

ETERNUS SF

Express V15.0/

Storage Cruiser V15.0/

AdvancedCopy Manager V15.0

Installation and Setup Guide

Preface

Purpose

This manual provides information on installation and setup of the following Storage Management Software ETERNUS SF products (hereafter abbreviated as "ETERNUS SF series") on storage systems.

- ETERNUS SF Express (hereafter abbreviated as "Express")
- ETERNUS SF Storage Cruiser (hereafter abbreviated as "Storage Cruiser")
- ETERNUS SF AdvancedCopy Manager (hereafter abbreviated as "AdvancedCopy Manager")

Intended Readers

This manual is intended for users of the three ETERNUS SF series products stated above.

Before you read this manual, you should be sure to have a sufficient general knowledge and understanding of clustered systems and server virtualization.

For information on upgrading from a previous version level to this version, refer to the "ETERNUS SF Migration Guide".

Organization

This manual is composed as follows:

[Chapter 1 Product Structure and Programs](#)

This chapter explains how ETERNUS SF series products are organized and various types of installation.

[Chapter 2 Operating Environment](#)

This chapter explains operating systems, hardware devices etc. that are supported by the ETERNUS SF series.

[Chapter 3 Installation of ETERNUS SF Manager](#)

This chapter explains the procedures for installing the ETERNUS SF Manager.

[Chapter 4 Setup of ETERNUS SF Manager](#)

This chapter explains how to set up the ETERNUS SF Manager.

[Chapter 5 Installation of ETERNUS SF Agent](#)

This chapter explains installation of Storage Cruiser's agent and AdvancedCopy Manager's agent.

[Chapter 6 Setup of ETERNUS SF Agent](#)

This chapter explains how to set up Storage Cruiser's agent and AdvancedCopy Manager's agent.

[Chapter 7 Installation of AdvancedCopy Manager CCM](#)

This chapter explains installation of the AdvancedCopy Manager CCM.

[Chapter 8 Setup of AdvancedCopy Manager CCM](#)

This chapter explains how to set up the AdvancedCopy Manager CCM.

[Chapter 9 Uninstallation of ETERNUS SF Manager](#)

This chapter explains the procedures for uninstalling of the ETERNUS SF Manager.

[Chapter 10 Uninstallation of ETERNUS SF Agent](#)

This chapter explains uninstallation of Storage Cruiser's agent and AdvancedCopy Manager's agent.

[Chapter 11 Uninstallation of AdvancedCopy Manager CCM](#)

This chapter explains uninstallation of the AdvancedCopy Manager CCM.

Chapter 12 Adding and Changing Products in Use

This chapter explains how to add and change products that are to be used or in use.

Appendix A Program components

This appendix explains the program components.

Appendix B License Management

This appendix explains license management function.

Appendix C Required Disk Space for Performance Management

This appendix explains the disk capacities that are required for performing the performance management with ETERNUS SF Manager.

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(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	
Solaris(TM) 9 Operating System	Solaris 9	Solaris or Solaris OS
Oracle Solaris 10	Solaris 10	

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)	-	
HP-UX 11.0 HP-UX 11i HP-UX 11i v2 HP-UX 11i v3	HP-UX	
AIX 5L V5.1 AIX 5L V5.2 AIX 5L V5.3	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 DX series	ETERNUS Disk storage system
ETERNUS DX60/DX60 S2 ETERNUS DX80/DX80 S2 ETERNUS DX90/DX90 S2	-			
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		
ETERNUS DX8100 S2 ETERNUS DX8700 S2	ETERNUS DX8000 S2 series			

Formal name	Abbreviation	
ETERNUS2000 ETERNUS4000 ETERNUS8000	-	
Web GUI of ETERNUS DX series	ETERNUS Web GUI	
ETERNUSmgr		

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 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
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, "ETERNUS4000" does not include ETERNUS4000 models 80 and 100.
- In this manual, "ETERNUS CS800" includes ETERNUS CS800 S2/CS800 S3.

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Notes

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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 (NOTE)			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
	Overview	No	No	Yes	This manual is unique for each product.
During installation	Installation and Setup Guide	Yes			This manual is common for all products.
	Cluster Environment Setup Guide	No	Yes		This manual is common for Storage Cruiser and AdvancedCopy Manager.
	Migration Guide	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) - AdvancedCopy Manager Operation Guide (for HP-UX) - AdvancedCopy Manager Operation Guide (for AIX)
	Operation Guide for Copy Control Module	Yes	No	Yes	This manual is common for Express and AdvancedCopy Manager.
	Web Console Guide	Yes			This manual is common for all products.
Anytime	Event Guide	Yes		No	This manual is common for Express and Storage Cruiser.
	Messages	Yes			This manual is common for all products.
	Glossary	Yes			This manual is common for all products.

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

How to read manuals

Please 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 (NOTE)	Manual	Main contents	How to read
Acquiring a product overview and basic operation knowledge	EXP	- Express Quick Reference	- Product overview	Please read if you want to acquire a fundamental knowledge of the product and its operation in order
	SC	- Storage Cruiser Quick Reference	- Installation decision	

Purpose	Related products (NOTE)	Manual	Main contents	How to read
	ACM	- AdvancedCopy Manager Quick Reference	- Overview of the necessary tasks from installation to first use	to decide to install it or not.
		- AdvancedCopy Manager Overview	- Main functions - Cooperation with application - Procedure overview for Advanced Copy of ETERNUS Disk storage system	
Deciding if a version upgrade is required	common	- ETERNUS SF Migration Guide	- Incompatibilities with previous version - Notes and cautions about version upgrade - Version upgrade procedure	Please read if you want to upgrade from a previous version.
Installing and correctly operating the product Setting up operating environment depending on purpose	common	- ETERNUS SF Installation and Setup Guide	- Operating environment - Installation procedure - Setup procedure - Uninstallation procedure	Please read if you want to install and setup the product.
	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	Please read if you want to install and setup the product on 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	Please 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	

Purpose	Related products (NOTE)	Manual	Main contents	How to read
		- 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 - Data backup/restore inside the storage system	
	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) - AdvancedCopy Manager Operation Guide (for AIX)	- Necessary tasks after an architectural modification of the system as well as product maintenance - Command reference	
	common	- ETERNUS SF Web Console Guide	- Operating environment - Screen layout description	Please 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	Please 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	Please 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	Please read if you want to learn the meaning of important terms, product specific terms or abbreviations used in the manuals.

Purpose	Related products (NOTE)	Manual	Main contents	How to read
			- Proper form of abbreviated terms	

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

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Chapter 1 Product Structure and Programs

This chapter explains how the product is organized and various installation patterns.

1.1 Product structure

This section explains the product structure.

1.1.1 Software structure

The product includes the following programs and manuals:

- ETERNUS SF Express
- ETERNUS SF Storage Cruiser
- ETERNUS SF AdvancedCopy Manager

1.1.2 DVD-ROM contents

The product consists of two DVD-ROM disks.

For Windows

No.	DVD-ROM name	Contained contents
1	ETERNUS SF SC/ACM/Express V15.0 Mediapack for Windows Manager Program	<ul style="list-style-type: none">- ETERNUS SF Manager program- Software Release Guide
2	ETERNUS SF SC/ACM/Express V15.0 Mediapack for Windows Agent Program & Manual	<ul style="list-style-type: none">- ETERNUS SF Agent program- Software Release Guide- Online Manuals

For Linux 32-bit

No.	DVD-ROM name	Contained contents
1	ETERNUS SF SC/ACM/Express V15.0 Mediapack for Linux Manager Program	<ul style="list-style-type: none">- ETERNUS SF Manager program- Software Release Guide
2	ETERNUS SF SC/ACM/Express V15.0 Mediapack for Linux Agent Program & Manual	<ul style="list-style-type: none">- ETERNUS SF Agent program- Software Release Guide- Online Manuals

For Linux 64-bit

No.	DVD-ROM name	Contained contents
1	ETERNUS SF SC/ACM/Express V15.0 Mediapack for Linux 64bit Manager Program	<ul style="list-style-type: none">- ETERNUS SF Manager program- Software Release Guide

No.	DVD-ROM name	Contained contents
2	ETERNUS SF SC/ACM/Express V15.0 Mediapack for Linux 64bit Agent Program & Manual	<ul style="list-style-type: none"> - ETERNUS SF Agent program - Software Release Guide - Online Manuals

For Solaris

No.	DVD-ROM name	Contained contents
1	ETERNUS SF SC/ACM V15.0 Mediapack for Solaris Manager Program	<ul style="list-style-type: none"> - ETERNUS SF Manager program - Software Release Guide
2	ETERNUS SF SC/ACM V15.0 Mediapack for Solaris Agent Program & Manual	<ul style="list-style-type: none"> - ETERNUS SF Agent program - Software Release Guide - Online Manuals

1.2 Determining the installation programs

The table below shows the relationships between products to be used and programs to be installed. Please refer to this chart to determine which programs need to be installed.

