is omitted, a list of iSCSI ports is displayed.

For ETERNUS DX60/DX60 S2/DX80/DX90, the port ID is the CM number and the port number entered, and for ETERNUS DX80 S2/DX90 S2, ETERNUS DX400/DX400 S2 series, ETERNUS DX8000/DX8000 S2 series, ETERNUS4000, and ETERNUS8000, the port ID is the CM number, the CA number and the port number entered.

-csv

Displays the port information in the CSV format.

If this option is omitted, it is displayed in the table format.

-expand

Add the following to iSCSI port information to display:

- IPv6 link local address
- IPv6 connection IP address
- IPv6 gateway

Added information depends on the version of the ETERNUS SF system. Upgrading the version of the ETERNUS SF system may increase displayed information.

This option can be specified only when the -port option is specified.

Options of the ping operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-port *port ID*

Specify the port ID of the iSCSI port.

For ETERNUS DX60/DX60 S2, DX80, DX90, the port ID is the CM number and the port number entered, and for ETERNUS DX80 S2/DX90 S2, ETERNUS DX400/DX400 S2 series, ETERNUS DX8000/DX8000 S2 series, ETERNUS4000, and ETERNUS8000, the port ID is the CM number, the CA number and the port number entered.

-target *target_ipaddr*

Specify the IP address of the server that checks the IP reachability status.

-count *ping_count*

Specify a value between 1 and 10 for the number of pings issued to check the IP reachability status. A failure will be displayed if an error response is returned at least once. A success will be displayed if normal responses are returned for all pings.

If this option is omitted, the ping execution count is 1.

-csv

Displays the port information in the CSV format.

If this option is omitted, it is displayed in the table format.

EXAMPLES

- Setting iSCSI port information.

```
> storageadm iscsiport set -ipaddr 1.2.3.4 -port 000 -portipaddr 172.16.4.1
Are you sure? [y/n]: y
INFO:swsag0001:Command terminated normally.
```

- Displaying a list of iSCSI port information in table format.

```
> storageadm iscsiport info -ipaddr 1.2.3.4
<<< iSCSI Port Information >>>
PORT NAME          STATUS TYPE      AFFINITY ISCSI NAME          IP ADDRESS
ID
-----
00  CM0Port0      Online iSCSI-CA On          iqn.2000-09.com.fujitsu:storage-system.e2000:0000000029
172.16.4.38
01  CM0Port1      Online iSCSI-CA Off         iqn.2000-09.com.fujitsu:storage-system.e2000:0000000029
172.16.4.39
10  CM1Port0      Online iSCSI-CA On          iqn.2000-09.com.fujitsu:storage-system.e2000:0000000029
172.16.4.40
11  CM1Port1      Online iSCSI-CA On          iqn.2000-09.com.fujitsu:storage-system.e2000:0000000029
172.16.4.41
-----
INFO:swsag0001:Command terminated normally.
```

- Displaying a list of iSCSI port information in CSV format.

```
> storageadm iscsiport info -ipaddr 1.2.3.4 -csv
PORT ID,NAME,STATUS,TYPE,AFFINITY,ISCSI NAME,IP ADDRESS
00,CM0Port0,Online,iSCSI-CA,On,iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029,172.16.4.38
01,CM0Port1,Online,iSCSI-CA,Off,iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029,172.16.4.39
10,CM1Port0,Online,iSCSI-CA,On,iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029,172.16.4.40
11,CM1Port1,Online,iSCSI-CA,On,iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029,172.16.4.41
```

- Displaying detailed iSCSI port information in table format.

```
> storageadm iscsiport info -ipaddr 1.2.3.4 -port 00
<<< iSCSI Port Information >>>
PORT NAME          TYPE      IP ADDRESS          SUBNET          GATEWAY          ISNS  ISNS SERVER
ISCSI NAME ALIAS NAME TRANSFER BANDWIDTH MTU  AFFINITY HOST          HOST          HOST          RESET RESERVE
ID          ADDRESS          RATE  LIMIT  SIZE MODE  RESPONSE  RESPONSE  SERVER IP  SPECIFIC
SCOPE CANCEL AT
                                     NUMBER  NAME      MODE          CHIP RESET
-----
00  CM0Port0      iSCSI-CA 172.16.4.38      255.255.255.0  172.16.4.1      Off  -
iqn.2000-09.com.fujitsu:storage-system.e2000:0000000029 cm0port0 Auto - - Off 0x000F hresp00F
Normal Mode I_T_L Off
-----
-----
INFO:swsag0001:Command terminated normally.
```

- Displaying detailed iSCSI port information in CSV format.

```
> storageadm iscsiport info -ipaddr 1.2.3.4 -port 00 -csv
PORT ID,NAME,TYPE,IP ADDRESS,SUBNET MASK,GATEWAY,ISNS SERVER,ISNS SERVER IP ADDRESS,ISCSI
```

```

NAME,ALIAS NAME,TRANSFER RATE,BANDWIDTH LIMIT,MTU SIZE,AFFINITY MODE,HOST RESPONSE NUMBER,HOST
RESPONSE NAME,HOST SPECIFIC MODE,RESET SCOPE,RESERVE CANCEL AT CHIP RESET
00,CM0Port0,iSCSI-CA,172.16.4.38,255.255.255.0,172.16.4.1,Off,-,iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029,cm0port0,Auto,-,-,Off,0x000F,hresp00F,Normal Mode,I_T_L,Off

```

- Displaying detailed iSCSI port information in table format including additional information.

```

> storageadm iscsiport info -ipaddr 1.2.3.4 -port 00 -expand
<<< iSCSI Port Information >>>
PORT NAME          TYPE          IP ADDRESS      SUBNET          GATEWAY          ISNS          ISNS SERVER
ISCSI NAME ALIAS NAME TRANSFER BANDWIDTH MTU  AFFINITY HOST      HOST      HOST      RESET RESERVE
LINK LOCAL IP ADDRESS          CONNECT IP ADDRESS          IPV6 GATEWAY
ADDRESS

ID                                MASK                                SERVER IP
ADDRESS                            RATE    LIMIT    SIZE MODE    RESPONSE  RESPONSE  SPECIFIC
SCOPE CANCEL AT

                                NUMBER    NAME        MODE          CHIP RESET
-----
00  CM0Port0    iSCSI-CA 172.16.4.38    255.255.255.0  172.16.4.1    Off    -
iqn.2000-09.com.fujitsu:storage-system.e2000:0000000029 cm0port0 Auto - - Off 0x000F hresp00F
Normal Mode I_T_L Off fe80::128c:24d8:3016:250a:56ff:fe67:a524
2001:100a:ab13:cd24:ef3f:db72:fe11:cd21 2001:1101:cfc1:b4d2:ef73:3f9c:2d11:ca34
-----
INFO:swsag0001:Command terminated normally.

```

- Displaying detailed iSCSI port information in CSV format including additional information.

```

> storageadm iscsiport info -ipaddr 1.2.3.4 -port 00 -expand -csv
PORT ID,NAME,TYPE,IP ADDRESS,SUBNET MASK,GATEWAY,ISNS SERVER,ISNS SERVER IP ADDRESS,ISCSI
NAME,ALIAS NAME,TRANSFER RATE,BANDWIDTH LIMIT,MTU SIZE,AFFINITY MODE,HOST RESPONSE NUMBER,HOST
RESPONSE NAME,HOST SPECIFIC MODE,RESET SCOPE,RESERVE CANCEL AT CHIP RESET,LINK LOCAL IP
ADDRESS,CONNECT IP ADDRESS,IPV6 GATEWAY ADDRESS
00,CM0Port0,iSCSI-CA,172.16.4.38,255.255.255.0,172.16.4.1,Off,-,iqn.2000-09.com.fujitsu:storage-
system.e2000:0000000029,cm0port0,Auto,-,-,Off,0x000F,hresp00F,Normal Mode,I_T_L,Off,fe80::128c:
24d8:3016:250a:
56ff:fe67:a524,2001:100a:ab13:cd24:ef3f:db72:fe11:cd21,2001:1101:cfc1:b4d2:ef73:3f9c:2d11:ca34

```

- Displaying the IP reachability status of the iSCSI network in table format.

```

> storageadm iscsiport ping -ipaddr 1.2.3.4 -port 00 -target 172.16.4.1
<<iSCSI Port Ping Status>>
PORT NAME          TARGET IP          RESULT
ID                ADDRESS
-----
000  CM0CA0Port0 172.16.4.38      Success
-----
INFO:swsag0001:Command terminated normally.

```

- Displaying the IP reachability status of the iSCSI network in CSV format.

```

> storageadm iscsiport ping -ipaddr 1.2.3.4 -port 00 -target 172.16.4.1 -csv
PORT ID,NAME,TARGET IP ADDRESS,RESULT
000,CM0CA0Port0,172.16.4.38,Success

```

NOTES

- The message below is displayed when the "set" operand is specified. Enter "y" to continue, or "n" to cancel. Note that this message is not displayed if the -s option is specified.

```
Are you sure? [y/n]:
```

- If you set BS2000 Mode to Host Specific Mode of Host Response when the iSCSI port is displayed in detail, it is displayed as "Normal Mode" to HOST SPECIFIC MODE.
- The IP address, link local IP address, connection IP address, iSCSI name, and iSCSI alias name of the iSCSI port might not be able to be registered by duplicating with other iSCSI port settings. Refer to [Note] in "[6.1.5 Connectivity Management](#)" for details.

11.1.2.8 storageadm progress (Progress display command)

NAME

storageadm progress - Displays progress information

SYNOPSIS

```
storageadm progress volumeformat -ipaddr ipaddr { [-volume volume_number[,volume_number...]] | [-all] } [-csv]
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\sbin\storageadm progress
```

(*\$INS_DIR* means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVssmgr/sbin/storageadm progress
```

DESCRIPTION

This command displays progress information concerning the formatting of volumes on ETERNUS Disk storage systems registered with this software.

Specify the storage device IP address and the volume number in the command parameters in order to display volume formatting progress information.

OPERANDS

volumeformat

Displays the formatting progress.

OPTIONS

Options of the volumeformat operand

-ipaddr *ipaddr*

Specify the storage device IP address.

-volume *volume number[, volume number,...]*

Specify the numbers for the volumes to be output, using either decimal or hexadecimal notation.

If multiple volume numbers are specified, use commas (",") to separate volume numbers. For example, specify volumes 10 and 16 as either "-volume 10,16" in decimal notation or "-volume 0xa,0x10" in hexadecimal notation.

This displays formatting progress information (including format completion and formatting not yet being implemented) concerning the specified volume.

An error does not occur if the specified volume does not exist, but information is not displayed for that volume.

If this is omitted, progress information is displayed for all volumes for which formatting is in progress. However, if the -all option is specified, the progress information will include volumes not currently being formatted (formatting completed or not yet implemented).

This option cannot be specified at the same time as the -all option.

-all

Includes information concerning volumes not currently being formatted (formatting completed or not yet implemented) in the display.

If this option is omitted, progress information is displayed only for volumes for which formatting is in progress.

This option cannot be specified at the same time as the -volume option.

-csv

This option displays the formatting progress information in the CSV format.

If this option is omitted, it is displayed in the table format.

The table below shows the contents displayed when different combinations of -volume and -all options are specified.

-volume option	-all option	
	Specified	Not specified
Specified	(Cannot be specified.)	The display target is the specified volume, and volumes for which formatting is completed or not yet executed are included in the display.
Not specified	The display target is all volumes on the device, and volumes for which formatting is completed or not yet executed are included in the display.	The display target is all volumes on the device, but the display includes only the volumes for which formatting is in progress.

EXAMPLES

- Displaying the formatting progress information for all volumes in table format.

```
> storageadm progress volumeformat -ipaddr 1.2.3.4 -all
<<< Volume Format Progress Information >>>
NUMBER  NAME                TYPE  STATUS      PROGRESS
-----
0x0000  Volume0x0000       Open  Available   100
0x0001                Open  Available   70
0x0002                Open  Readyng     0
0x0003                Open  Available   -
0x0004                SDV   Available   100
0x0005                SDPV  Available   100
-----
INFO:swsag0001:Command terminated normally.
```

- Displaying the formatting progress information for all volumes in CSV format.

```
> storageadm progress volumeformat -ipaddr 1.2.3.4 -all -csv
NUMBER,NAME,TYPE,STATUS,PROGRESS
0x0000,Volume0x0000,Open,Available,100
```

```
0x0001, ,Open,Available,70
0x0002, ,Open,Readying,0
0x0003, ,Open,Available,-
0x0004, ,SDV,Available,100
0x0005, ,SDPV,Available,100
```

NOTES

- Formatting progress information is displayed for open volumes, SDV volumes, and SDPV volumes, but is not displayed for other volumes.
- If volume formatting fails, the "STATUS" field is as shown below, and 0 to 100 is displayed as the "PROGRESS" field.
 - Broken
 - Data Lost
 - Not Ready
- ODX Buffer Volumes are not displayed.

11.1.2.9 storageadm perfctl (Performance monitoring command)

NAME

storageadm perfctl - Performs monitoring operations

SYNOPSIS

```
storageadm perfctl start -ipaddr ipaddr [-interval time]
```

```
storageadm perfctl stop -ipaddr ipaddr
```

```
storageadm perfctl status -ipaddr ipaddr
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\sbin\storageadm perfctl
```

(\$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVssmgr/sbin/storageadm perfctl
```

DESCRIPTION

This command starts and stops performance monitoring for the NetApp FAS Series and displays the performance monitoring status.