Table 1.1 Relationships between products to be used and programs to be installed

Product to be used	Program to be installed	Description
Express	ETERNUS SF Manager	Installation is required.
Storage Cruiser	ETERNUS SF Manager	If not installed, installation is required. If installed, register the license. For more information, refer to " Chapter 12 Adding and Changing Products in Use ".
	Storage Cruiser's agent	To be installed only on Managed Servers on which you want to use functions that are available with Storage Cruiser's agent, e.g. access path setup, status monitoring or failure monitoring.
AdvancedCopy Manager (for Agent-based operation)	ETERNUS SF Manager	If not installed, installation is required. If installed, register the license. For more information, refer to " Chapter 12 Adding and Changing Products in Use ".
	AdvancedCopy Manager's agent	Installation is required. To be installed on servers that have backup or replication resources.
AdvancedCopy Manager (for Agent-less operation)	ETERNUS SF Manager or AdvancedCopy Manager Copy Control Module	Installation of one of the programs listed on the left is required. For use of only the AdvancedCopy Manager Copy Control Module functions provided by ETERNUS SF Version 15.0, install the AdvancedCopy Manager Copy Control Module. In all other cases, install the ETERNUS SF Manager (NOTE). However, if the ETERNUS SF Manager has been installed, register the license. For more information, refer to " Chapter 12 Adding and Changing Products in Use ".

NOTE: The AdvancedCopy Manager Copy Control Module is included in the ETERNUS SF Manager, but can also be installed as a standalone program.

1.3 Product license management

The use of these products is restricted by license management.

Therefore, in order to use a product, besides installing the related programs, it is necessary to register the license for that product.



See

.....
For information on the types and functional ranges of licenses, refer to "[Appendix B License Management](#)".
.....

Chapter 2 Operating Environment

This chapter explains the operating environment of ETERNUS SF Version 15.0.

2.1 Supported devices

This section describes devices that are supported by Express, Storage Cruiser and AdvancedCopy Manager.

Devices supported by Express

Express supports the following ETERNUS Disk storage systems.

- ETERNUS DX60/DX60 S2/DX80/DX80 S2/DX90/DX90 S2



Note

- The firmware versions of ETERNUS DX60/DX60 S2/DX80/DX80 S2/DX90/DX90 S2 must be as shown in the table below.

Table 2.1 ETERNUS Disk storage systems and compatible firmware version numbers

Model name	Compatible firmware version number
ETERNUS DX60/DX80/DX90	V10L31 or later
ETERNUS DX60 S2	V20L10 or later
ETERNUS DX80 S2/DX90 S2	V10L16 or later

- For using Remote Advanced Copy between DX90 and DX90 S2, the firmware version of DX90 must be updated to V10L61 or later.

Devices supported by Storage Cruiser

Storage Cruiser supports the following devices:

Device type	Device name
Storage device	ETERNUS DX series ETERNUS2000, ETERNUS4000, ETERNUS8000 ETERNUS CS800, ETERNUS CS2000 ETERNUS VS850 ETERNUS Tape library NetApp FAS Series NetApp V-Series
Fibre Channel switch	ETERNUS SN200, ETERNUS SN200MDS PRIMERGY BX600 Fibre Channel Switch Blade Brocade series McDATA Intrepid 6140, McDATA Sphereon 4500
Others	Solaris, Windows, Linux, HP-UX and VMware server nodes with Storage Cruiser's agent installed VMware Infrastructure 3 Version 3.5 or later VMware ESXi 3.5 or later VMware vSphere 4 or later



Note

The firmware versions of ETERNUS DX80 S2/DX90 S2 and DX400 S2 series must be as shown in the table below.

Table 2.2 ETERNUS Disk storage systems and compatible firmware version numbers

Model name	Compatible firmware version number
ETERNUS DX80 S2/DX90 S2	V10L16 or later
ETERNUS DX400 S2 series	V10L16 or later

Devices supported by AdvancedCopy Manager

AdvancedCopy Manager supports the following ETERNUS Disk storage systems.

- ETERNUS DX series
- ETERNUS2000, ETERNUS4000, ETERNUS8000

Note

- The firmware versions of ETERNUS DX60/DX60 S2/DX80/DX80 S2/DX90/DX90 S2 must be as shown in the table below.

Table 2.3 ETERNUS Disk storage system and compatible firmware version numbers

Model name	Compatible firmware version number
ETERNUS DX60/DX80/DX90	V10L31 or later
ETERNUS DX60 S2	V20L10 or later
ETERNUS DX80 S2/DX90 S2	V10L16 or later

- For using Remote Advanced Copy between DX90 and DX90 S2, the firmware version of DX90 must be updated to V10L61 or later.

Information

With AdvancedCopy Manager CCM, the devices listed below can use Copy command via SAN and via LAN.

Table 2.4 ETERNUS Disk storage system supporting Copy command via SAN and via LAN

Device name	Copy command via SAN		Copy command via LAN	
	Operation	Firmware version	Operation	Firmware version
ETERNUS DX60/DX60 S2/DX80/DX90	A	All versions	N/A	-
ETERNUS DX80 S2/DX90 S2	A	All versions	A	All versions
ETERNUS DX400 series	A	All versions	N/A	-
ETERNUS DX400 S2 series	A	All versions	A	All versions
ETERNUS DX8000 series	A	All versions	N/A	-
ETERNUS DX8000 S2 series	A	All versions	A	All versions
ETERNUS2000 models 100 and 200	A	V10L50 or later	N/A	-
ETERNUS4000 models 300 and 500	A	V11L50 or later	N/A	-
ETERNUS4000 models 400 and 600	A	All versions	N/A	-
ETERNUS8000 models 700, 900, 1100 and 2100	A	V11L50 or later	N/A	-
ETERNUS8000 models 800, 1200 and 2200	A	All versions	N/A	-

(A=Available, N/A=Not Available)

For details on Copy command via SAN and via LAN, refer to "System Configuration" in the "ETERNUS SF Operation Guide for Copy Control Module".

2.2 Operating environment of ETERNUS SF Manager

2.2.1 Hardware requirements

The server on which to install ETERNUS SF Manager must be a PRIMERGY server (For Windows and Linux environments) or SPARC Enterprise (For Solaris environment) on which the "2.2.2.1 Supported operating systems" can be installed.

Also, the following server specification is required:

Required CPU spec.
1GHz and over



Note

The PRIMERGY FT model and HA model are not supported.

2.2.2 Software requirements

This section describes the following software requirements:

- Supported operating systems
- Essential software
- Incompatible software

2.2.2.1 Supported operating systems

The operating system of the server on which to install ETERNUS SF Manager must be one of the following.

For Windows environment

No.	Operating system name	Required Hotfix	Remarks
1	Windows Server 2008 R2 Standard SP1	-	NOTE 1, 2 and 3
2	Windows Server 2008 R2 Enterprise SP1	-	NOTE 1, 2 and 3
3	Windows Server 2008 R2 Datacenter SP1	-	NOTE 1, 2 and 3
4	Windows Server 2008 R2 Standard	-	NOTE 1, 2 and 3
5	Windows Server 2008 R2 Enterprise	-	NOTE 1, 2 and 3
6	Windows Server 2008 R2 Datacenter	-	NOTE 1, 2 and 3
7	Windows Server 2008 Standard SP2 (32-bit)(64-bit)	-	NOTE 2 and 3
8	Windows Server 2008 Enterprise SP2 (32-bit)(64-bit)	-	NOTE 2 and 3
9	Windows Server 2008 Datacenter SP2 (32-bit)(64-bit)	-	NOTE 2 and 3
10	Windows Server 2008 Standard (32-bit)(64-bit)	KB952790	NOTE 2 and 3

No.	Operating system name	Required Hotfix	Remarks
11	Windows Server 2008 Enterprise (32-bit)(64-bit)	KB952790	NOTE 2 and 3
12	Windows Server 2008 Datacenter (32-bit)(64-bit)	KB952790	NOTE 2 and 3
13	Windows Server 2008 Standard SP2 without Hyper-V (32-bit)(64-bit)	-	NOTE 2 and 3
14	Windows Server 2008 Enterprise SP2 without Hyper-V (32-bit)(64-bit)	-	NOTE 2 and 3
15	Windows Server 2008 Datacenter SP2 without Hyper-V (32-bit)(64-bit)	-	NOTE 2 and 3
16	Windows Server 2008 Standard without Hyper-V (32-bit)(64-bit)	KB952790	NOTE 2 and 3
17	Windows Server 2008 Enterprise without Hyper-V (32-bit)(64-bit)	KB952790	NOTE 2 and 3
18	Windows Server 2008 Datacenter without Hyper-V (32-bit)(64-bit)	KB952790	NOTE 2 and 3
19	Windows Server 2003 R2, Standard Edition SP2	-	-
20	Windows Server 2003 R2, Enterprise Edition SP2	-	-
21	Windows Server 2003, Standard Edition SP2	-	-
22	Windows Server 2003, Enterprise Edition SP2	-	-

NOTE 1: Cluster Shared Volumes (CSV) are not supported.