OPERANDS

start

Starts performance monitoring.

stop

Stops performance monitoring.

status

Displays the performance monitoring status.

OPTIONS

Options of the start operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

-interval *time*

Specify either 10, 30, 60, or 300 (seconds unit) as the performance monitoring interval.

If a value other than 10, 30, 60, or 300 is set, the actual interval is set according to the table below (an error will occur if it is set to a negative value or a value greater than or equal to 2147483648):

Specified value	Monitoring interval (in secs)
<i>time</i> = 0	30
0 < <i>time</i> <= 10	10
10 < <i>time</i> <= 30	30
30 < <i>time</i> <= 60	60
60 < <i>time</i>	300

If this option is omitted, monitoring is performed at 30 second intervals.

Options of the stop operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

Options of the status operand

-ipaddr *ipaddr*

Specify the IP address of the storage device.

EXAMPLES

- Starting performance monitoring at 60-second intervals.

```
> storageadm perfctl start -ipaddr 1.2.3.4 -interval 60
```

- Stopping performance monitoring.

```
> storageadm perfctl stop -ipaddr 1.2.3.4
```

- Displaying the performance monitoring status.

```
> storageadm perfctl status -ipaddr 1.2.3.4
<<< Performance Monitor Status>>
DEVICE_NAME(IP_ADDRESS)          STATUS          INTERVAL[ SEC ]
-----
NR1000F(1.2.3.4)                 Monitoring      60
-----
```

INFO:swsag0001:Command terminated normally.

The explanation of the information displayed in each field is as follows.

Title	Explanation
DEVICE_NAME(IP_ADDRESS)	Displays the device name and its IP address.

Title	Explanation
STATUS	Displays the monitoring status. <ul style="list-style-type: none"> - "Monitoring": Normal monitoring is in progress. - "Stop": Performance monitoring is stopped. - "Recovering": Retry is in progress, after communication was interrupted or an attempt failed. - "Error": Stopped with an error, after an unsuccessful retry. Collect the information required for troubleshooting and contact a Fujitsu system engineer. Refer to "B.1 Troubleshooting information" for details.
INTERVAL[sec]	Displays the performance monitoring interval (seconds).

NOTES

- The NetApp FAS Series must be registered with this product.

11.1.2.10 storageadm device (Device management command)

NAME

storageadm device - Operation of devices

SYNOPSIS

```
storageadm device unlock -ipaddr ipaddr [-s]
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Manager\opt\FJSVssmgr\sbin\storageadm device
```

(\$INS_DIR means "Program Directory" specified at the ETERNUS SF Manager installation.)

Solaris or Linux environment

```
/opt/FJSVssmgr/sbin/storageadm device
```

DESCRIPTION

This command unlocks the storage device.

OPERANDS

unlock

Unlocks the storage device.

OPTIONS

Options of the unlock operand

`-ipaddr ipaddr`

Specify the IP address of the storage device.

`-s`

Continues the processing without a confirmation message being output.

EXAMPLES

- Unlock the storage device.

```
> storageadm device unlock -ipaddr 1.2.3.4  
Are you sure? [y/n]: y
```

NOTES

- You can release only locks which are locked by using this software.
- If you release the lock, do not perform other operations by using this software.

11.2 Agent Commands

This section explains command operations on the Managed Server.

11.2.1 setagtip (Agent information change command)

NAME

`setagtip` - Changes the Storage Cruiser's agent information

SYNOPSIS

```
setagtip [-i ipaddr]
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Agent\bin\setagtip
```

(`$INS_DIR` means "Program Directory" specified at the Storage Cruiser's agent installation.)

Solaris, Linux, HP-UX, or AIX environment

```
/opt/FJSVssage/bin/setagtip
```

DESCRIPTION

This command sets Storage Cruiser's agent information.

In the Windows environment, only a user of the Administrators group can execute this command.

In the Solaris, Linux, HP-UX, or AIX environment, only OS administrator (root) user can execute this command.

To change the start IP address of Storage Cruiser's agent, specify an IP address to set the information.

OPTIONS

-i ipaddr

Specify the IP address of the server node that can communicate from the Management Server. The start IP address of the Storage Cruiser's agent is set to the specified IP address.

If this option is omitted, the current setting information is displayed.

When specifying IPv6 address, specify a global address.

As for IPv6 address display format, the Web Console displays IP addresses with reference to RFC5952. For this reason, they may be different from those specified by this command.

EXAMPLES

- Displaying the Storage Cruiser's agent information

```
> setagtip
```

- Setting the Storage Cruiser's agent IP address to 10.12.13.14

```
> setagtip -i 10.12.13.14
```

NOTES

If the host name cannot be resolved from the specified IP address, the messages shown below is displayed. Check for an error in the specified IP address or network definition (hosts, DNS, etc.), and re-execute the command.

```
IP Address = IP_address : Host's Name is not found.
```

11.2.2 traptest (SNMP Trap test for server node agent)

NAME

traptest - tests of SNMP Trap

SYNOPSIS

```
traptest [ipaddr]
```

COMMAND PATH

Windows environment

```
$INS_DIR\ESC\Agent\bin\traptest
```

(*\$INS_DIR* means "Program Directory" specified at the Storage Cruiser's agent installation.)

Solaris, Linux, HP-UX, or AIX environment

```
/opt/FJSVssage/bin/traptest
```

DESCRIPTION

This command checks whether SNMP Trap is correctly transmitted to the Management Server from a server node agent, display an event, and check the linkage with Shell/Bat. The Centric Manager linkage is not operated by this command.

If the action on SNMP Trap as a test is supposed to be changed, change the SNMP Trap XML definition file (1_3_6_1_4_1_211_4_1_3_21_2_2.xml) for the agent. In SNMP Trap as a test, 1 is used for Specific Trap Type number and the action can be changed by changing the definition of the Specific Trap Type number 1 defined in the SNMP Trap XML definition file. Refer to "[A.6 SNMP Trap XML Definition File](#)" for the SNMP Trap XML definition file.

OPERANDS

ipaddr

Only in the environment where the host holds two or more IP addresses (including loopback IP address, IPv4/IPv6 dual stack), specify a server node's IP address (start IP address of the Storage Cruiser's agent) which the Storage Cruiser's manager recognizes.

When specifying IPv6 address, specify a global address.

As for IPv6 address display format, the Web Console displays IP addresses with reference to RFC5952. For this reason, they may be different from those specified by this command.

OPTIONS

None.

EXAMPLES

- SNMP Trap is transmitted from the server node agent of IP address 11.11.11.11.

```
> traptest 11.11.11.11
```

NOTES

- If the SNMP Trap send destination address is not set to the server node when execute the command, the following results are output.

```
Target Host Nothing
SNMPTrap error
```

- If the server node that input in the command is not registered, re-execute the command after registering the server node.
- Execute the same action in case where the server node is not registered after deletion of the server node.
- The SNMP Trap community name that is issued using this command, is fixed to "public".
- If there is any error in the specified IP address format, the following result is output. Specify a valid IP address to re-execute the action.

```
Invalid parameter: specified IP Address
SNMPTrap error
```

11.2.3 agentsnap (Troubleshooting information collection of Agent)

NAME

agentsnap - Collects the troubleshooting information of Agent

SYNOPSIS

Windows environment

```
agentsnap -dir dirname [-all]
```

Solaris or Linux environment

```
agentsnap [-dir dirname] [-all]
```

COMMAND PATH

Windows environment

```
$INS_DIR\Agent\sbin\agentsnap
```

(*\$INS_DIR* means "Program Directory" specified at the Storage Cruiser's agent installation.)

Solaris or Linux environment

```
/opt/FJSVssage/sys/agentsnap
```

DESCRIPTION

This command collects the troubleshooting information of the Storage Cruiser's agent.

In the Windows environment, only a user of the Administrators group can execute this command.

In the Solaris or Linux environment, only OS administrator (root) user can execute this command.

Execute this command to collect the troubleshooting information when a problem occurs on the Storage Cruiser's agent, and submit its information to a Fujitsu system engineer.

OPTIONS

-dir *dirname*

Corrects the troubleshooting information on *dirname* directory.

In the Windows environment, specify the full path name that starts from the drive letter for *dirname*. The maximum length that can be specified for *dirname* is 100 bytes.

In the Solaris or Linux environment, specify the full path name for *dirname*. If this option is omitted, the troubleshooting information is stored on /tmp directory.

The collected information is gathered in the file that its name starts by "agentsnap_". Before executing this command, confirm that *dirname* directory has the following free space.

Collected information	Required free space
Initial investigation information	more than 10MB
All troubleshooting information	more than 30MB

-all

Collects all troubleshooting information on servers. Data includes lots of information, which will increase the size of the data. This option is not necessary for initial investigation.

EXAMPLES

Windows environment

- Collecting the troubleshooting information for initial investigation on D:\temp directory.

```
> agentsnap -dir D:\temp
```

Solaris or Linux environment

- Collecting the troubleshooting information for initial investigation.
- > agentsnap

11.3 Starting and Stopping the Manager

This section explains how to start and stop the service/daemon of the Storage Cruiser's manager.

11.3.1 Starting and stopping services (Windows environment)

This sub section explains how to start and stop the services of the Storage Cruiser's manager in the Windows environment.

11.3.1.1 Starting and stopping the SNMP Trap monitoring service

In Windows Server 2003 and Windows Server 2008 or later, the name of the SNMP Trap monitoring service is different as follows:

OS version	SNMP Trap monitoring service name
Windows Server 2003	SNMP Trap Service
Windows Server 2008 or later	SNMP Trap

- Starting the SNMP Trap monitoring service
 1. Open the **Services** window.
 - For Windows Server 2012
Click [Control Panel] - [System and Security] - [Administrative Tools] - [Services].
 - For Windows environment other than above
Click [Control Panel] - [Administrative Tools] - [Services].
 2. Select the SNMP Trap monitoring service, and click the [Start] button.
- Stopping the SNMP Trap monitoring service
 1. Open the **Services** window.
 - For Windows Server 2012
Click [Control Panel] - [System and Security] - [Administrative Tools] - [Services].
 - For Windows environment other than above
Click [Control Panel] - [Administrative Tools] - [Services].
 2. Select the SNMP Trap monitoring service, and click the [Stop] button.
- Checking the SNMP Trap monitoring service
 1. Open the **Services** window.
 - For Windows Server 2012
Click [Control Panel] - [System and Security] - [Administrative Tools] - [Services].
 - For Windows environment other than above
Click [Control Panel] - [Administrative Tools] - [Services].
 2. Check that the **Status** field of the SNMP Trap monitoring service status is "Started".



Note

The SNMP Trap monitoring service is an OS standard service. Do not stop the SNMP Trap monitoring service unless there is a special reason, because it will affect other products such as ServerView AlarmService and ServerView Resource Coordinator VE, etc.

11.3.1.2 Starting and stopping the service

- Starting the service
 1. Open the **Services** window.
 - For Windows Server 2012
Click [Control Panel] - [System and Security] - [Administrative Tools] - [Services].
 - For Windows environment other than above
Click [Control Panel] - [Administrative Tools] - [Services].
 2. Select the service "ETERNUS SF Storage Cruiser Manager", and click the [Start] button.
- Stopping the service
 1. Open the **Services** window.
 - For Windows Server 2012
Click [Control Panel] - [System and Security] - [Administrative Tools] - [Services].
 - For Windows environment other than above
Click [Control Panel] - [Administrative Tools] - [Services].
 2. Select the service "ETERNUS SF Storage Cruiser Manager", and click the [Stop] button.

11.3.2 Starting and stopping daemons (Solaris environment)

This sub section explains how to start and stop the daemons of the Storage Cruiser's manager in the Solaris environment.

11.3.2.1 Starting and stopping the SNMP Trap monitoring daemon

Only OS administrator (root) user can execute following commands.

- Starting the SNMP Trap monitoring daemon
Execute the following command.

```
# /opt/FJSVswstt/bin/mpnm-trapd start
```
- Stopping the SNMP Trap monitoring daemon
Execute the following command.

```
# /opt/FJSVswstt/bin/mpnm-trapd stop
```
- Checking the SNMP Trap monitoring daemon
Execute the following command.

```
# /bin/ps -ef | grep nwsnmp-trapd | grep -v grep
```

11.3.2.2 Starting and stopping the daemons at specific times

Start or stop the following daemons in a batch operation:

- Management Server daemon
- SNMP Trap monitoring daemon

Only OS administrator (root) user can execute following commands.