NOTE 2: On 64-bit operating system, this product runs as a 32-bit application on the WOW64 (Windows 32-bit On Windows 64-bit) subsystem.

NOTE 3: The Server Core installation option is not supported.

For Solaris environment

No.	Operating system name	Remarks
1	Solaris 9	-
2	Solaris 10	NOTE 1 and 2

NOTE 1: Containers (Zones) are not supported.

NOTE 2: ZFS is not supported.

For Linux environment

No.	Operating system name	Remarks
1	Red Hat Enterprise Linux 5 (for x86)	NOTE 1, 7
2	Red Hat Enterprise Linux 5 (for Intel64)	NOTE 1, 2 and 8
3	Red Hat Enterprise Linux 6 (for x86)	NOTE 1 and 3
4	Red Hat Enterprise Linux 6 (for Intel64)	NOTE 1, 4, 5 and 6

NOTE 1: The operation in the environment that "Enable" the SELinux(Security-Enhanced Linux) is not supported. In this case, set the SELinux to disable.

NOTE 2: Operates in 32 bit and 64bit platforms.

NOTE 3: Requires the tcsh (tcsh-6.17-8.el6.i686.rpm or later) package.

NOTE 4: Running as a 32-bit application.

NOTE 5: When installing, select "Compatibility Arch Support" and install the package of 32 bit library.

NOTE 6: Requires the tcsh (tcsh-6.17-8.el6.x86_64.rpm or later) packages.

NOTE 7: Requires the sqlite (sqlite-3.3.6-2.i386.rpm or later), libtermcap (libtermcap-2.0.8-46.1.i386.rpm or later) and e2fsprogs-libs (e2fsprogs-libs-1.39-8.el5.i386.rpm or later) packages.

NOTE 8: Requires the sqlite (sqlite-3.3.6-2.x86_64.rpm or later), libtermcap (libtermcap-2.0.8-46.1.x86_64.rpm or later) and e2fsprogs-libs (e2fsprogs-libs-1.39-8.el5.x86_64.rpm) packages. If Symfoware Server x86 has been installed, the packages described in NOTE 7 are also required.

2.2.2.2 Essential software

For operating ETERNUS SF Manager, the following software is required:

For Windows environment

No.	Essential software name	Remarks
1	SNMP Trap Service (for Windows Server 2003) SNMP Trap (for Windows Server 2008)	This is Windows standard SNMP trap monitor service. It is included in the OS installation media.

For Linux environment

No.	Essential software name	Remarks
1	net-snmp	This is Linux standard SNMP package. It is included in the OS installation media. When installing net-snmp, lm-sensors package may be required. This package is also included in the OS installation media.
2	openssl	This is the package which supports secure communication between machines. It is included in the OS installation media. When installing openssl, another package may be required. This package is also included in the OS installation media. Install the following package version or later depending on operating system of the server. <ul style="list-style-type: none"> - For Red Hat Enterprise Linux 5 (for x86) openssl-0.9.8b-8.3.el5.i386.rpm - For Red Hat Enterprise Linux 5 (for Intel64) (NOTE 1) openssl-0.9.8b-8.3.el5.x86_64.rpm - For Red Hat Enterprise Linux 6 (NOTE 2) openssl-1.0.0-4.el6.i686.rpm
3	alsa-lib	This is the package which supports an audio and a MIDI function. It is included in the OS installation media. When installing alsa-lib, another package may be required. This package is also included in the OS installation media. Install the following package version or later depending on operating system of the server. <ul style="list-style-type: none"> - For Red Hat Enterprise Linux 5 (for x86) alsa-lib-1.0.12-3.el5.i386.rpm - For Red Hat Enterprise Linux 5 (for Intel64) (NOTE 1) alsa-lib-1.0.12-3.el5.x86_64.rpm - For Red Hat Enterprise Linux 6 (NOTE 2) alsa-lib-1.0.21-3.el6.i686.rpm
4	libX11	This is the package of X.Org X11 libX11 Runtime Library. It is included in the OS installation media. When installing libX11, another package may be required. This package is also included in the OS installation media. Install the following package version or later depending on operating system of the server. <ul style="list-style-type: none"> - For Red Hat Enterprise Linux 5 (for x86) libX11-1.0.3-8.el5.i386.rpm - For Red Hat Enterprise Linux 5 (for Intel64) (NOTE 1) libX11-1.0.3-8.el5.x86_64.rpm

No.	Essential software name	Remarks
		<ul style="list-style-type: none"> - For Red Hat Enterprise Linux 6 (NOTE 2) libX11-1.3-2.el6.i686.rpm
5	libXext	<p>This is the package of X.Org X11 libXext Runtime Library. It is included in the OS installation media.</p> <p>When installing libXext, another package may be required. This package is also included in the OS installation media.</p> <p>Install the following package version or later depending on operating system of the server.</p> <ul style="list-style-type: none"> - For Red Hat Enterprise Linux 5 (for x86) libXext-1.0.1-2.1.i386.rpm - For Red Hat Enterprise Linux 5 (for Intel64) (NOTE 1) libXext-1.0.1-2.1.x86_64.rpm - For Red Hat Enterprise Linux 6 (NOTE 2) libXext-1.1-3.el6.i686.rpm
6	libXi	<p>This is the package of X.Org X11 libXi Runtime Library. It is included in the OS installation media.</p> <p>When installing libXi, another package may be required. This package is also included in the OS installation media.</p> <p>Install the following package version or later depending on operating system of the server.</p> <ul style="list-style-type: none"> - For Red Hat Enterprise Linux 5 (for x86) libXi-1.0.1-3.1.i386.rpm - For Red Hat Enterprise Linux 5 (for Intel64) (NOTE 1) libXi-1.0.1-3.1.x86_64.rpm - For Red Hat Enterprise Linux 6 (NOTE 2) libXi-1.3-3.el6.i686.rpm
7	libXt	<p>This is the package of X.Org X11 libXt Runtime Library. It is included in the OS installation media.</p> <p>When installing libXt, another package may be required. This package is also included in the OS installation media.</p> <p>Install the following package version or later depending on operating system of the server.</p> <ul style="list-style-type: none"> - For Red Hat Enterprise Linux 5 (for x86) libXt-1.0.2-3.1.fc6.i386.rpm - For Red Hat Enterprise Linux 5 (for Intel64) (NOTE 1) libXt-1.0.2-3.1.fc6.x86_64.rpm - For Red Hat Enterprise Linux 6 (NOTE 2) libXt-1.0.7-1.el6.i686.rpm
8	libXtst	<p>This is the package of X.Org X11 libXtst Runtime Library. It is included in the OS installation media.</p> <p>When installing libXtst, another package may be required. This package is also included in the OS installation media.</p> <p>Install the following package version or later depending on operating system of the server.</p> <ul style="list-style-type: none"> - For Red Hat Enterprise Linux 5 (for x86) libXtst-1.0.1-3.1.i386.rpm