- Starting daemons

Execute the following command.

```
# /opt/FJSVssmgr/sbin/managerctl start
```

- Stopping daemons

Execute the following command.

```
# /opt/FJSVssmgr/sbin/managerctl stop
```



Information

In an environment in which the SAN administration manager in SystemWalker/StorageMGR-M V5.1/V10 or Softek SANView4.1 CD-ROM sub-directory is installed, the SNMP Trap monitoring daemon is controlled by SystemWalker/StorageMGR-M (SAN administration manager in Softek SANView4.1 CD-ROM sub-directory), so only the Management Server daemon is started and stopped by the above commands.

11.3.3 Starting and stopping daemons (Linux environment)

This sub section explains how to start and stop the daemons of the Storage Cruiser's manager in the Linux environment.

11.3.3.1 Starting and stopping the SNMP Trap monitoring daemon

The procedure to start and stop the SNMP Trap daemon on the Management Server is different between when monitoring only IPv4 address assigned devices and when monitoring both IPv4 and IPv6 addresses assigned devices.

When monitoring only IPv4 address assigned devices

Only OS administrator (root) user can execute following commands.

- Starting the SNMP Trap monitoring daemon

Execute the following command.

```
# /etc/init.d/snmptrapd start
```



Note

In an environment where the ServerView trap distributor program (SMAWtrpsv) is used, use the following procedure to start the daemon:

```
# /etc/init.d/trpsrzd stop
# /etc/init.d/snmptrapd start
# /etc/init.d/trpsrzd start
```

- Stopping the SNMP Trap monitoring daemon

Execute the following command.

```
# /etc/init.d/snmptrapd stop
```



Do not stop the daemon unless there is a special reason, because it affects other software using snmptrapd.

- Checking the SNMP Trap monitoring daemon

Execute the following command.

```
# /bin/ps -ef | grep snmptrapd | grep -v grep
```

When monitoring both IPv4 and IPv6 addresses assigned devices

If the settings are done in order to monitor IPv6 address assigned devices in the following sections in the *ETERNUS SF Installation and Setup Guide*, use the following procedure to start/stop the SNMP Trap daemon:

- "SNMP Trap setting (for Linux)" in "Setup of Storage Cruiser's manager"

Only OS administrator (root) user can execute following commands.

- Starting the SNMP Trap monitoring daemon

Execute the following command.

```
# /opt/FJSVswstt/bin/mpnm-trapd start
```

- Stopping the SNMP Trap monitoring daemon

Execute the following command.

```
# /opt/FJSVswstt/bin/mpnm-trapd stop
```

- Checking the SNMP Trap monitoring daemon

Execute the following command.

```
# /bin/ps -ef | grep nwsnmp-trapd | grep -v grep
```

11.3.3.2 Starting and stopping the daemon

Only OS administrator (root) user can execute following commands.

- Starting daemons

Execute the following command.

```
# /opt/FJSVssmgr/sbin/managerctl start
```

- Stopping daemons

Execute the following command.

```
# /opt/FJSVssmgr/sbin/managerctl stop
```



If the settings are done in order to monitor IPv6 address assigned devices in the following sections in the *ETERNUS SF Installation and Setup Guide*, the SNMP Trap daemon is also started / stopped at the same time:

- "SNMP Trap setting (for Linux)" in "Setup of Storage Cruiser's manager"

11.4 Starting and Stopping the Agent

This section explains how to start and stop the service/daemon of the Storage Cruiser's agent.

11.4.1 Starting and stopping services (Windows environment)

Start or stop the service of the Storage Cruiser's agent.

- Starting the service

1. Open the **Services** window.

- For Windows Server 2012

Click [Control Panel] - [System and Security] - [Administrative Tools] - [Services].

- For Windows environment other than above

Click [Control Panel] - [Administrative Tools] - [Services].

2. Select the service "ETERNUS SF Storage Cruiser Agent", and click the [Start] button.

- Stopping the service

1. Open the **Services** window.

- For Windows Server 2012

Click [Control Panel] - [System and Security] - [Administrative Tools] - [Services].

- For Windows environment other than above

Click [Control Panel] - [Administrative Tools] - [Services].

2. Select the service "ETERNUS SF Storage Cruiser Agent", and click the [Stop] button.

11.4.2 Starting and stopping daemons (Solaris, Linux, HP-UX, or AIX environment)

Only OS administrator (root) user can execute following commands.

- Starting the daemon

Execute the following command.

```
# /opt/FJSVssage/bin/sstorageagt
```

- Stopping the daemon

Execute the following command.

```
# /opt/FJSVssage/bin/pstorageagt
```

Appendix A Customization

A.1 Overview

This software Manager and Agent control setting can be made by editing the appropriate definition files. Edit the files according to requirements. However, be sure not to edit values of parameters not discussed in this chapter.

sanma.conf (definition file)

Indicates a detailed setting file of the storage management.

ssmgr.conf (definition file for correlation management)

Indicates a detailed setting file of the storage management for the correlation management.

perf.conf (performance management definition file)

Indicates a detailed setting file of the storage performance management

SNMP Trap XML definition file (fault management definition file)

Creating this file enables detailed definitions of targets of fault monitoring using SNMP Traps and processing for the environment.

Correlation.ini (Agent definition file)

Indicates a detailed setting file of Agent.

A.2 sanma.conf Parameter

This file is saved at the following location as a detailed setting file of the storage management:

Platform of Manager	Location
Windows	\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\sanma.conf (\$ENV_DIR means "Environment Directory" specified at the Manager installation.)
Solaris OS, Linux	/etc/opt/FJSVssmgr/current/sanma.conf

Reflecting the contents of the setting file

If the setting file is changed, execute re-read definition file by using the Web Console, or reactivate the Manager. This reflects the settings on this software.

Customization

Note

Note that the memory or the disk capacity may become insufficient when the number of generations or the maximum capacity of each log file is increased. Operation may stop when the memory or the disk capacity becomes insufficient.

Note when changing the number of generations or maximum capacity, secure the memory capacity and the disk capacity.

AUTODISCOVER_SUBNET

Specify the address of a subnet searched during an automatic device search. Use a "," (comma) to define multiple subnets.

```
Example:
AUTODISCOVER_SUBNET="10.12.13.255,133.134.13.255";
```

The Management Server issues SNMP broadcasts for automatic device detection in these subnets, but if the broadcast is limited by network settings, this function is not enabled.

LOGICAL_MANAGER_IP

If the Management Server is clustered system which has physical IPs and logical IP, logical IP address must be specified in this parameter. For this parameter, specify only IPv4 format IP address.

```
Example:
LOGICAL_MANAGER_IP="10.12.13.14";
```

This parameter is used to automatically configure a SNMP Trap send destination address for a fault monitoring device when adding devices. Refer to "[5.2.5 SNMP Trap transmission place automatic setting function](#)" for more information.

LOGICAL_MANAGER_V6IP

If the Management Server is clustered system which has physical IPs and logical IP, logical IP address must be specified in this parameter. For this parameter, specify only IPv6 format IP address.

```
Example:
LOGICAL_MANAGER_V6IP="2001:db8::2:1";
```

This parameter is used to automatically configure a SNMP Trap send destination address for a fault monitoring device when adding devices. Refer to "[5.2.5 SNMP Trap transmission place automatic setting function](#)" for more information.

MANAGER_LAN_CARD_IP

This is specified if device detection and registration fail due to the environment having the Management Server which holds multiple IP addresses.

If specifying this parameter in a cluster environment, be sure to specify a logical IP address at the beginning.

For this parameter, specify only IPv4 format IP address.

```
Example:
MANAGER_LAN_CARD_IP="10.12.13.14,100.101.102.103";
```

MANAGER_LAN_CARD_V6IP

This is specified if device detection and registration fail due to the environment having the Management Server which holds multiple IP addresses.

If specifying this parameter in a cluster environment, be sure to specify a logical IP address at the beginning.

For this parameter, specify only IPv6 format IP address.

```
Example:
MANAGER_LAN_CARD_V6IP="2001:db8::2:1,2001:db8::2:2";
```

SET_SW_ZONING_ALWAYS

When an access path is set, if the zoning setting for the Fibre Channel switch need not be added because port zoning is set, this software does not generally set zoning for Fibre Channel. Specifying 1 in this parameter sets one-to-one WWPN zoning even in the above case (excluding cases in the No Security state):

```
Example:
SET_SW_ZONING_ALWAYS=1; (Default: 0)
```

DISPLAY_SNMP_STANDARD_EVENT

Specify whether the SNMP Trap (Cold Start Trap etc.) common to devices from a device is indicated in the event log. Setting 1 for this parameter indicates the SNMP Trap common to devices. Setting 0 for this parameter does not indicate it. Default is 1 (indicate).

```
Example:
DISPLAY_SNMP_STANDARD_EVENT = 0;
```

SNMP_COMMUNITY_NAME_FOR_IP

This specifies the name of the SNMP Community used when this software communicates with devices using SNMP protocol. However, if the Community names being used are "public" (Read-direction) and "private" (Write-direction), filling in this parameter is not necessary.

Specify the IP address of the device and the community name used for SNMP communication with the device, delimiting them with a space.

Note that a community name that includes space characters cannot be set in this parameter.

When setting "abc" as the community name used for SNMP communication with IP address 10.11.12.13, set as follows:

```
Example:
SNMP_COMMUNITY_NAME_FOR_IP="10.11.12.13 abc";
```

Wild card definitions in which "*" is used at the end of the IP address is permitted. However, for IPv6 address, a wild card using "*" cannot be defined.

```
Example:
SNMP_COMMUNITY_NAME_FOR_IP="10.11.12.* abc";
SNMP_COMMUNITY_NAME_FOR_IP="20.21.*.* def";
SNMP_COMMUNITY_NAME_FOR_IP="30.*.*.* ghi";
```

To define community names for multiple devices, specify the names on as many definition lines as the number of devices.

```
Example:
SNMP_COMMUNITY_NAME_FOR_IP="10.11.12.13 abc";
SNMP_COMMUNITY_NAME_FOR_IP="10.11.14.15 def";
```

If community names must be different in the READ-direction and WRITE-direction of SNMP communication, specify a device IP address, community name used for READ-direction, and community name used for WRITE-direction, delimiting them with a space.

When setting "abc" as the READ-direction community name and "def" as the WRITE-direction community name used for SNMP communication with IP address 10.11.12.13, set as follows:

```
Example:
SNMP_COMMUNITY_NAME_FOR_IP="10.11.12.13 abc def";
```

SNMP_COMMUNITY_NAME_FOR_AUTODISCOVER

Using the SNMP protocol, the Intra-subnet device detection function detects devices. If "public" is used as the SNMP community name, it is unnecessary to specify this parameter. When a SNMP community name other than "public" is used, specify the name in this parameter. When specifying this parameter, be sure to specify [SNMP_COMMUNITY_NAME_FOR_IP](#).

Note that a community name that includes space characters cannot be set in this parameter.

When community name is "abc," set as follows:

```
Example:
SNMP_COMMUNITY_NAME_FOR_AUTODISCOVER="abc";
```

In an environment where each device has a unique community name, not all devices can be detected even if the parameter is specified. In this case, specify only [SNMP_COMMUNITY_NAME_FOR_IP](#) to search for one device at a time.

LOG_CYCLE

The number of generations of log files (log.* and event.*) of the whole storage management is specified by an arbitrary decimal number. Default is two. It circulates in the second generation (log.0 and log.1 or event.0 and event.1), when 2 is set.

```
Example for circulating in the fifth generation:
LOG_CYCLE = 5;
```

Location of the log file

Platform of Manager	Location
Windows	\$TMP_DIR\ESC\Manager\var\opt\FJSVssmgr\current (\$TMP_DIR means "Work Directory" specified at the Manager installation.)
Solaris OS, Linux	/var/opt/FJSVssmgr/current

LOG_MAX_SIZE

The maximum capacity of the log file (log.* and event.*) of the whole storage management is specified within the range of 0-2147483647 (KB). Default capacity is 1024(KB). When 0 is specified, the log is not output. Moreover, when the value is specified outside the range, it becomes a default value.

```
Example for setting the maximum capacity to 2MB:
LOG_MAX_SIZE = 2048;
```

Refer to "[LOG_CYCLE](#)" for location of the log files.

SNMPTH_LOG_COUNT

The number of generations of log files (snmpth.*) related to SNMP Trap is specified by an arbitrary decimal number.

Default is 2.

It circulates in the second generation (snmpth.0 and snmpth.1), when 2 is set.

```
Example for circulating in the fifth generation:
SNMPTH_LOG_COUNT = 5;
```

Refer to "[LOG_CYCLE](#)" for location of the log files.

SNMPTH_LOG_LIMIT

The maximum capacity of the log file (snmpth.*) related to SNMP Trap is specified within the range of 0-2147483647 (KB).

Default capacity is 1024 (KB).

When 0 is specified, the log is not output. Moreover, when the value is specified outside the range, it becomes a default value.

```
Example for setting the maximum capacity to 2MB:
SNMPTH_LOG_LIMIT = 2048;
```

Refer to "[LOG_CYCLE](#)" for location of the log files.

FIRMWARE_VERSION_CHECK

Any "Unsupported Firmware Version" message output to the event log indicates that a device with firmware not supported by ETERNUS SF Storage Cruiser has been detected. This message is output at the time of an operation.