No.	Essential software name	Remarks
		<ul style="list-style-type: none"> - For Red Hat Enterprise Linux 5 (for Intel64) (NOTE 1) libXtst-1.0.1-3.1.x86_64.rpm - For Red Hat Enterprise Linux 6 (NOTE 2) libXtst-1.0.99.2-3.el6.i686.rpm
9	apr	<p>This is the package of Apache Portable Runtime Library. It is included in the OS installation media.</p> <p>When installing apr, another package may be required. This package is also included in the OS installation media.</p> <p>Install the following package version or later depending on operating system of the server.</p> <ul style="list-style-type: none"> - For Red Hat Enterprise Linux 5 (for x86) apr-1.2.7-11.i386.rpm - For Red Hat Enterprise Linux 5 (for Intel64) (NOTE 1) apr-1.2.7-11.x86_64.rpm - For Red Hat Enterprise Linux 6 (NOTE 2) apr-1.3.9-3.el6.i686.rpm
10	apr-util	<p>This is the package of Apache Portable Runtime Utility library. It is included in the OS installation media.</p> <p>When installing apr-util, another package may be required. This package is also included in the OS installation media.</p> <p>Install the following package version or later depending on operating system of the server.</p> <ul style="list-style-type: none"> - For Red Hat Enterprise Linux 5 (for x86) apr-util-1.2.7-6.i386.rpm - For Red Hat Enterprise Linux 5 (for Intel64) (NOTE 1) apr-util-1.2.7-6.x86_64.rpm - For Red Hat Enterprise Linux 6 (NOTE 2) apr-util-1.3.9-3.el6.i686.rpm
11	libgcc	<p>This is the package of GCC shared support library. It is included in the OS installation media.</p> <p>When installing libgcc, another package may be required. This package is also included in the OS installation media.</p> <p>Install the following package version or later depending on operating system of the server.</p> <ul style="list-style-type: none"> - For Red Hat Enterprise Linux 5 (for x86) libgcc-4.1.1-52.el5.i386.rpm - For Red Hat Enterprise Linux 5 (for Intel64) (NOTE 1) libgcc-4.1.1-52.el5.x86_64.rpm - For Red Hat Enterprise Linux 6 (NOTE 2) libgcc-4.4.4-13.el6.i686.rpm
12	glibc	<p>This is the package of GNU libc library. It is included in the OS installation media.</p> <p>When installing glibc, another package may be required. This package is also included in the OS installation media.</p> <p>Install the following package version or later depending on operating system of the server.</p> <ul style="list-style-type: none"> - For Red Hat Enterprise Linux 5 (for x86) glibc-2.5-12.i386.rpm

No.	Essential software name	Remarks
		<ul style="list-style-type: none"> - For Red Hat Enterprise Linux 5 (for Intel64) (NOTE 1) glibc-2.5-12.x86_64.rpm - For Red Hat Enterprise Linux 6 (NOTE 2) glibc-2.12-1.7.el6.i686.rpm
13	libstdc++	<p>This is the package of GNU Standard C++ Library. It is included in the OS installation media.</p> <p>When installing libstdc++, another package may be required. This package is also included in the OS installation media.</p> <p>Install the following package version or later depending on operating system of the server.</p> <ul style="list-style-type: none"> - For Red Hat Enterprise Linux 5 (for x86) libstdc++-4.1.1-52.el5.i386.rpm - For Red Hat Enterprise Linux 5 (for Intel64) (NOTE 1) libstdc++-4.1.1-52.el5.x86_64.rpm - For Red Hat Enterprise Linux 6 (NOTE 2) libstdc++-4.4.4-13.el6.i686.rpm
14	expat	<p>This is the library package to analyze XML. It is included in the OS installation media.</p> <p>When installing expat, another package may be required. This package is also included in the OS installation media.</p> <p>Install the following package version or later depending on operating system of the server.</p> <ul style="list-style-type: none"> - For Red Hat Enterprise Linux 5 (for x86) expat-1.95.8-8.2.1.i386.rpm - For Red Hat Enterprise Linux 5 (for Intel64) (NOTE 1) expat-1.95.8-8.2.1.x86_64.rpm - For Red Hat Enterprise Linux 6 (NOTE 2) expat-2.0.1-9.1.el6.i686.rpm
15	readline	<p>This is the package to edit text in a command line. It is included in the OS installation media.</p> <p>When installing readline, another package may be required. This package is also included in the OS installation media.</p> <p>Install the following package version or later depending on operating system of the server.</p> <ul style="list-style-type: none"> - For Red Hat Enterprise Linux 5 (for x86) readline-5.1-1.1.i386.rpm - For Red Hat Enterprise Linux 5 (for Intel64) (NOTE 1) readline-5.1-1.1.x86_64.rpm - For Red Hat Enterprise Linux 6 (NOTE 2) readline-6.0-3.el6.i686.rpm
16	zlib	<p>This is the library package to compress and uncompress zlib. It is included in the OS installation media.</p> <p>When installing zlib, another package may be required. This package is also included in the OS installation media.</p> <p>Install the following package version or later depending on operating system of the server.</p>

No.	Essential software name	Remarks
		<ul style="list-style-type: none"> - For Red Hat Enterprise Linux 5 (for x86) zlib-1.2.3-3.i386.rpm - For Red Hat Enterprise Linux 5 (for Intel64) (NOTE 1) zlib-1.2.3-3.x86_64.rpm - For Red Hat Enterprise Linux 6 (NOTE 2) zlib-1.2.3-25.el6.i686.rpm
17	unzip	<p>This is the utility package for unzipping zip files. It is included in the OS installation media.</p> <p>When installing unzip, another package may be required. This package is also included in the OS installation media.</p>
18	perl	<p>This is the package for Perl Program Language. It is included in the OS installation media.</p> <p>When installing perl, another package may be required. This package is also included in the OS installation media.</p>
19	gawk	<p>This is the package for Perl Program Language (GNU) of awk text manipulation utility. It is included in the OS installation media.</p> <p>When installing gawk, another package may be required. This package is also included in the OS installation media.</p>
20	openldap	<p>This is the package for header of Fnlb and static library. It is included in the OS installation media.</p> <p>When installing openldap, another package may be required. This package is also included in the OS installation media.</p>
21	chkconfig	<p>This is the package for system tools which control /etc/rc*.d hierarchy. It is included in the OS installation media.</p> <p>When installing chkconfig, another package may be required. This package is also included in the OS installation media.</p>
22	shadow-utils	<p>This is the package for utilities which control shadow password files and user/group accounts. It is included in the OS installation media.</p> <p>When installing shadow-utils, another package may be required. This package is also included in the OS installation media.</p>
23	coreutils	<p>This is the package for GNU Core Utilities. It is included in the OS installation media.</p> <p>When installing coreutils, another package may be required. This package is also included in the OS installation media.</p>

NOTE 1: When Symfoware Server x86 has been installed, also install the package of Red Hat Enterprise Linux 5 (for x86).

NOTE 2: When Red Hat Enterprise Linux 6 (for Intel64) has been installed, install the 32-bit package.

2.2.2.3 Incompatible software

ETERNUS SF Manager cannot be used on servers that have any of the following software installed.

No.	Incompatible software name	Remarks
1	Systemwalker Resource Coordinator	Excluding Systemwalker Resource Coordinator Virtual server Edition
2	SystemWalker/StorageMGR-M	-
3	SystemWalker/StorageMGR-A	-
4	Softek AdvancedCopy Manager-M	-
5	Softek AdvancedCopy Manager-A	-

No.	Incompatible software name	Remarks
6	Softek SANView	-
7	Softek Storage Cruiser	-
8	Product bundles consisting only of Symfoware Client	-
9	Symfoware Client	-
10	VMware vCenter Server	-
11	ETERNUS SF AdvancedCopy Manager's agent	-



Note

Also, servers with any software installed that uses Apache Tomcat cannot use ETERNUS SF Manager.

2.2.3 Required resources for installation

This section describes the resources that are required for installing ETERNUS SF Manager.

2.2.3.1 Required disk space for installation

For installation of ETERNUS SF Manager on a server, the required free disk space on that server is as follows:

For Windows environment

Directory name	Required disk space (Unit: MB)	Explanation
Program Directory	2850	"Program Directory" as specified during installation
Environment Directory	110	"Environment Directory" as specified during installation
Work Directory	40	"Work Directory" as specified during installation

For Solaris environment

Directory name	Required disk space (Unit: MB)	Explanation
/opt	2500	The directory to which the package will be installed.
/etc/opt	5	The directory to which the files for the environment settings will be installed.
/var/opt	1250	The directory to which the variable files (log files, temporary files, etc.) will be installed.

For Linux environment

Directory name	Required disk space (Unit: MB)	Explanation
/opt	2500	The directory to which the package will be installed.
/etc/opt	5	The directory to which the files for the environment settings will be installed.

Directory name	Required disk space (Unit: MB)	Explanation
/var/opt	1250	The directory to which the variable files (log files, temporary files, etc.) will be installed.

2.2.4 Required resources for operation (for Windows)

2.2.4.1 Required disk space for operation

For operating ETERNUS SF Manager, in addition to disk space described in "2.2.3.1 Required disk space for installation", the server on which it is installed must have free disk space as described below.

For operation as Express's manager

Directory name	Required disk space (Unit: MB)	Explanation
Program Directory	-	"Program Directory" as specified during installation
Environment Directory	A	"Environment Directory" as specified during installation "A" is database capacity of the repository for Manager. For details, refer to "3.1.4 Estimation of database size".
Work Directory	B	"Work Directory" as specified during installation "B" is required for performing the performance management. For details, refer to "Disk space required for performance management" as described below.

Disk space required for performance management

For performing the performance management, add disk space as described below, depending on the number of LUs (Logical Units) on the storage device to be managed, the number of DEs (Disk Enclosures) and the number of days for which performance data are to be stored.

$$8 * (240 + (1.2 + 0.3 * \text{Number_of_DEs} + 0.3 * (\text{Number_of_LUs} + \text{Number_of_RAIDGroups}[\text{NOTE}]))) * 1440 + (95 * \text{Number_of_DEs}) + (50 * (\text{Number_of_LUs} + \text{Number_of_RAIDGroups}[\text{NOTE}]))) / 1024 + 2.61$$

NOTE: The "Number_of_RAIDGroups" is the number of RAIDGroups created from the LUs.

For operation as Storage Cruiser's manager

Directory name	Required disk space (Unit: MB)	Explanation
Program Directory	-	"Program Directory" as specified during installation
Environment Directory	5 + 1(NOTE 1) + 1.2(NOTE 2) + 65(NOTE 3)	"Environment Directory" as specified during installation NOTE 1: Configuration definition file NOTE 2: Database (co-operation with middleware) NOTE 3: Database capacity of the repository for Manager - Calculated assuming a maximum of a 100 products.
Work Directory	1055 + 30(NOTE 4) + 20(NOTE 5) + A	"Work Directory" as specified during installation NOTE 4: Log NOTE 5: Database

Directory name	Required disk space (Unit: MB)	Explanation
		"A" is size described in " Repository for Storage Cruiser " as described below. - The database requirement is calculated for 1000 registered servers and two devices for each server. (12KB * the number of registered servers + 4KB * the number of registered devices)

Repository for Storage Cruiser

Add disk space as described below, depending on the numbers of storage devices, server nodes and switches to be managed.

$$\text{Required size (MB)} = 1 + \text{Number_of_devices_to_be_managed} * 4$$

Additionally, for performing the performance management, disk space is necessary depending on the number of devices from which to collect performance data and the number of days for which performance data are to be stored.

For details, refer to "[Appendix C Required Disk Space for Performance Management](#)".

For operation as AdvancedCopy Manager's manager

Directory name	Required disk space (Unit: MB)	Explanation
Program Directory	-	"Program Directory" as specified during installation
Environment Directory	-	"Environment Directory" as specified during installation
	$A + (B + 35 * C) / 1024$	Select no backup of Symfoware, when performing the backup operation.
	$A + (B + 35 * C) + (C + 0.5 * E)) / 1024$	Select backup of Symfoware, when performing the backup operation.
	$A + (1.1 * D) / 1024$	For performing the replication operation
Work Directory	$107 + F$	"Work Directory" as specified during installation

- "A" is database capacity of the repository for Manager. For details, refer to "[3.1.4 Estimation of database size](#)".
- "B" is number of backup volumes.
- "C" is number of transaction volumes.
- "D" is number of volume pairs for replication management.
- "E" is number of Data Structure Instance (DSI) for all database spaces subject to backup.
- "F" is capacity of saved file that is output according to "Volume lock error investigation function" in the "ETERNUS SF AdvancedCopy Manager Operation Guide (for Windows)".

The output for each number of backup and transaction volumes and for each volume pair for replication management is made in sizes between several hundred KB and 2 MB each time an "in-use lock error" occurs.

Assuming a size of 2 MB per saved volume file, for n times an "in-use lock error" occurs, capacity d is determined by the following formula:

$$F = (B + C + 2 * D) * 2(\text{MB}) * n(\text{times})$$

2.2.4.2 Required memory for operation

For operating ETERNUS SF Manager, the server on which it is installed must have the following amount of memory.

2.2.5 Required resources for operation (for Solaris)

2.2.5.1 Required disk space for operation

For operating ETERNUS SF Manager, in addition to disk space described in "[2.2.3.1 Required disk space for installation](#)", the server on which it is installed must have free disk space as described below.

For operation as Storage Cruiser's manager

Directory name	Required disk space (Unit: MB)	Explanation
/opt/FJSVswstf	-	The directory to which the package will be installed.
/etc/opt/FJSVswstf	5 + 1(NOTE 1) + 1.2(NOTE 2)+65(NOTE 3)	The directory to which the files for the environment settings will be installed. NOTE 1 : Configuration definition file NOTE 2 : Database (co-operation with middleware) NOTE 3 : Database capacity of the repository for Manager - Calculated assuming a maximum of a 100 products.
/var/opt/FJSVswst	1055 + 30(NOTE 4) + 20(NOTE 5) + (NOTE 6)	The directory to which the variable files (log files, temporary files, etc.) will be installed. NOTE 4 : Log NOTE 5 : Database NOTE 6 : Repository for Storage Cruiser - The database requirement is calculated for 1000 registered servers and two devices for each server. (12KB * the number of registered servers + 4KB * the number of registered devices)

Repository for Storage Cruiser

Add disk space as described below, depending on the numbers of storage devices, server nodes and switches to be managed.

$$\text{Required size (MB)} = 1 + \text{Number_of_devices_to_be_managed} * 4$$

Additionally, for performing the performance management, disk space is necessary depending on the number of devices from which to collect performance data and the number of days for which performance data are to be stored.

For details, refer to "[Appendix C Required Disk Space for Performance Management](#)".

For operation as AdvancedCopy Manager's manager

Directory name	Required disk space (Unit: MB)	Explanation
Environment Directory	$(A + 35 * B) / 1024$	Select no backup of Symfoware, when performing the backup operation.
	$((A + 35 * B) + (B + 0.5 * C)) / 1024$	Select backup of Symfoware, when performing the backup operation.
	$(1.1 * D) / 1024$	For performing the replication operation
	0.4	Essential

Directory name	Required disk space (Unit: MB)	Explanation
Work Directory	13	Essential
	The calculated capacity in " 3.1.4 Estimation of database size "	Database area
/var	106	Essential

- "A" is number of backup volumes.
- "B" is number of transaction volumes.
- "C" is number of DSI for all database spaces subject to backup.
- "D" is number of volume pairs for replication management.

2.2.5.2 Required memory for operation

For operating ETERNUS SF Manager, the server on which it is installed must have the following amount of memory.

- 1024MB

2.2.6 Required resources for operation (for Linux)

2.2.6.1 Required disk space for operation

For operating ETERNUS SF Manager, in addition to disk space described in "[2.2.3.1 Required disk space for installation](#)", the server on which it is installed must have free disk space as described below.

For operation as Express's manager

Directory name	Required disk space (Unit: MB)	Explanation
/opt/FJSVswstf	-	"Program Directory" as specified during installation
/etc/opt/FJSVswstf	(A)	"Environment Directory" as specified during installation "A" is database capacity of the repository for Manager. For details, refer to " 3.1.4 Estimation of database size ".
/var/opt/FJSVswstf	(B)	"Work Directory" as specified during installation "B" is required for performing the performance management. For details, refer to " Disk space required for performance management " as described below.

Disk space required for performance management

For performing the performance management, add disk space as described below, depending on the number of LUs (Logical Units) on the storage device to be managed, the number of DEs (Disk Enclosures) and the number of days for which performance data are to be stored.

$$8 * (240 + (1.2 + 0.3 * \text{Number_of_DEs} + 0.3 * (\text{Number_of_LUs} + \text{Number_of_RAIDGroups}[\text{NOTE}]))) * 1440 + (95 * \text{Number_of_DEs}) + (50 * (\text{Number_of_LUs} + \text{Number_of_RAIDGroups} [\text{NOTE}]))) / 1024 + 2.61$$

NOTE: The "Number_of_RAIDGroups" is the number of RAIDGroups created from the LUs.