To suppress output of the message, make the following setting:

```
FIRMWARE_VERSION_CHECK = 0;
```

Since new firmware can be supported by applying certain patches to ETERNUS SF Storage Cruiser, be sure to delete this setting after applying the patches.

SILKWORM_SUPPORTED_FIRMWARE_VERSION

In consideration of incompatibility of Fibre Channel switch firmware, if unsupported firmware is detected, all functions including the configuration management functions are restricted. Normally, in such cases, patches need to be applied to ETERNUS SF Storage Cruiser. However, when such firmware has no incompatibility, it can be handled without applying patches.



Make this setting only for firmware that is confirmed to have no incompatibility.

The procedure for upgrading firmware is described in the firmware upgrade manual.

If it is impossible to confirm that firmware has no incompatibility, contact your Fujitsu CE or SE.

For example, to handle the firmware that has no incompatibility and whose version is v12.34.56a, make settings as follows.
 First, change each of the three numeric values in firmware version v12.34.56a to a two-digit value in hexadecimal notation.
 Characters such as the first "v" and the last "a" need not be considered.

```
12 -> 0C
34 -> 22
56 -> 38
```

Then, these three two-digit values are concatenated to produce a six-digit value in hexadecimal notation.

```
0C2238
```

Specify this value as follows:

```
SILKWORM_SUPPORTED_FIRMWARE_VERSION = "0C2238";
```

When specifying multiple versions, delimit them with a comma ",".
 To specify both v2.4.1 and v5.0.1, describe them as follows:

```
SILKWORM_SUPPORTED_FIRMWARE_VERSION = "020401,050001";
```

The hyphen "-" can be used to specify a range of version.
 To specify versions v4.0.0 to v4.2.2, describe them as shown below. Be sure to describe the smaller version number first.

```
SILKWORM_SUPPORTED_FIRMWARE_VERSION = "040000-040202";
```

Also, the above description methods can be combined.

```
SILKWORM_SUPPORTED_FIRMWARE_VERSION = "020401,040000-040202,050001";
```

A.3 ssmgr.conf Parameter

This file is saved at the following location as a detailed setting file of the storage management for the correlation management:

Platform of Manager	Location
Windows	\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\ssmgr.conf (\$ENV_DIR means "Environment Directory" specified at the Manager installation.)
Solaris OS, Linux	/etc/opt/FJSVssmgr/current/ssmgr.conf

Reflecting the contents of the setting file

If the setting file is changed, execute re-read definition file by using the Web Console, or reactivate the Manager. This reflects the settings on this software.

Customization



Note that the memory or the disk capacity may become insufficient when the number of generations or the maximum capacity of each log file is increased. Operation may stop when the memory or the disk capacity becomes insufficient.

Note when changing the number of generations or maximum capacity, secure the memory capacity and the disk capacity.

LOG_COUNT

The number of generations of log files (common.*) which is common to system is specified by an arbitrary decimal number.

Default is 2.

It circulates in the second generation (common.0 and common.1), when 2 is set.

```
Example for circulating in the fifth generation:  
LOG_COUNT = 5;
```

Location of the log file

Platform of Manager	Location
Windows	\$TMP_DIR\ESC\Manager\var\opt\FJSVssmgr\current (\$TMP_DIR means "Work Directory" specified at the Manager installation.)
Solaris OS, Linux	/var/opt/FJSVssmgr/current

LOG_LIMIT

The maximum capacity of log file (common.*) which is common to system is specified within the range of 0-2147483647 (KB).

Default capacity is 1024 (KB).

When 0 or a minus value is specified, the log is not output. Moreover, when the value larger than the maximum value is specified, it becomes a default value.

```
Example for setting the maximum capacity to 2MB:  
LOG_LIMIT = 2048;
```

Refer to "[LOG_COUNT](#)" for location of the log files.

SYSTEMLOG_FACILITY (Valid only for Solaris OS Manager and Linux Manager)

Specify a facility name which has system log output destination information if a facility name is changed from the default ("daemon"). The facility name that is specified here must be defined by /etc/syslog.conf. Users can optionally change the system log output destination according to the specified facility name and the level.

Refer to online manuals of each operating system for syslog.conf definition.

A.4 perf.conf Parameter

This file is saved at the following location as a detailed setting file of the storage performance management:

Platform of Manager	Location
Windows	\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\perf.conf (\$ENV_DIR means "Environment Directory" specified at the Manager installation.)
Solaris OS, Linux	/etc/opt/FJSVssmgr/current/perf.conf

Reflecting the contents of the setting file

If the setting file is changed, execute re-read definition file by using the Web Console, or reactivate the Manager. This reflects the settings on this software.

Information

- In performance management, the setting file is referenced once every 4 hours so that changes are reflected even if the above procedure has not been performed.
- If the number of days to retain performance data is reduced, data retained that is older than the new number of days will be deleted. When you execute re-read definition file by using the Web Console, it may take a time to delete the performance data.

Customization

Note

- If the number of days performance data is kept is increased, the application may stop because of insufficient memory or disk space; therefore care must be taken to ensure space is sufficient. In particular, if 0 is set for PERF_DATA_KEEP_DAYS, processing to delete performance information stops, so check the memory or disk space regularly.
- If the number of generations of log files is increased, the application may stop because of insufficient memory or disk space, therefore care must be taken to ensure space is sufficient.
- When the performance management for number of active disks is performed, it may not be possible to obtain performance information inside the performance monitoring interval. Change the performance monitoring interval where necessary.

PERF_DATA_KEEP_DAYS

Specify the number of days during which performance management keeps performance data. The data is automatically deleted after the specified number of days elapse.

If 0 is specified, the data is not deleted. However, the number of days does not include the current day.

The default value is seven days and is defined as shown below. Change this value if necessary.

```
PERF_DATA_KEEP_DAYS = 7;
```

LOG_ROTATION

The number of generations of log files (perflog.*) related to performance is specified by an arbitrary decimal number. Default is 2. It circulates in the second generation of perflog.0 and perflog.1 when 2 is set.

```
Example for circulating in the fifth generation:  
LOG_ROTATION = 5;
```

Location of the log file

Platform of Manager	Location
Windows	\$TMP_DIR\ESC\Manager\var\opt\FJSVssmgr\current (\$TMP_DIR means "Work Directory" specified at the Manager installation.)
Solaris OS, Linux	/var/opt/FJSVssmgr/current

ENABLED_ECO_MODE

Specify whether to use the performance management for the active disks, power consumption, and temperature. To use the performance management for them, specify "true". If you do not want to use it, specify "false". The default is "true".

```
Example: When the performance management for the number of active disks, power consumption, and  
temperature is used:  
ENABLED_ECO_MODE = true;
```

ENABLED_PORT_ISCSI

Specify whether to use the performance management for iSCSI port on ETERNUS Disk storage system. To use the performance management for iSCSI port, specify "true". If you do not want to use it, specify "false". The default is "true".

```
Example: When the performance management for iSCSI port is used:  
ENABLED_PORT_ISCSI = true;
```

A.5 Change in the Maximum Memory Used

The maximum memory used can be customized by using the configuration file.

The configuration file is stored in the following directory.

- Manager

Platform of Manager	Location
Windows	\$INS_DIR\ESC\Manager\opt\FJSVssmgr\bin\manager.ini (\$INS_DIR means "Program Directory" specified at the Manager installation.)
Solaris OS, Linux	/opt/FJSVssmgr/bin/manager.ini

Reflecting the contents of the setting file

The customized content is reflected when Manager is started after the customization.

Customization

Customization is not required for normal operation. If the processing time is very long in a large-scale configuration, customize the maximum memory used. Before starting customization, make sure that sufficient memory is installed in the manager and client machines.

The default value is 512 MB and is defined as shown below. Change this value if necessary. (The unit is MB. Up to 9999 can be specified.)

```
Example:  
MAXMEMORY=512
```

A.6 SNMP Trap XML Definition File

Use of this file enables customization of the fault monitoring method. Define the file on the Manager and Agent sides.

SNMP Trap XML definition file on the Manager side

Event log messages and operations using linkage with Systemwalker Centric Manager, linkage with Shell/Bat and linkage with External Script can be defined for SNMP Traps received from individual device (including server node). Customize the contents of this file to change default values of this software on the Manager side according to the operating environment of the storage system used.

Creating this definition file enables a function equivalent to the fault monitoring function for support levels A and B to be implemented for a device of support level I.

The SNMP Trap XML definition file on the Agent side

It defines a fault monitoring method of an Agent server node. Customize its contents to change the monitoring method from default.

Reflecting the contents of the setting file

The setting file on the Manager side is dynamically read into this software and therefore no special reflection method is provided.

The setting file on the Agent side is read into this software statically and therefore the Agent needs to be restarted to reflect the contents of the setting file on this software.

Customization



Note

- If an error is detected in an XML definition file, a message in the format shown below is output to the event log. The fault level of notification is the information level. Linkage with Systemwalker Centric Manager and linkage with Shell/Bat are not used.

```
Message format: "XML parse error (detected trap: (SNMP Trap data character string))"
```

- Except for some devices, all swsag codes that are reported to Systemwalker Centric Manager are 4821.
- When customizing SNMP Trap processing, do not edit the definition file in the installation directory but edit the one in the customization directory.

Definition file names and storage location on the Manager side

The SNMP Trap XML definition file is created for each device. It is then stored in the following directory when Manager is installed or upgraded.

Platform of Manager	Location
Windows	\$INS_DIR\ESC\Manager\opt\FJSVssmgr\lib\snmpth (\$INS_DIR means "Program Directory" specified at the Manager installation.)
Solaris OS, Linux	/opt/FJSVssmgr/lib/snmpth

When customizing SNMP Trap processing of Manager, copy the SNMP Trap XML definition file in the above directory to the customization directory shown below, and edit the copy of the file.

Platform of Manager	Customization Directory
Windows	\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\snmpth (\$ENV_DIR means "Environment Directory" specified at the Manager installation.)
Solaris OS, Linux	/etc/opt/FJSVssmgr/current/snmpth

Manager operates as follows.

- When the SNMP Trap XML definition file exists in the customization directory
 Manager operates in accordance with its file.
- When the SNMP Trap XML definition file does not exist in the customization directory
 Manager operates in accordance with the definition file in the installation directory. (default)

In a trap of a device, the file name is enterprise code in which "." is replaced with "_".

Table A.1 Default SNMP Trap XML definition files on a system where this software is implemented with Manager

Device type	File name
ETERNUS SN200, Brocade, PRIMERGY Fibre Channel switch blade, Brocade VDX series, PRIMERGY BX Ethernet Fabric Switch	1_3_6_1_4_1_1588_2_1_1_1.xml

Device type	File name
ETERNUS SN200 MDS, Cisco MDS	1_3_6_1_4_1_9_9_117_2.xml 1_3_6_1_4_1_9_9_289_1_3.xml 1_3_6_1_4_1_9_9_302_1_3.xml 1_3_6_1_4_1_9_9_305_1_4_3.xml 1_3_6_1_4_1_9_9_91_2.xml
McDATA	1_3_6_1_4_1_289.xml
ETERNUS DX60/DX80/DX90	1_3_6_1_4_1_211_4_1_1_126_1_60.xml
ETERNUS DX80 S2/DX90 S2	1_3_6_1_4_1_211_4_1_1_126_1_100.xml
ETERNUS DX60 S2	1_3_6_1_4_1_211_4_1_1_126_1_101.xml
ETERNUS2000 models 50, 100 and 200	1_3_6_1_4_1_211_4_1_1_126_1_30.xml
ETERNUS4000 models 300 and 500 ETERNUS8000 models 700, 900, 1100 and 2100	1_3_6_1_4_1_211_4_1_1_126_1_20.xml
ETERNUS DX400 series ETERNUS DX8000 series ETERNUS4000 models 400 and 600 ETERNUS8000 models 800, 1200 and 2200	1_3_6_1_4_1_211_4_1_1_126_1_50.xml
ETERNUS DX400 S2 series	1_3_6_1_4_1_211_4_1_1_126_1_100.xml
ETERNUS DX8000 S2 series	1_3_6_1_4_1_211_4_1_1_126_1_102.xml
ETERNUS LT20(SCSI)	1_3_6_1_4_1_11_2_36_1.xml
ETERNUS LT200	1_3_6_1_4_1_119_1_83_1_21.xml
ETERNUS LT210, LT220, LT230	1_3_6_1_4_1_119_1_83_1_1.xml 1_3_6_1_4_1_119_1_83_1_2.xml
ETERNUS LT250	1_3_6_1_4_1_211_4_1_1_126_3_5.xml
ETERNUS LT270	1_3_6_1_4_1_211_4_1_1_126_3_2.xml
ETERNUS LT270 S2	1_3_6_1_4_1_211_4_1_1_126_3_6.xml
Tape encryption device	1_3_6_1_4_1_2021_250_10.xml
Fibre Alliance MIB support device	1_3_6_1_3_94.xml
NetApp FAS Series and V-Series	1_3_6_1_4_1_789.xml
ETERNUS VS850	1_3_6_1_4_1_2_6_190.xml
ETERNUS LT20/LT20 S2/LT40/LT40 S2/LT60/LT60 S2 (SAS/FC model)	1_3_6_1_4_1_20884_10893_2_101_3.xml
ETERNUS CS2000	1_3_6_1_4_1_231_2_48_2_0.xml
Event from performance management	1_3_6_1_4_1_211_4_1_3_21_3.xml
Multipath-related event from Solaris OS Agent or Windows Agent	1_3_6_1_4_1_211_4_1_3_21_2.xml (*1)
Safe/PRIMECLUSTER GDS or GFS series event from Solaris OS Agent	1_3_6_1_4_1_211_4_1_3_21_2_2.xml (*1)(*2)
Multipath-related event from Solaris OS Agent	1_3_6_1_4_1_211_4_1_3_21_2_21.xml (*1) (*2)
Multipath-related event from Windows Agent	1_3_6_1_4_1_211_4_1_3_21_2_5.xml (*1)(*2)
MPIO event from Windows Agent	1_3_6_1_4_1_211_4_1_3_21_2_51.xml (*1) (*2)
ETERNUS multipath driver event from Linux Agent	1_3_6_1_4_1_211_4_1_3_21_2_3.xml (*1)(*2)