For operation as Storage Cruiser's manager

Directory name	Required disk space (Unit: MB)	Explanation
/opt/FJSVswstf	-	The directory to which the package will be installed.
/etc/opt/FJSVswstf	5 + 1(NOTE 1) + 1.2(NOTE 2)+65(NOTE 3)	The directory to which the files for the environment settings will be installed. NOTE 1 : Configuration definition file NOTE 2 : Database (co-operation with middleware) NOTE 3 : Database capacity of the repository for Manager - Calculated assuming a maximum of a 100 products.
/var/opt/FJSVswstf	1055 + 30(NOTE 4) + 20(NOTE 5) + (NOTE 6)	The directory to which the variable files (log files, temporary files, etc.) will be installed. NOTE 4 : Log NOTE 5 : Database NOTE 6 : Repository for Storage Cruiser - The database requirement is calculated for 1000 registered servers and two devices for each server. (12KB * the number of registered servers + 4KB * the number of registered devices)

Repository for Storage Cruiser

Add disk space as described below, depending on the numbers of storage devices, server nodes and switches to be managed.

$$\text{Required size (MB)} = 1 + \text{Number_of_devices_to_be_managed} * 4$$

Additionally, for performing the performance management, disk space is necessary depending on the number of devices from which to collect performance data and the number of days for which performance data are to be stored.

For details, refer to "[Appendix C Required Disk Space for Performance Management](#)".

For operation as AdvancedCopy Manager's manager

Directory name	Required disk space (Unit: MB)	Explanation
Environment Directory	$(A + 35 * B) / 1024$	Select no backup of Symfoware, when performing the backup operation.
	$((A + 35 * B) + (B + 0.5 * C)) / 1024$	Select backup of Symfoware, when performing the backup operation.
	$(1.1 * D) / 1024$	For performing the replication operation
	0.4	Essential
Work Directory	13	Essential
	The calculated capacity in " 3.1.4 Estimation of database size "	Database area
/var	106	Essential

- "A" is number of backup volumes.
- "B" is number of transaction volumes.
- "C" is number of DSI for all database spaces subject to backup.

- "D" is number of volume pairs for replication management.

2.2.6.2 Required memory for operation

For operating ETERNUS SF Manager, the server on which it is installed must have the following amount of memory.

- 1024MB

2.3 Operating environment of Storage Cruiser's agent

2.3.1 Hardware requirements

Servers on which to install Storage Cruiser's agent must be servers on which the "2.3.2.1 Supported operating systems" can be installed.

For Windows environment

The server must fulfill one of the following conditions:

- The server is PRIMEQUEST model.
- The server specifications fulfill below requirements.

Required CPU spec.
Intel(R) Pentium(R) III processor, 1GHz and over

For Solaris environment

The server must be as follows:

- Any one of sparc/SUN servers

For Linux environment

The server must fulfill one of the following conditions:

- The server is PRIMEQUEST model.
- The server specifications fulfill below requirements.

Required CPU spec.
Intel(R) Pentium(R) III processor, 1GHz and over

For HP-UX environment

The server must be as follows:

- Any one of HP-UX servers

For VMware environment

Refer to "VMware Infrastructure 3 Installation Guide for PRIMERGY" for details of hardware requirements.

2.3.2 Software requirements

This section describes the following software requirements:

- Supported operating systems
- Essential software

- Incompatible software

2.3.2.1 Supported operating systems

The operating system of the server on which to install Storage Cruiser's agent must be one of the following.

For Windows environment

No.	Operating system name	Required Hotfix	Remarks
1	Windows Server 2008 R2 Foundation SP1		NOTE 1 and 3
2	Windows Server 2008 R2 Standard SP1	-	NOTE 1, 2 and 3
3	Windows Server 2008 R2 Enterprise SP1	-	NOTE 1, 2 and 3
4	Windows Server 2008 R2 Datacenter SP1	-	NOTE 1, 2 and 3
5	Windows Server 2008 R2 Foundation		NOTE 1 and 3
6	Windows Server 2008 R2 Standard	-	NOTE 1, 2 and 3
7	Windows Server 2008 R2 Enterprise	-	NOTE 1, 2 and 3
8	Windows Server 2008 R2 Datacenter	-	NOTE 1, 2 and 3
9	Windows Server 2008 Standard SP2 (32-bit)(64-bit)	-	NOTE 1, 2 and 3
10	Windows Server 2008 Enterprise SP2 (32-bit)(64-bit)	-	NOTE 1, 2 and 3
11	Windows Server 2008 Datacenter SP2 (32-bit)(64-bit)	-	NOTE 1, 2 and 3
12	Windows Server 2008 Standard (32-bit)(64-bit)	-	NOTE 1, 2 and 3
13	Windows Server 2008 Enterprise (32-bit)(64-bit)	-	NOTE 1, 2 and 3
14	Windows Server 2008 Datacenter (32-bit)(64-bit)	-	NOTE 1, 2 and 3
15	Windows Server 2008 Standard SP2 without Hyper-V (32-bit)(64-bit)	-	NOTE 1 and 2
16	Windows Server 2008 Enterprise SP2 without Hyper-V (32-bit)(64-bit)	-	NOTE 1 and 2
17	Windows Server 2008 Datacenter SP2 without Hyper-V (32-bit)(64-bit)	-	NOTE 1 and 2
18	Windows Server 2008 Standard without Hyper-V (32-bit)(64-bit)	-	NOTE 1 and 2
19	Windows Server 2008 Enterprise without Hyper-V (32-bit)(64-bit)	-	NOTE 1 and 2
20	Windows Server 2008 Datacenter without Hyper-V (32-bit)(64-bit)	-	NOTE 1 and 2
21	Windows Server 2003 R2, Standard Edition SP2	-	-
22	Windows Server 2003 R2, Standard x64 Edition SP2	-	NOTE 1
23	Windows Server 2003 R2, Enterprise Edition SP2	-	-
24	Windows Server 2003 R2, Enterprise x64 Edition SP2	-	NOTE 1
25	Windows Server 2003, Standard Edition SP2	-	-
26	Windows Server 2003, Standard x64 Edition SP2	-	NOTE 1
27	Windows Server 2003, Enterprise Edition SP2	-	-
28	Windows Server 2003, Enterprise x64 Edition SP2	-	NOTE 1

NOTE 1: On 64-bit operating system, this product runs as a 32-bit application on the WOW64 (Windows 32-bit On Windows 64-bit) subsystem.

NOTE 2: The Server Core installation option is not supported.

NOTE 3: Guest OS is not supported in a Hyper-V environment.

For Solaris environment

No.	Operating system name	Required patch	Remarks
1	Solaris 9	Latest patch	-
2	Solaris 10	Latest patch	NOTE

NOTE: Operation of Solaris Containers is supported only within the global zone.

For Linux environment

No.	Operating system name	Required patch	Remarks
1	Red Hat Enterprise Linux AS (v.4 for x86)	Bundle correction U05111 or later	-
2	Red Hat Enterprise Linux AS (v.4 for EM64T)	Bundle correction U05121 or later	NOTE 1
3	Red Hat Enterprise Linux ES (v.4 for x86)	Bundle correction U05111 or later	-
4	Red Hat Enterprise Linux ES (v.4 for EM64T)	Bundle correction U05121 or later	NOTE 1
5	Red Hat Enterprise Linux 5 (for x86)	-	-
6	Red Hat Enterprise Linux 5 (for Intel64)	-	NOTE 2
7	Red Hat Enterprise Linux 6 (for x86)	-	-
8	Red Hat Enterprise Linux 6 (for Intel64)	-	NOTE 2
9	SUSE Linux Enterprise Server 11 Service Pack 1 for x86	-	-
10	SUSE Linux Enterprise Server 11 Service Pack 1 for EM64T	-	NOTE 2

NOTE 1: Running as a 32-bit application

NOTE 2: Running as a 64-bit native application

For HP-UX environment

No.	Operating system name	Required patch	Remarks
1	HP-UX 11.0	Latest patch	NOTE 1
2	HP-UX 11i v1	Latest patch	NOTE 1
3	HP-UX 11i v2(PA-RISC)	Latest patch	NOTE 1
4	HP-UX 11i v2(Itanium)	Latest patch	NOTE 2
5	HP-UX 11i v3(PA-RISC)	Latest patch	NOTE 1
6	HP-UX 11i v3(Itanium)	Latest patch	NOTE 2

NOTE 1: Only HP 9000 servers

NOTE 2: Only HP Integrity servers

For VMware environment

No.	Operating system name	Required patch	Remarks
1	VMware Infrastructure 3 Foundation	-	NOTE
2	VMware Infrastructure 3 Standard	-	NOTE
3	VMware Infrastructure 3 Enterprise	-	NOTE

NOTE: Operation within a guest OS in a Virtual Machine (VM) environment is not supported.

2.3.2.2 Essential software

For operating Storage Cruiser's agent, the following software is required.

For Windows, Solaris, Linux and VMware environments

No.	Essential software name	Remarks
1	SNIA HBA API library	Necessary for managing RAID devices with Storage Cruiser. Prepare the required libraries for the HBA and OS versions being used. Additionally, the preparation methods vary depending on the HBA and driver versions. Refer to " 6.1.3 SNIA HBA API library installation (HP-UX environment excluded) " for details.

For HP-UX environment

There is no essential software.

2.3.2.3 Incompatible software

Storage Cruiser's agent cannot be used on servers that have any of the following software installed.

For Windows environment

No.	Incompatible software name	Version / level	Remarks
1	Systemwalker Resource Coordinator	All	Excluding Systemwalker Resource Coordinator Virtual server Edition
2	Softek Storage Cruiser	All	-

For Solaris environment

No.	Incompatible software name	Version / level	Remarks
1	Systemwalker Resource Coordinator	All	-
2	Softek Storage Cruiser	All	-

For Linux environment

No.	Incompatible software name	Version / level	Remarks
1	Systemwalker Resource Coordinator	All	Excluding Systemwalker Resource Coordinator Virtual server Edition
2	Softek Storage Cruiser	All	-

For HP-UX environment

No.	Incompatible software name	Version / level	Remarks
1	Softek Storage Cruiser	All	-

For VMware environment

No.	Incompatible software name	Version / level	Remarks
1	Systemwalker Resource Coordinator	All	Excluding Systemwalker Resource Coordinator Virtual server Edition

2.3.3 Required resources for installation

This section describes the resources that are required for installing Storage Cruiser's agent.

2.3.3.1 Required disk space for installation

For installation of Storage Cruiser's agent on a server, the required free disk space on that server is as follows:

For Windows environment

Directory name	Required disk space (Unit: MB)	Explanation
Program Directory	100	"Program Directory" as specified during installation. Default is "C:\ETERNUS_SF".
Environment Directory	1	"Environment Directory" as specified during installation. Default is "C:\ETERNUS_SF".
Work Directory	1	"Work Directory" as specified during installation. Default is "C:\ETERNUS_SF".

For Solaris environment

Directory name	Required disk space (Unit: MB)	Explanation
program install directory	100	Directory into which to install the package. Default is "/opt".
fixed configuration directory	3	Directory into which to install the files for the environment settings. Default is "/etc/opt".
variable configuration directory	240	Directory into which to install variable files (log files, temporary files, etc.) Default is "/var/opt".

For Linux environment

Directory name	Required disk space (Unit: MB)	Explanation
/opt	101	Directory into which to install the package
/etc/opt	1	Directory into which to install the files for the environment settings
/var/opt	205	Directory into which to install variable files (log files, temporary files, etc.)

For HP-UX environment

- For HP-UX 11.0 or HP-UX 11i

Directory name	Required disk space (Unit: MB)	Explanation
/opt	130	Directory into which to install the package
/etc/opt	0.2	Directory into which to install the files for the environment settings

Directory name	Required disk space (Unit: MB)	Explanation
/var/opt	0.2	Directory into which to install variable files (log files, temporary files, etc.)

- For HP-UX 11i v2 or HP-UX 11i v3

Directory name	Required disk space (Unit: MB)	Explanation
/opt	150	Directory into which to install the package
/etc/opt	0.02	Directory into which to install the files for the environment settings
/var/opt	0.02	Directory into which to install variable files (log files, temporary files, etc.)

For VMware environment

Directory name	Required disk space (Unit: MB)	Explanation
/opt	101	Directory into which to install the package
/etc/opt	1	Directory into which to install the files for the environment settings
/var/opt	205	Directory into which to install variable files (log files, temporary files, etc.)

2.3.4 Required resources for operation

2.3.4.1 Required disk space for operation

For operating Storage Cruiser's agent, in addition to disk space described in "[2.3.3.1 Required disk space for installation](#)", the server on which it is installed must have free disk space as described below.

For Windows environment

Directory name	Required disk space (Unit: MB)	Explanation
Environment Directory	0.1	"Environment Directory" as specified during installation
Work Directory	20	"Work Directory" as specified during installation

For Solaris environment

Directory name	Required disk space (Unit: MB)	Explanation
fixed configuration directory	1	Directory into which to install the files for the environment settings
variable configuration directory	62	Directory into which to install variable files (log files, temporary files, etc.)

For Linux environment

Directory name	Required disk space (Unit: MB)	Explanation
fixed configuration directory	0.3	Directory into which to install the files for the environment settings
variable configuration directory	48	Directory into which to install variable files (log files, temporary files, etc.)

For HP-UX environment

Directory name	Required disk space (Unit: MB)	Explanation
fixed configuration directory	0.1	Directory into which to install the files for the environment settings
variable configuration directory	20	Directory into which to install variable files (log files, temporary files, etc.)

For VMware environment

Directory name	Required disk space (Unit: MB)	Explanation
fixed configuration directory	0.3	Directory into which to install the files for the environment settings
variable configuration directory	48	Directory into which to install variable files (log files, temporary files, etc.)

2.3.4.2 Required memory for operation

For operating Storage Cruiser's agent, the server on which it is installed must have the following amount of memory.

Operating system	Required memory (Unit: MB)
Windows	256
Solaris	300
Linux	256
HP-UX	32
VMware	46

2.3.4.3 Required swap size for operation

For operating Storage Cruiser's agent, the following amount of swap memory is necessary:

Operating system	Required memory (Unit: MB)
Windows	-
Solaris	250
Linux	-
HP-UX	32

Operating system	Required memory (Unit: MB)
VMware	-

2.4 Operating environment of AdvancedCopy Manager's agent

2.4.1 Hardware requirements

Servers on which to install AdvancedCopy Manager's agent must be servers on which the "2.4.2.1 Supported operating systems" can be installed.

Also, these servers must fulfill the specifications described in "2.4.3 Required resources for installation" and "2.4.4 Required resources for operation".



Note

For Windows environment, the PRIMERGY FT model and HA model are not supported.

2.4.2 Software requirements

This section describes the following software requirements:

- Supported operating systems
- Essential software
- Incompatible software

2.4.2.1 Supported operating systems

The operating system of the server on which to install AdvancedCopy Manager's agent must be one of the following.

For Windows environment

No.	Operating system name	Required Hotfix	Remarks
1	Windows Server 2008 R2 Standard SP1		NOTE 2
2	Windows Server 2008 R2 Enterprise SP1	-	NOTE 2
3	Windows Server 2008 R2 Datacenter SP1	-	NOTE 2
4	Windows Server 2008 R2 Standard	-	NOTE 2
5	Windows Server 2008 R2 Enterprise		NOTE 2
6	Windows Server 2008 R2 Datacenter	-	NOTE 2
7	Windows Server 2008 Standard SP2 (32-bit)(64-bit)	-	NOTE 2 and 3
8	Windows Server 2008 Enterprise SP2 (32-bit)(64-bit)	-	NOTE 2 and 3
9	Windows Server 2008 Datacenter SP2 (32-bit)(64-bit)	-	NOTE 2 and 3
10	Windows Server 2008 Standard (32-bit)(64-bit)	-	NOTE 2 and 3
11	Windows Server 2008 Enterprise (32-bit)(64-bit)	-	NOTE 2 and 3

No.	Operating system name	Required Hotfix	Remarks
12	Windows Server 2008 Datacenter (32-bit)(64-bit)	-	NOTE 2 and 3
13	Windows Server 2008 Standard SP2 without Hyper-V (32-bit)(64-bit)	-	NOTE 2
14	Windows Server 2008 Enterprise SP2 without Hyper-V (32-bit)(64-bit)	-	NOTE 2
15	Windows Server 2008 Datacenter SP2 without Hyper-V (32-bit)(64-bit)	-	NOTE 2
16	Windows Server 2008 Standard without Hyper-V (32-bit)(64-bit)	-	NOTE 2
17	Windows Server 2008 Enterprise without Hyper-V (32-bit)(64-bit)	-	NOTE 2
18	Windows Server 2008 Datacenter without Hyper-V (32-bit)(64-bit)	-	NOTE 2
19	Windows Server 2003 R2, Standard Edition SP2	-	-
20	Windows Server 2003 R2, Standard x64 Edition SP2	-	NOTE 1
21	Windows Server 2003 R2, Enterprise Edition SP2	-	-
22	Windows Server 2003 R2, Enterprise x64 Edition SP2	-	NOTE 1
23	Windows Server 2003, Standard Edition SP2	-	-
24	Windows Server 2003, Standard x64 Edition SP2	-	NOTE 1
25	Windows Server 2003, Enterprise Edition SP2	-	-
26	Windows Server 2003, Enterprise x64 Edition SP2	-	NOTE 1

NOTE 1: On 64-bit operating system, this product runs as a 32-bit application on the WOW64 (Windows 32-bit On Windows 64-bit) subsystem.