Device type	File name
PRIMECLUSTER GDS or GFS series event from Linux Agent	1_3_6_1_4_1_211_4_1_3_21_2_31.xml (*1) (*2)
LVM(PV-Links) event from HP-UX Agent	1_3_6_1_4_1_211_4_1_3_21_2_4.xml (*1)(*2)
HBA driver event from HP-UX Agent	1_3_6_1_4_1_211_4_1_3_21_2_41.xml (*1) (*2)
Multipath-related event from AIX Agent	1_3_6_1_4_1_211_4_1_3_21_2_6.xml (*1)(*2)

*1: This file can be changed only concerning the on/off setting of "linkage with Systemwalker Centric Manager" (only Shell/Bat linkage control can be done and Systemwalker Centric Manager linkage cannot be.) and "external script linkage 1" and "external script linkage 2" in "Operation definition" (the flag attributes) in "Definition contents" of "Definition file format". For "Fault level" and "Message," this file cannot be changed.

*2: When this file is updated, the file with the same name on the Agent side must also be updated so that their contents are the same.

For devices excluding the above ones, SNMP Trap processing for each device is enabled by creating XML files according to the enterprise code of the device.

Definition file name and storage location on the Agent side

The XML definition file for customizing the fault monitoring method of an Agent server node is saved at the following location:

Platform of Agent	Location
Windows	\$ENV_DIR\ESC\Agent\etc\snmpth (\$ENV_DIR means "Environment Directory" specified at the Agent installation.)
Solaris OS, Linux, HP-UX, AIX	/etc/opt/FJSVssage/snmpth

The file is read and used when Agent starts. Therefore, the restart of Agent is needed to operate according to the modified contents when the file is modified.

The file name is the enterprise code in a trap issued from Agent to Manager and in which "." is replaced with "_".

Table A.2 Default SNMP Trap XML definition files on a system where this software is implemented with Agent

Server node	File name (*1)	Monitoring target
Solaris OS	1_3_6_1_4_1_211_4_1_3_21_2_2.xml	Safe/PRIMECLUSTER GDS, GFS series
	1_3_6_1_4_1_211_4_1_3_21_2_21.xml	ETERNUS multipath driver
	1_3_6_1_4_1_211_4_1_3_21_2_22.xml	EMC PowerPath
	1_3_6_1_4_1_211_4_1_3_21_2_23.xml	HITACHI JP1/HiCommand Dynamic Link Manager
	1_3_6_1_4_1_211_4_1_3_21_2_24.xml	Sun MPxIO
Windows	1_3_6_1_4_1_211_4_1_3_21_2_5.xml	ETERNUS multipath driver
Linux	1_3_6_1_4_1_211_4_1_3_21_2_3.xml	ETERNUS multipath driver
	1_3_6_1_4_1_211_4_1_3_21_2_31.xml	PRIMECLUSTER GDS, GFS series
HP-UX	1_3_6_1_4_1_211_4_1_3_21_2_4.xml	PV-LINK (LVM function)
	1_3_6_1_4_1_211_4_1_3_21_2_41.xml	HBA driver
AIX	1_3_6_1_4_1_211_4_1_3_21_2_6.xml	MPIO

*1: When this file is updated, the file with the same name on the Manager side must also be updated so that their contents are the same.

Definition file format

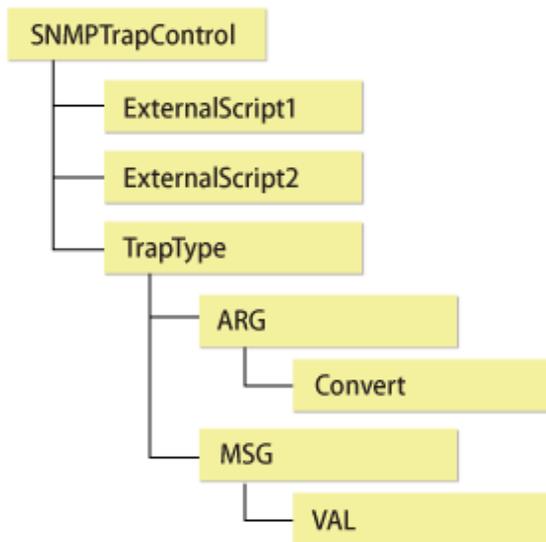
Definition contents

Operations are defined by the following items for the Specific Trap Type in the definition file:

Item	Description
Operation definition	Whether to post a status change to a window Whether to output the event log Whether to implement linkage with Systemwalker Centric Manager and linkage with Shell/Bat Whether to enable external script linkage 1 Whether to enable external script linkage 2
Fault level	Notification levels of individual events and linkage with Systemwalker Centric Manager (Information/Warning/Error)
Message	Message output for event and linkage with Systemwalker Centric Manager

Node hierarchy

The following figure shows the hierarchy of tag nodes:



Tags and attributes

SNMPTrapControl tag

Attribute name	Description
name	Device name
ver	Version of this definition file

ExternalScript1, ExternalScript2 tag (option)

This tag defines the script name when using external script linkage. ExternalScript1 indicates external script linkage 1 and ExternalScript2 indicates external script linkage 2. A script defined here is executed when the corresponding linkage bit is set on in the flag attribute of the TrapType tag or the Convert tag.

ExternalScript1 and ExternalScript2 tag must be defined in a line above the TrapType tag definition.

Attribute name	Description
name	Executed script name (using full path name)

TrapType tag

This tag defines trap analysis operations for each Specific Trap Type. Traps of types not defined by the TrapType tag are not analyzed and discarded.

Attribute name	Description
type	"ST" + Specific Trap Type number (decimal)
flag	<p>Control of event, linkage with Systemwalker Centric Manager, linkage with Script, and e-mail notification (in 7-bits binary)</p> <p>The "0" is interpreted as "off", the "1" is "on".</p> <p>bit6 ... e-mail notification of a information event (*1) bit5 ... external script linkage2 bit4 ... external script linkage1 bit3 ... Linkage with Systemwalker Centric Manager, Linkage with Shell/Bat (*2) bit2 ... Event log output bit1 ... (Cannot be changed) bit0 ... Status change notification</p> <p>For example, only linkage with Systemwalker Centric Manager is set to on flag="0001000".</p> <p>If you specify it only 4 bit length, the values of bit4, bit5, and bit6 are interpreted as "0". For example, flag="1111" is interpreted as flag="0001111".</p>
level	<p>Specify events and the levels that are posted to Systemwalker Centric Manager.</p> <p>(I: Information / W: Warning / E: Error)</p>
msg	<p>Messages displayed for events and linkage with Systemwalker Centric Manager, sending and linkage with Script.</p> <p>The following parameters can be included in messages:</p> <p>%d: Decimal number %x: Hexadecimal number %s: Character string</p> <p>As many ARG tags as the number of parameters included in a message must be defined as described in (4) below.</p> <p>If any character other than 'd', 'x', and 's' follows %, the % is handled as a character and displayed as is.</p>

*1: Set it to on if you want to enable the e-mail notification of an information event or disable the e-mail notification of a warning event and an error event.

*2: Since events of the Agent are not reported to Systemwalker Centric Manager, only Shell/Bat linkage control can be done in the definition file of the Agent.

ARG tag

The ARG tag defines correspondence between a parameter specified in the msg attributes of the TrapType tag and a Variable Binding index in trap data. There are as many ARG tags as the number of parameters specified in the msg attributes must be defined.

Attribute name	Description
index	Index number (0 or larger) of a parameter included in the msg attributes of the TrapType tag described in (3).
VBIndex	Index number (0 or larger) of Variable Binding in Trap data

Convert tag (option)

The Convert tag specifies how to express a character string for an INTEGER-type data value of a trap. Definition of this tag is optional. For example, to use Trap data value 0 to indicate the status of OK, specify <Convert val="0" name="OK"/> so that character string "OK" can be displayed instead of "0".

By specifying the flag attribute and level attribute (options), a fault level specified in the level attribute of the TrapType tag can be changed and posted. (If the msg attribute includes multiple ARGs and the flag or level attribute is specified in individual Convert tags, the values specified in the Convert tag of the last ARG are used.)

Attribute name	Description
val	Numeric data value (decimal) of the INTEGER type in a Trap
flag (option)	Control of events, linkage with Systemwalker Centric Manager, linkage with Script, and e-mail notification (in 7-bit binary) Refer to " TrapType tag ". for values
level (option)	Fault level "I", "W", or "E" This tag is given a higher priority than the TrapType tag.
name	Character string corresponding to val

If an undefined value is received, the value is displayed as a numeric value as is.

MSG tag

The MSG tag defines a monitoring keyword for Server Node Agent monitoring. It is valid only for Server Node Agent.

Windows Agent: Monitors with the id, src, and type attributes (ignores the key attribute).

Another Agent: Monitors with the key attribute (ignores the id, src, and type attributes).

Attribute name	Description
key	Monitoring keyword for monitoring (required for a non-Windows Agent)
id	Event ID of the event to be monitored (required for a Window Agent)
src	Source name of the event to be monitored (required for a Windows Agent)
line	When a VAL tag is used (a substring of a monitored event is added to notification information), specify the number of monitored event lines for the line attribute. The line attribute can be omitted for a single line or when a Windows Agent is used.
type	Specify the type of event logs to be monitored. (Valid only for windows Agent) System: Monitor the system log. (Default) Application: Monitor the application log.

To change the monitoring keyword, change this keyword.

A normal expression can be specified to the monitoring keyword.

To add a monitoring keyword for monitoring, add the TrapType tag and later shown below. Be sure not to specify a Specific Trap Type number that is already specified.

VAL tag (option)

The VAL tag is used to define the method of retrieving a character string from the monitored event and adding it to notification information. The VAL tag is valid only for Server Node Agent.

Attribute name	Description
ref	Specify the value to be added to notification information. Specify the value in parentheses () in normal expression.

ID attribute specification by DTD

During SNMP Trap control, the type attribute of the TrapType tag is used as the ID attribute for searches, so DTD must be described as follows in the XML definition file:

```
<!DOCTYPE SNMPTrapControl[  
<!ATTLIST TrapType type ID #REQUIRED>  

```

Definition file sample

```
<?xml version="1.0" encoding="UTF-8"?>  
<!DOCTYPE SNMPTrapControl  
<!ATTLIST TrapType type ID #REQUIRED>  
<SNMPTrapControl name="SW3800" ver="1.0">  
  <TrapType type="ST1" flag="111111" level="E" msg="Faulty reason: %d">  

```



Example

Method of suppressing ETERNUS SN200 series, Brocade series FC port Online/Offline traps:

To suppress ETERNUS SN200 series, Brocade series FC port Online/Offline traps, change the following locations in the corresponding XML definition file.

The flag attribute is changed to "000000" in val="1" and val="2" of the Convert tag in <ARG index="1" VBIndex="0"> for which "ST3" is specified as the type attribute.

```
<Convert val="1" flag="000000" level="I" swsag="4203" name="Online"/>  
<Convert val="2" flag="000000" level="I" swsag="4203" name="Offline"/>
```

A.7 Correlation.ini Parameter

This file is saved at the following location of the Server Node as a detailed setting file of Agent:

Platform of Agent	Location
Windows	\$ENV_DIR\ESC\Agent\etc\Correlation.ini (\$ENV_DIR means "Environment Directory" specified at the Agent installation.)
Solaris OS, Linux, HP-UX, AIX	/etc/opt/FJSVssage/Correlation.ini

Reflecting the contents of the setting file

The file is read and used when Agent starts.

To operate according to the contents of the file the restart of Agent is needed.

Customization

PollingTime

Specify a period of time in seconds during which system messages are monitored. The default value is 10.

0 (not monitored) to 3600 (one hour)

```
PollingTime=time
```

HBAStatus (HP-UX Agent does not support this parameter)

Specify this parameter to collect HBA's status. The default value is ON.

```
HBAStatus= ON or OFF
```

- ON (status of HBA is collected.)
- OFF (status of HBA is suppressed.)

To unite states of HBA in the environment where the Storage Cruiser's agent of Solaris OS and Windows exist together with SSC agent, turn HBAStatus to OFF.

HBAMask (HP-UX Agent does not support this parameter)

Use this parameter to make HBA port be non-displayed. Specify World Wide Port Name (WWPN) of HBA port non-displayed is specified. If multiple HBA ports are specified, specify as many parameters as the number of HBA ports.

```
HBAMask=WWPN-of-HBA-port
```

The Warning status is displayed for HBA port when FC cable is not connected with it. To suppress the status of HBA because of unused or similar reason, use this parameter.

If HBA displayed in the Web Console is specified, delete the relevant HBA in the Web Console. If not delete, the relevant HBA remains displayed in the Web Console.

A.8 Device Polling Setting File

Editing these setting files can customize the default behavior of the device polling function. Two setting files are provided: one file is for defining the polling function behavior and the other file is for defining event linkage control. These files are described in XML.

Reflecting the contents of the setting file

Changed contents are automatically reflected at the next polling operation. (Manager checks the file contents every 30 seconds even while polling is stopped.) Even if executing "Definition File Re-read" using the Web Console, be careful that the file may not be reflected.

Customization (Polling function behavior setting file)



Note

- If an error is detected in an XML file, the event message shown below is output for each polling operation. In this event, the polling function operates with the default settings.

Message: "[Polling] XML File Format Error(XML file name)"

- Be sure not to delete the file itself even if no items are set. If the file is deleted, re-create the file according to the above sample.
- When customizing the polling function behavior setting file, do not edit the setting file in the installation directory but edit the one in the customization directory.

Setting file name and storage directory

The polling function behavior setting file is stored in the following location during Manager installation or upgrading:

Platform of Manager	Location
Windows	\$INS_DIR\ESC\Manager\opt\FJSSmgr\lib\devicepolling\DP_config.xml (\$INS_DIR means "Program Directory" specified at the Manager installation.)
Solaris OS, Linux	/opt/FJSSmgr/lib/devicepolling/DP_config.xml

When customizing the polling function behavior, copy the polling function behavior setting file in the above location to the customization location shown below, and edit the copy of the file.

Platform of Manager	Customization Location
Windows	\$ENV_DIR\ESC\Manager\etc\opt\FJSSmgr\current\devicepolling\DP_config.xml (\$ENV_DIR means "Environment Directory" specified at the Manager installation.)
Solaris OS, Linux	/etc/opt/FJSSmgr/current/devicepolling/DP_config.xml

If the polling function behavior setting file exists in the customization location, Manager operates in accordance with the setting file. If not, it operates in accordance with the default setting file in the installation directory.

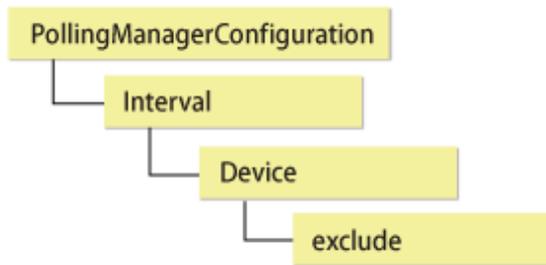
Setting file format

Setting contents

Item	Description
Polling interval	Polling operation interval (including during stoppage)
Device not subject to polling	Specify a device to exclude it from polling.

Node hierarchy

The tag node hierarchy is shown below.



Tags and attributes

Interval tag

Attribute name	Description
value	A polling operation interval is set in seconds (decimal). The minimum interval is 30 seconds. If a value less than 30 is specified, 30 seconds is used for polling. Specifying 0 stops polling.

Device/exclude tag

No attributes can be set in the Device tag. As many exclude tags as required can be set.

exclude tag

Attribute name	Description
address	Specify the IP address of a device to exclude it from polling operations. For IP address, IPv4 or IPv6 format can be specified.

Default value

The default values of the parameters are as follows:

Polling interval: 60 seconds

Device not subject to polling: None

Sample setting file

```

<?xml version="1.0" encoding="UTF-8" ?>
<PollingManagerConfiguration>
  <Interval value="60"/>
  <Device>
    <exclude address="10.20.30.40"/>
    <exclude address="10.20.30.50"/>
  </Device>
</PollingManagerConfiguration>
  
```

Customization (Control Event Linkage setting file)



Note

- The portions that can be changed are the name attribute values of the ExternalScript1 and ExternalScript2 tags and the flag attribute value of the Convert tag only. The other portions may not be modified since the changes can possibly cause an abnormal behavior of the polling function.
- Events involving the server node agent are not posted to Systemwalker Centric Manager. Use the monitoring function of Systemwalker Centric Manager to monitor operating status.

Setting file name and storage directory

The setting file is stored in the following directory:

Platform of Manager	Location
Windows	\$INS_DIR\ESC\Manager\opt\FJSVssmgr\lib\snmpth\1_3_6_1_4_1_211_4_1_3_21_1.xml (\$INS_DIR means "Program Directory" specified at the Manager installation.)
Solaris OS, Linux	/opt/FJSVssmgr/lib/snmpth/1_3_6_1_4_1_211_4_1_3_21_1.xml

Setting file format

Setting contents

Item	Description
External script name definition	Define the script name when using external script linkage.
Operation definition	Whether to display a posted status change Whether to output the event log Whether to implement linkage with Systemwalker Centric Manager and linkage with Shell/Bat Whether to implement external script linkage 1 Whether to implement external script linkage 2

Setting method

- External Script name definition

When using external script linkage, define the script name in the name attribute of following definition lines (in full path specification).

Item	Definition line
external script linkage 1	<ExternalScript1 name="c:\somedir\script1.bat" />
external script linkage 2	<ExternalScript2 name="c:\somedir\script2.bat" />

- Event linkage behavior definition

In the configuration file, there are following definition lines according to the events. To define Event linkage behavior, set in the flag attribute of each definition line.

Event	Definition line
When the status becomes normal	<Convert val="0" name="" level="I" flag="001111" />
When the status becomes warning	<Convert val="1" name="" level="W" flag="001111" />
When the status becomes error	<Convert val="2" name="" level="E" flag="001111" />
When the status becomes timeout	<Convert val="3" name="" level="WT" flag="001111" />
When communication has been recovered	<Convert val="10" name="" level="IR" flag="001111" />

Flag Attribute is shown below.

Attribute name	Description
flag	<p>Control of event, linkage with Systemwalker Centric Manager, and linkage with Script (in 6-bits in binary)</p> <p>The "0" is interpreted as "off", the "1" is "on".</p> <p>bit5 ... External script linkage 2 bit4 ... External script linkage 1 bit3 ... Linkage with Systemwalker Centric Manager, Linkage with Shell/Bat bit2 ... Event log output bit1 ... (Cannot be changed) bit0 ... Status change notification</p> <p>For example, only linkage with Systemwalker Centric Manager is set to on "001000".</p>

A.9 Polling Service Setting File

The default operation of the polling service can be customized by editing its XML configuration file.

Reflecting the file

If the setting file is changed, execute re-read definition file by using the Web Console, or reactivate the Manager. This reflects the settings on this software.

Customization



Note

- Do not delete the file, even if no items are specified.
- To customize the polling service, edit the file in the customization directory (not the one in the installation directory).

File path and name

When the Manager is installed or upgraded, the configuration file is stored in the directory below:

Manager OS	Absolute path name
Windows	\$INS_DIR\ESC\Manager\opt\FJSVssmgr\lib\polling\pollingService.xml, where \$INS_DIR is the "executable directory" specified during Manager installation.
Solaris OS, Linux	/opt/FJSVssmgr/lib/polling/pollingService.xml

To customize the polling service, copy the configuration file in the directory above to the customization directory below, then edit it:

Manager OS	Absolute path name (for customization)
Windows	\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\polling\pollingService.xml, where \$ENV_DIR is the "environment directory" specified during Manager installation.
Solaris OS, Linux	/etc/opt/FJSVssmgr/current/polling/pollingService.xml

If there is a configuration file in the customization directory, then the Manager uses it, otherwise it uses the default configuration file in the installation directory.

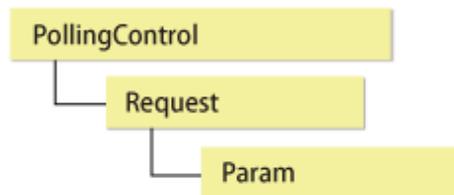
File format

Contents

Item	Content
Polling interval	Polling operation interval (including stopping).
Polling execution time specification	Polling execution time.

Node hierarchy

The tag node hierarchy for is displayed below:



Tags and attribute types

Request tag

Attribute name	Content
interval	<p>Polling interval in seconds (in decimal format).</p> <p>The minimum value is 30 - specifying shorter values will result in this value being used.</p> <p>The maximum value is 9223372036854775 - specifying larger values will result in this value being used.</p> <p>Note that values larger than 9223372036854775807 will cause an error.</p> <p>Specifying 0 will cause the polling service to not be executed.</p> <p>If both interval attribute and exectime attribute exist, interval attribute "interval" is given a higher priority than exectime attribute.</p>
exectime	<p>Polling execution time (in hh:mm:ss format - example: 21:15:00)</p> <p>hh has a valid range of 0 to 23, and mm and ss have a range of 0 to 59.</p> <p>If both interval attribute and exectime attribute exist, interval attribute "interval" is given a higher priority than exectime attribute.</p>

Param tag

None.

Default value

The default values of the parameters are as follows:

Polling interval: 3600 seconds

Polling execution time: 01:00:00

Sample configuration file

```
<?xml version="1.0" encoding="UTF-8" ?>
<PollingControl name="Default" ver="1.0">
  <Request name="WatchAlarm"
className="com.fujitsu.storagesoft.services.polling.method.WatchPoolAlarm" interval="3600">
  <param key="Warning" value="pool status changed: Warning" />
  <param key="Caution" value="pool status changed: Caution" />
```

```

    <param key="Normal" value="pool status changed: Normal" />
    <Request name="WatchCapacity"
className="com.fujitsu.storagesoft.services.polling.method.WatchPoolCapacity"
exectime="01:00:00" />
</PollingControl>

```

Example

Modification Method at intervals that observes threshold of Thin Provisioning Pool

Change the following part when you change the threshold watch interval of Thin Provisioning Pool.

The name attribute changes the interval attribute of the Request tag of "WatchAlarm". It specifies it at the second. Interval attribute is changed to "1800" when changing every 30 minutes.

```

<Request name="WatchAlarm"
className="com.fujitsu.storagesoft.services.polling.method.WatchPoolAlarm" interval="1800">

```

Example

Modification method at acquisition time of capacity information on Thin Provisioning Pool

Change the following part when you change acquisition time of capacity information on Thin Provisioning Pool.

The name attribute changes the exectime attribute of the Request tag of "WatchCapacity". The value is time (hh):(mm): It specifies it by second (ss). The exectime attribute is changed to "12:00:00" when changing at 12:00.

```

<Request name="WatchCapacity"
className="com.fujitsu.storagesoft.services.polling.method.WatchPoolCapacity" exectime="12:00:00" />

```

A.10 Explanation of the Configuration Settings File

The configuration file of devices targeted by the performance management function can be configured by editing the configuration settings file.

The following devices can be customized:

- Fibre Channel switches and Fibre Channel switch blades that support performance monitoring (except for the ETERNUS SN200 MDS series)

Reflecting the file

If the file has been changed, then either start performance monitoring of targeted devices, or reactivate the Manager. This will reflect the contents of the file to this product.

Customization

Note

To restore the contents, the configuration file must be updated. Refer to ["7.2.9 Updating configuration information"](#) for details.

File path and name

A separate configuration settings file must be created for each device for which you want to change the configuration file.

Manager OS	Absolute path name
Windows	\$ENV_DIR\ESC\Manager\etc\opt\FJSVssmgr\current\perfconf\IP address.xml where \$ENV_DIR is the "environment directory" specified during Manager installation.

Manager OS	Absolute path name
Solaris OS	/etc/opt/FJSVssmgr/current/perfconf/IP address.xml
Linux	

Specify the following for file name:

IP address set to device	File name
IPv4 address	"." in the IP address set to device is replaced with "_".
IPv6 address	":" in the IP address displayed in FC switch list is replaced with "_". Refer to "Display the FC switch list" in the <i>ETERNUS SF Web Console Guide</i> for the procedure to display FC switch list.

Example

If the IPv4 address is 10.20.30.40:

```
10_20_30_40.xml
```

If the IPv6 address displayed in FC switch list is 2001:0:0:1::1:

```
2001_0_0_1__1.xml
```

port-baud-rate-X

Specify the port number in the X part of the property name (port-baud-rate-X).

Specify a port transfer rate value between 0 and 25 (Unit: Gbps).

Note

- Performance monitoring and threshold value monitoring cannot be used if 0 is set as the transfer rate of the port.
- The graph display function cannot be used if 0 is set as the transfer rate of the port.
- When the performance values are displayed as a graph, 0 is displayed as the performance value for intervals in which 0 is set as the transfer rate.
- If the specified transfer rate is invalid range, then the following values are displayed:

Transfer rate	Explanation
Less than 0	0Gbps is set.
Greater than 25	25Gbps is set.

Example

Setting 8Gbps as the transfer rate for Ports 1 and 2

```
port-baud-rate-1=8
port-baud-rate-2=8
```

Point

The maximum transfer rate for the VE port of the Fibre Channel switch is set to the default of 1Gbps.

If the FCIP trunking function or the FCIP data compression function are enabled and a transfer quantity of 1Gbps or more occurs for the VE port, then you must change the VE port transfer rate.

Use the formula below to calculate the transfer rate:

```
Transfer rate = Compression ratio set for the VE port * Total bandwidth set for the VE port
```



Example

Method for calculating the transfer rate of VE ports

For the environment below:

- Compression ratio (4:1)
- Four FCIP circuits each with a bandwidth of 0.5Gbps set for the VE port

```
Transfer rate = Compression ratio (4:1) * Total bandwidth (0.5Gbps * 4 circuits)
              = 4 * (0.5 * 4)
              = 8(Gbps)
```

A.11 snmptrapd.conf Configuration File

In order for the Linux Manager to use SNMP traps for fault monitoring, customize snmptrapd.conf (the configuration file included in the OS standard net-snmp package).

Manager OS	Location
Linux	/etc/snmp/snmptrapd.conf
	/usr/share/snmp/snmptrapd.conf

Reflecting the file

If the file has been changed, then restart snmptrapd:

```
# /etc/init.d/snmptrapd stop
# /etc/init.d/snmptrapd start
```



Note

In an environment where a ServerView trap distributor program (SMAWtrpsv) is being used, follow the steps below to restart it:

```
# /etc/init.d/snmptrapd stop
# /etc/init.d/trpsrvd stop
# /etc/init.d/snmptrapd start
# /etc/init.d/trpsrvd start
```

Customization

disableAuthorization

Set as shown below if you want to disable access control.

If not set, access control is enabled.

```
disableAuthorization yes
```

Note

- Check both `/etc/snmp/snmptrapd.conf` and `/usr/share/snmp/snmptrapd.conf`.
- If there are no requests from other products, then disable access control by setting this parameter to "yes".

authCommunity

This parameter can be customized if access control is enabled.

The format is displayed below:

```
authCommunity TYPES COMMUNITY [SOURCE [OID | -v VIEW ]]  
  
TYPES: log, execute, net  
COMMUNITY: Community name of monitoring target SNMP trap
```

TYPES can be set to log, execute, or net. COMMUNITY must be set to the SNMP trap community name of the monitoring target device. Do not set SOURCE, OID, or VIEW.

Set as shown below.

```
Example:  
authCommunity net public  
authCommunity net SANMA
```

If a device with an SNMP trap community name other than "public" or "SANMA" is to be monitored, add an authCommunity entry. For example, if the device to be monitored has the community name "common", set this parameter as below. Note that the "public" and "SANMA" entries are mandatory.

```
Example:  
authCommunity net public  
authCommunity net SANMA  
authCommunity net common
```

If authCommunity log or authCommunity execute has already been set by another product, in the TYPES field, then add "net", preceded by a comma. For example, set as shown below if authCommunity execute public is already set:

```
Example:  
authCommunity execute,net public
```

Note

Check `/etc/snmp` and `/usr/share/snmp`, and edit `snmptrapd.conf` in the file that already has authCommunity set by another product. If there is no setting in either file, then edit `/etc/snmp/snmptrapd.conf`.

forward

Make sure that the following is set in `/etc/snmp/snmptrapd.conf`:

```
forward default unix:/var/opt/FJSVssmgr/trap_socket
```

Examples

If access control is disabled

```
disableAuthorization yes  
forward default unix:/var/opt/FJSVssmgr/trap_socket
```

If access control is enabled

```
authCommunity net public
authCommunity net SANMA
forward default unix:/var/opt/FJSVssmgr/trap_socket
```

Monitoring a device that has the SNMP trap community name "common"

```
authCommunity net public
authCommunity net SANMA
authCommunity net common
forward default unix:/var/opt/FJSVssmgr/trap_socket
```

If authCommunity execute public has already been set

```
authCommunity execute,net public
authCommunity net SANMA
forward default unix:/var/opt/FJSVssmgr/trap_socket
```



Note

After snmptrapd.conf is customized, if an application (such as ServerView AlarmService) that uses snmptrapd is installed or uninstalled, or if settings are changed, then make sure that the customized contents of snmptrapd.conf have not been changed.

Appendix B Troubleshooting

This appendix explains the most common problems that might be encountered during ETERNUS SF Storage Cruiser operation. Further, it explains basic troubleshooting and also provides information on where to find further help.

B.1 Troubleshooting information

If a failure occurs in this software, the following troubleshooting information will be required:

Information for initial investigation

It is the information required for the initial analysis of problems.

The size of data should be small so that it can easily be sent by email.

Collect troubleshooting information immediately when a problem occurs. Sometimes, important information is lost over time.

Information for further investigation

The information for initial investigation can sometimes determine the cause of problems. However, some problems might require further, detailed troubleshooting information. Therefore, in case the cause of a problem cannot be determined from an initial investigation alone, it is required to collect more detailed information.

Collect information for further investigation and submit it to Fujitsu technical staff if requested.



- Sometimes, important information is lost over time. Collect troubleshooting information immediately when a problem occurs.
- When using the following to store the collected information, check if there is enough space in the filesystem to ensure system resources are not depleted or any effect is had on system operation.

Platform	Filesystem which attention is necessary for use
Windows	filesystem configured in the environment variable TEMP
Solaris OS, Linux, HP-UX, AIX	"/", "/var", and "/tmp"

Also, be careful about space when a different directory is specified with the command option. Ensure there is sufficient space in the directory.

- As a material for investigation, the information will reach 200KB - 5 MB (the maximum size is 30MB with "-all" option). Also, it is necessary to reserve 5 - 30MB (30 - 80 MB with the "-all" option) for a temporary directory to store the information. The space required varies depending on operating environment, and the data described above is for reference.

B.2 Information for initial investigation

When a system failure occurs, determine and analyze the cause of the problem as soon as possible.

This section explains information required for initial investigation.

Advantage

The information used for initial problem analysis can be acquired immediately, and is small enough to be sent by email.

B.2.1 Collecting information from the Management Server (Solaris OS)

Export the initial investigation information by using the Web Console.

If the export fails or the Web Console cannot be used, collect the information as follows. Submit the information to the Fujitsu technical staff.

Point

In cluster configurations, collect information on both the primary and secondary nodes of the Management Server.

1. Make a note of the error code (swsagXXXX), if an error dialog box is displayed.

2. Login to the server where you perform the operation.

Perform the operation with OS administrator permissions (root) after login.

3. Execute the esfsnap command.

```
# /opt/FJSVesfcm/bin/esfsnap -dir directory
```

Specify the directory to save the information with -dir option (The -dir option cannot be omitted).

B.2.2 Collecting information from the Management Server (Linux)

Export the initial investigation information by using the Web Console.

If the export fails or the Web Console cannot be used, collect the information as follows. Submit the information to the Fujitsu technical staff.

Point

In cluster configurations, collect information on both the primary and secondary nodes of the Management Server.

1. Make a note of the error code (swsagXXXX), if an error dialog box is displayed.

2. Login to the Management Server with OS administrator permissions (root).

OS administrator permissions are required to collect the information.

3. Execute the esfsnap command.

```
# /opt/FJSVesfcm/bin/esfsnap -dir directory
```

Specify the directory to save the information with -dir option (The -dir option cannot be omitted).

B.2.3 Collecting information from the Management Server (Windows)

Export the initial investigation information by using the Web Console.

If the export fails or the Web Console cannot be used, collect the information as follows. Submit the information to the Fujitsu technical staff.

1. Make a note of the error code (swsagXXXX), if an error dialog box is displayed.

2. Login to the Management Server with the user of an Administrators group.

OS administrator permissions are required to collect the information.

3. Execute the esfsnap command. The \$INS_DIR means "Program Directory" specified at the Manager installation.

```
C:\> $INS_DIR\Common\bin\esfsnap -dir directory
```

Specify the directory to save the information with `-dir` option (The `-dir` option cannot be omitted).

B.2.4 Collecting information on the Managed Server node (Solaris OS)

The method for collecting information is as follows. Submit the information to the Fujitsu technical staff.

1. Login to the server where you perform the operation.

Perform the operation with OS administrator permissions (root) after login.

2. Execute the `agentsnap` command.

```
# /opt/FJSVssage/sys/agentsnap [-dir directory]
```

It is possible to change a directory to save the information by specifying `-dir` option. If the option is omitted, information will be saved in `/tmp`.

B.2.5 Collecting information on the Managed Server node (Windows)

The method for collecting information is as follows. Submit the information to the Fujitsu technical staff.

1. Login to the server node with the user of an Administrators group.

OS administrator permissions are required to collect the information.

2. Execute the `agentsnap` command. The `$INS_DIR` means "Program Directory" specified at the Agent installation.

```
C:\> $INS_DIR\ESC\Agent\sbin\agentsnap -dir directory
```

Specify the directory to save the information with `-dir` option (The `-dir` option cannot be omitted).

3. Collect event log of Windows by Event Viewer which is a standard application of Windows.

Run "Event Viewer", select [Action] - [Save Log File As], and save the following event log files.

- System files
- Application files

B.2.6 Collecting information on the Managed Server node (Linux)

The method for collecting information is as follows. Submit the information to the Fujitsu technical staff.

1. Login to the server node with OS administrator permissions (root).

OS administrator permissions are required to collect the information.

2. Execute the `agentsnap` command.

```
# /opt/FJSVssage/sys/agentsnap [-dir directory]
```

It is possible to change a directory to save the information by specifying `-dir` option. If the option is omitted, information will be saved in `/tmp`.

B.2.7 Collecting information on the Managed Server node (HP-UX)

The method for collecting information is as follows. Submit the information to the Fujitsu technical staff.

Collect information directly by `cp` command.

1. Collect system log files.
Collect all files from the directory below.
 - /var/adm/syslog/syslog.log
 - /var/adm/syslog/OLDsyslog.log (If exists)
2. Collect trace log files.
Collect all files from /var/opt/FJSVssage directory. (including sub-directories)
3. Collecting setting files.
Collect all files from /etc/opt/FJSVssage directory. (including sub-directories)
4. Collect core file, if it exists on the root directory "/".

B.2.8 Collecting information on the Managed Server node (AIX)

The method for collecting information is as follows. Submit the information to the Fujitsu technical staff.

Collect information directly by cp command.

1. Collect trace log files.
Collect all files from /var/opt/FJSVssage directory. (including sub-directories)
2. Collecting setting files.
Collect all files from /etc/opt/FJSVssage directory. (including sub-directories)
3. Collect core file, if it exists on the root directory "/".
4. Collect the files specified as a error log file.
Example: /var/adm/ras/errlog
5. Collect syslog files when you make settings so that syslog messages are displayed.

B.3 Information for further investigation

If it is not possible to determine the cause of the problem in the initial investigation, further detailed information may be needed.

This section explains how to collect required information to resolve the problem.

Data feature

As there is various information required in order to determine the cause of the problem, the size of the data will be greater than that used for the initial investigation.

B.3.1 Collecting information from the Management Server (Solaris OS)

Export the initial investigation information by using the Web Console.

If the export fails or the Web Console cannot be used, collect the information as follows. Submit the information to the Fujitsu technical staff.



Point

.....
 In cluster configurations, collect information on both the primary and secondary nodes of the Management Server.

1. Login to the server where you perform the operation.

Perform the operation with OS administrator permissions (root) after login.

2. Execute the fjsnap command or esfsnap command.

Usually, use the fjsnap command. If fjsnap command cannot be executed for some reason, use the esfsnap command.

- fjsnap command

```
# /opt/FJSVsnap/bin/fjsnap -a output
```

Replace the variable *output* with the name of the output medium or specific file name to save the collected information.

- esfsnap command

```
# /opt/FJSVesfcm/bin/esfsnap -dir directory -all
```

Specify the directory to save the information with -dir option (The -dir option cannot be omitted).

B.3.2 Collecting information from the Management Server (Linux)

Export the initial investigation information by using the Web Console.

If the export fails or the Web Console cannot be used, collect the information as follows. Submit the information to the Fujitsu technical staff.

Point

.....
In cluster configurations, collect information on both the primary and secondary nodes of the Management Server.
.....

1. Login to the Management Server with OS administrator permissions (root).

OS administrator permissions are required to collect the information.

2. Execute the fjsnap command and esfsnap command.

Execute both commands. If the fjsnap command cannot be executed for some reason, use only the esfsnap command.

- fjsnap command

```
# /opt/FJSVsnap/bin/fjsnap -a output
```

Replace the variable *output* with the name of the output medium or specific file name to save the collected information.

- esfsnap command

```
# /opt/FJSVesfcm/bin/esfsnap -dir directory -all
```

Specify the directory to save the information with -dir option (The -dir option cannot be omitted).

B.3.3 Collecting information from the Management Server (Windows)

Export the initial investigation information by using the Web Console.

If the export fails or the Web Console cannot be used, collect the information as follows. Submit the information to the Fujitsu technical staff.

1. Login to the Management Server with the user of an Administrators group.

OS administrator permissions are required to collect the information.

2. Execute the esfsnap command. The \$INS_DIR means "Program Directory" specified at the Manager installation.

```
C:\> $INS_DIR\Common\bin\esfsnap -dir directory -all
```

Specify the directory to save the information with `-dir` option (The `-dir` option cannot be omitted).

B.3.4 Collecting information on the Managed Server node (Solaris OS)

The method for collecting information is as follows. Submit the information to the Fujitsu technical staff.

1. Login to the server where you perform the operation.

Perform the operation with OS administrator permissions (root) after login.

2. Execute the `agentsnap` command.

```
# /opt/FJSVssage/sys/agentsnap [-dir directory] -all
```

It is possible to change a directory to save the information by specifying `-dir` option. If the option is omitted, information will be saved in `/tmp`.

B.3.5 Collecting information on the Managed Server node (Windows)

The method for collecting information is as follows. Submit the information to the Fujitsu technical staff.

1. Login to the server node with the user of an Administrators group.

OS administrator permissions are required to collect the information.

2. Execute the `agentsnap` command. The `$INS_DIR` means "Program Directory" specified at the Agent installation.

```
C:\> $INS_DIR\ESC\Agent\sbin\agentsnap -dir directory -all
```

Specify the directory to save the information with `-dir` option (The `-dir` option cannot be omitted).

B.3.6 Collecting information on the Managed Server node (Linux)

The method for collecting information is as follows. Submit the information to the Fujitsu technical staff.

1. Login to the server node with OS administrator permissions (root).

OS administrator permissions are required to collect the information.

2. Execute the `agentsnap` command.

```
# /opt/FJSVssage/sys/agentsnap [-dir directory] -all
```

It is possible to change a directory to save the information by specifying `-dir` option. If the option is omitted, information will be saved in `/tmp`.

B.3.7 Collecting information on the Managed Server node (HP-UX)

Collect the information which is required by Fujitsu technical staff, and submit the file to them.

B.3.8 Collecting information on the Managed Server node (AIX)

Collect the information which is required by Fujitsu technical staff, and submit the file to them.

Appendix C How to check product version

This appendix describes how to check version of installed ETERNUS SF Storage Cruiser.

Point

- ETERNUS SF Storage Cruiser can be operated even if a different version of the agent and manager. Therefore, ETERNUS SF Storage Cruiser to determine the exact use of the environment, you must determine the version of each component..
- How to check version is different for each platform. ETERNUS SF Storage Cruiser check from the platform of the system components are installed, read how to determine the appropriate platform.

C.1 To check the product version in Windows operating system

Check the product version according to the procedure shown below.

1. Logon to Windows operating system, ETERNUS SF Storage Cruiser component is installed.
2. Open the window that can add or remove programs.
 - For Windows Server 2003
From the Control Panel, open the [Add or Remove Programs] screen.
 - For Windows Server 2008 or later
From the Control Panel, open the [Programs and Features] screen.
3. Select ETERNUS SF Storage Cruiser component on "Add or Remove Programs" window.
The following is ETERNUS SF Storage Cruiser component and program name.

Component name	Program name
Manager	ETERNUS SF Manager
Agent	ETERNUS SF Storage Cruiser Agent

4. A screen is displayed to confirm the version information.
 - For Windows Server 2003
Click "Click here for support information." in step 3.
 - For Windows Server 2008 or later
Continue with step 5.
5. Confirm the version information.
 - For Windows Server 2003
Confirm the version information in "Support information" dialog.
 - For Windows Server 2008 or later
Confirm the version information, displayed in the [Programs and Features] screen.

C.2 To check the product version in Solaris OS

Check the product version according to the procedure shown below.

1. Logon to Solaris OS, ETERNUS SF Storage Cruiser component is installed.
root (superuser) privileges are not required.
2. Perform the check version according to the command shown below.
 - To check Manager version


```
# pkginfo -l FJSVssmge
```
 - To check agent version


```
# pkginfo -l FJSVssage
```
3. pkginfo command output that results from, VERSION verify information.
ETERNUS SF Storage Cruiser VERSION component information, 15.x.y format (x and y are numbers) will be output. Of these, 15.x is part of the specified components and versions.

C.3 To check the product version in Linux or VMware

Check the product version according to the procedure shown below.

1. Logon to Linux or VMware, ETERNUS SF Storage Cruiser component is installed.
root (superuser) privileges are not required.
2. Perform the check version according to the command shown below.
 - To check Manager version


```
# rpm -qi FJSVssmge
```
 - To check agent version


```
# rpm -qi FJSVssage
```
3. rpm command output that results from, VERSION verify information.
ETERNUS SF Storage Cruiser VERSION component information, 15.x.y format (x and y are numbers) will be output. Of these, 15.x is part of the specified components and versions.

Information

.....
Depending on your version of the product, Version 14.0.0_40I32 may be output and so on. However, if you please 14.x version is part of the decision.
.....

C.4 To check the product version in HP-UX

Check the product version according to the procedure shown below.

In addition, HP-UX running on ETERNUS SF Storage Cruiser is the only component of the agent and explained to the agent.

1. Logon to HP-UX, ETERNUS SF Storage Cruiser component is installed.
root (superuser) privileges are not required.
2. Perform the check version according to the command shown below.


```
# /usr/sbin/swlist | grep FJSVssage
```

3. The result of command execution, output is as follows.

```
# /usr/sbin/swlist | grep FJSVssage
FJSVssage      13.3.0      ETERNUS SF Storage Cruiser Agent
#
```

Version information is output in the second column. Please specify the version in the table below.

OS Type	The second column string (n is any number)	Agent version
HP-UX 11.0 HP-UX 11i	13.0.n	Latest (*1)
HP-UX 11i v2	13.0.n	13.1
	13.2.n	13.2
	13.3.n	13.3
	13.4.n	Latest (*1)
HP-UX 11i v3	13.4.n	Latest (*1)

*1: This is the latest version. Please determine the version of the manager and the same version.

C.5 To check the product version in AIX

Check the product version according to the procedure shown below.

In addition, AIX running on ETERNUS SF Storage Cruiser is the only component of the agent and explained to the agent.

1. Logon to AIX, ETERNUS SF Storage Cruiser component is installed.
root (superuser) privileges are not required.
2. Perform the check version according to the command shown below.

```
# /usr/bin/cat /etc/opt/FJSVssage/version.dat
```

3. The result of command execution, output is as follows.

```
# /usr/bin/cat /etc/opt/FJSVssage/version.dat
version=15.1.0
#
```

Version information is output in the form of "x.y.z" (x, y, and z are digit).

Appendix D Migrating from the Previous Version

This appendix describes the tool used to upgrade Storage Cruiser.

Point

- "Version Upgrade" refers to migration from Storage Cruiser Version 13.x/14.x/15.x to Storage Cruiser Version 15.3.
- To perform the version upgrade, back up the old versions of the files, then restore them in the new environment. Use the special-purpose tool to backup and restore the device management information.

D.1 Version Upgrade Tool

The version upgrade tool is stored under the following directory on the DVD-ROM "ETERNUS SF SC/ACM/Express Mediapack (Manager Program) (1/2)" for this version:

```
DVD-ROM drive\Manager_windows\ESC\escvup directory
+ escvup.exe
```

The self-extraction program escvup.exe extracts the following files and folders when executed under Windows:

```
escvup directory
+ unxvup.tar (tool for Solaris OS and Linux)
+ winvup.exe(tool for Windows)
```

Copy the tool to the work directory of the server being upgraded (ESC Manager installation directory), and delete it once the version upgrade is complete.

D.2 Solaris OS and Linux

Preparation

1. Copy unxvup.tar to the work directory.

In this section, we assume the work directory to be /var/tmp/escvup.

2. Move to the work directory and expand unxvup.tar.

```
# cd /var/tmp/escvup
# tar xvf unxvup.tar
```

The files below will be expanded in the work directory:

- cimbackup.sh
- cimrestore.sh
- dbkit.jar

cimbackup.sh is backup command and cimrestore.sh is restore command (dbkit.jar is invoked by cimbackup.sh and cimrestore.sh).

The backup and restore commands should be issued in the work directory, and require root permission for execution.

Backing up device management information

Execute cimbackup.sh, specifying the backup location.

```
# ./cimbackup.sh <backup_location>
```

The message below is displayed upon successful execution:

```
INFO: cimbackup has been completed.
```

The table below lists the possible error messages:

Error	Message
Backup location was not specified	Usage: cimbackup.sh save-directory
ESC Manager is currently operating	WARNING: Unable to backup, while the ETERNUS SF Storage Cruiser Manager is running.
ESC Manager is not installed	WARNING: The old ETERNUS SF Storage Cruiser Manager is not installed.
Files targeted for backup already exist at the specified backup location	WARNING: The backup files are found in <i><directory></i> .
Directory does not exist at the specified backup location	ERROR: The specified directory <i><directory></i> is not found.
File copying failed	ERROR: Unable to copy <i><file></i> to <i><directory></i> .
Files targeted for backup do not exist	ERROR: Unable to find <i><file></i> .
Directory creation failed	ERROR: Unable to create the directory <i><directory></i> .
Backup failed	ERROR: cimbackup has been failed.

Restoring device management information

Execute cimrestore.sh, specifying the backup location.

```
# ./cimrestore.sh <backup_location>
```

The message below is displayed upon successful execution:

```
INFO: cimrestore has been completed.
```

The table below lists the possible error messages:

Error	Message
Backup location was not specified	Usage: cimrestore.sh save-directory
ESC Manager is currently operating	WARNING: Unable to restore, while the ETERNUS SF Storage Cruiser Manager is running.
ESC Manager is not installed	WARNING: The ETERNUS SF Storage Cruiser Manager is not installed.
Backed up files could not be found in the specified backup location	ERROR: The backup files are not found in <i><directory></i> .
Database conversion failed	ERROR: Unable to convert the Repository <i><directory></i> .
Database initialization failed	ERROR: Unable to initialize the Repository <i><directory></i> .
Database reconstruction failed	ERROR: Unable to reconstruct the Repository <i><directory></i> .
Restoration failed	ERROR: cimrestore has been failed.

D.3 Windows

Preparation

1. Copy winvup.exe to the work directory.

In this section, we assume the work directory to be D:/tmp/escvup.

2. Move to the work directory and execute winvup.exe from the work directory.

```
C:\Document and Settings\Administrator> cd /d D:\tmp\escvup
D:\tmp\escvup> winvup.exe
```

The files below will be expanded in the work directory:

- cimbackup.bat
- cimrestore.bat
- dbkit.jar
- sscreg.exe

cimbackup.bat is backup command and cimrestore.bat is restore command (dbkit.jar and sscreg.exe are invoked by cimbackup.sh and cimrestore.sh).

The backup and restore commands should be issued in the work folder, by a user with Administrator privileges.

Backing up device management information

Execute cimbackup.bat, specifying the backup location.

```
D:\tmp\escvup> cimbackup.bat <backup_location>
```

The message below is displayed upon successful execution:

```
INFO: cimbackup has been completed.
```

The table below lists the possible error messages:

Error	Message
Backup location was not specified	Usage: cimbackup.bat save-directory
If ESC Manager is currently operating	WARNING: Unable to backup, while the ETERNUS SF Storage Cruiser Manager is running.
ESC Manager is not installed	WARNING: The old ETERNUS SF Storage Cruiser Manager is not installed.
The files targeted for backup already exist at the specified backup location	WARNING: The backup files are found in <directory>.
The directory does not exist at the specified backup location	ERROR: The specified directory <directory> is not found.
File copying failed	ERROR: Unable to copy <file> to <directory>.
Files targeted for backup do not exist	ERROR: Unable to find <file>.
Directory creation failed	ERROR: Unable to create the directory <directory>.
Backup failed	ERROR: cimbackup has been failed.

Restoring device management information

Execute cimrestore.bat, specifying the backup location.

```
D:\tmp\escvup> cimrestore.bat <backup_location>
```

The message below is displayed upon successful execution:

```
INFO: cimrestore has been completed.
```

The table below lists the possible error messages:

Error	Message
Backup location was not specified	Usage: cimrestore.bat save-directory
ESC Manager is currently operating	WARNING: Unable to restore, while the ETERNUS SF Storage Cruiser Manager is running.
ESC Manager is not installed	WARNING: The ETERNUS SF Storage Cruiser Manager is not installed.
Backed up files cannot be found in the specified backup location	ERROR: The backup files are not found in <directory>.
Database conversion failed	ERROR: Unable to convert the Repository <directory>.
Database initialization failed	ERROR: Unable to initialize the Repository <directory>.
Database reconstruction failed	ERROR: Unable to reconstruct the Repository <directory>.
Restoration failed	ERROR: cimrestore has been failed.