NOTE 2: The Server Core installation option is not supported.

NOTE 3: Guest OS is not supported in a Hyper-V environment.

Note

- For Windows Server 2003, security risks originating in the OS may occur. For details, please refer to the following link:

<http://www.microsoft.com/whdc/system/vista/services.mspx>

- Installation in Windows is not possible if it has the role of Active Directory domain services.

For Solaris environment

No.	Operating system name	Remarks
1	Solaris 9	-
2	Solaris 10	NOTE

NOTE: Operation of Solaris Containers is supported only within the global zone.

For Linux environment

No.	Operating system name	Remarks
1	Red Hat Enterprise Linux AS (v.4 for x86)	NOTE 1
2	Red Hat Enterprise Linux AS (v.4 for EM64T)	NOTE 1 and 2
3	Red Hat Enterprise Linux ES (v.4 for x86)	NOTE 1
4	Red Hat Enterprise Linux ES (v.4 for EM64T)	NOTE 1 and 2
5	Red Hat Enterprise Linux 5 (for x86)	NOTE 1
6	Red Hat Enterprise Linux 5 (for Intel64)	NOTE 1 and 2

No.	Operating system name	Remarks
7	Red Hat Enterprise Linux 6 (for x86)	NOTE 3
8	Red Hat Enterprise Linux 6 (for Intel64)	NOTE 2, 4 and 5
9	SUSE Linux Enterprise Server 11 Service Pack 1 for x86	-
10	SUSE Linux Enterprise Server 11 Service Pack 1 for EM64T	NOTE 2

NOTE 1: The volumes that size is larger than 2TB are not supported.

NOTE 2: Running as a 32-bit application

NOTE 3: Requires the tcsh (tcsh-6.17-8.el6.i686.rpm or later) package.

NOTE 4: Requires the tcsh (tcsh-6.17-8.el6.x86_64.rpm or later) package.

NOTE 5: Requires the glibc (glibc-2.12-1.7.el6.i686.rpm or later), libstdc++ (libstdc++-4.4.4-13.el6.i686.rpm or later) and libgcc (libgcc-4.4.4-13.el6.i686.rpm) packages.

For HP-UX environment

No.	Operating system name	Remarks
1	HP-UX 11.0	NOTE
2	HP-UX 11i v1	
3	HP-UX 11i v2(PA-RISC)	
4	HP-UX 11i v2(Itanium)	
5	HP-UX 11i v3(Itanium)	

NOTE: The volume of 2TB and over is not supported.

For AIX environment

No.	Operating system name	Remarks
1	AIX 5L 5.1	NOTE
2	AIX 5L 5.2	
3	AIX 5L 5.3	

NOTE: The volume of 2TB and over is not supported.

2.4.2.2 Essential software

There is no essential software.

2.4.2.3 Incompatible software

AdvancedCopy Manager's agent cannot be used on servers that have any of the following software installed.

For Windows environment

No.	Incompatible software name	Version / level	Remarks
1	SystemWalker/StorageMGR-M	All	-
2	SystemWalker/StorageMGR-A	All	-
3	Softek AdvancedCopy Manager-M	All	-
4	Softek AdvancedCopy Manager-A	All	-
5	ETERNUS SF AdvancedCopy Manager's manager	All	-

No.	Incompatible software name	Version / level	Remarks
6	ETERNUS SF Manager	All	-

For Solaris environment

No.	Incompatible software name	Version / level	Remarks
1	SystemWalker/StorageMGR-M	All	-
2	SystemWalker/StorageMGR-A	All	-
3	Softek AdvancedCopy Manager-M	All	-
4	Softek AdvancedCopy Manager-A	All	-
5	ETERNUS SF AdvancedCopy Manager's manager	All	-
6	ETERNUS SF Manager	All	-

For Linux environment

No.	Incompatible software name	Version / level	Remarks
1	Softek AdvancedCopy Manager-M	All	-
2	Softek AdvancedCopy Manager-A	All	-
3	ETERNUS SF AdvancedCopy Manager's manager	All	-
4	ETERNUS SF Manager	All	-

For HP-UX environment

No.	Incompatible software name	Version / level	Remarks
1	SystemWalker/StorageMGR-A	All	-
2	Softek AdvancedCopy Manager-A	All	-

For AIX environment

No.	Incompatible software name	Version / level	Remarks
1	Softek AdvancedCopy Manager-A	All	-

2.4.3 Required resources for installation

This section describes the resources that are required for installing AdvancedCopy Manager's agent.

2.4.3.1 Required disk space for installation

For installation of AdvancedCopy Manager's agent on a server, the required free disk space on that server is as follows:

For Windows environment

Directory name	Required disk space (Unit: MB)	Explanation
Program Directory	100	"Program Directory" as specified during installation
Environment Directory	1	"Environment Directory" as specified during installation
Work Directory	50	"Work Directory" as specified during installation

For Solaris environment

Directory name	Required disk space (Unit: MB)	Explanation
Program install directory	130	Directory into which to install the package
Fixed configuration directory	0.2	Directory into which to install the files for the environment settings
Modifying configuration directory	2.2	Directory into which to install variable files (log files, temporary files, etc.)
/opt	0.2	Directory of operating system

For Linux environment

Directory name	Required disk space (Unit: MB)	Explanation
Program install directory	120	Directory into which to install the package
Fixed configuration directory	0.2	Directory into which to install the files for the environment settings
Modifying configuration directory	2.2	Directory into which to install variable files (log files, temporary files, etc.)
/opt	0.2	Directory of operating system

For HP-UX environment

Directory name	Required disk space (Unit: MB)	Explanation
Program install directory	120	Directory into which to install the package
Fixed configuration directory	0.2	Directory into which to install the files for the environment settings
Modifying configuration directory	2.2	Directory into which to install variable files (log files, temporary files, etc.)
/opt	0.2	Directory of operating system

For AIX environment

Directory name	Required disk space (Unit: MB)	Explanation
Program install directory	200	Directory into which to install the package
Fixed configuration directory	0.2	Directory into which to install the files for the environment settings
Modifying configuration directory	2.2	Directory into which to install variable files (log files, temporary files, etc.)
/opt	0.2	Directory of operating system

2.4.4 Required resources for operation

2.4.4.1 Required disk space for operation

For operating AdvancedCopy Manager's agent, in addition to disk space described in "2.4.3.1 Required disk space for installation", the server on which it is installed must have free disk space as described below.

For Windows environment

Directory name	Required disk space (Unit: MB)	Explanation
Environment Directory	$(A + 35 * B) / 1024$	The required capacity in case when performing the backup operation in the Managed Server and select no backup of Symfoware.
	$((A + 35 * B) + (B + 0.5 * D)) / 1024$	The required capacity in case when performing the backup operation in the Managed Server and select backup of Symfoware.
	$(1.1 * C) / 1024$	For performing the replication operation on the Managed Server
Work Directory	$107 + E$	Mandatory

- "A" is number of backup volumes.
- "B" is number of transaction volumes.
- "C" is number of volume pairs for replication management.
- "D" is number of DSI for all database spaces subject to backup.
- "E" is capacity of saved file that is output according to "Volume lock error investigation function" in the "ETERNUS SF AdvancedCopy Manager Operation Guide (for Windows)".

The output for each number of backup and transaction volumes and for each volume pair for replication management is made in sizes between several hundred KB and 2 MB each time an "in-use lock error" occurs.

Assuming a size of 2 MB per saved volume file, for n times an "in-use lock error" occurs, capacity E is determined by the following formula:

$$E = (A + B + 2 * C) * 2(\text{MB}) * n(\text{times})$$

For Solaris, Linux, HP-UX and AIX environments

Directory name	Required disk space (Unit: MB)				Explanation
	Solaris	Linux	HP-UX	AIX	
Fixed configuration directory	$(A + 35 * B) / 1024$				The required capacity in case when performing the backup operation in the Managed Server and select no backup of Symfoware.
	$((A + 35 * B) + (B + 0.5 * C)) / 1024$		Exempt		The required capacity in case when performing the backup operation in the Managed Server and select backup of Symfoware.
	$(1.1 * D) / 1024$				For performing the replication operation on the Managed Server
	0.1				Mandatory
Modifying configuration directory	7		5		Mandatory
/var	49				Mandatory

- "Fixed configuration directory" is the installation destination directory for environment settings which is specified during installing this software.

- "Modifying configuration directory" is the installation destination directory for work files (log file, temporary file and so on) which is specified during installing this software.
- "A" is number of backup volumes.
- "B" is number of transaction volumes.
- "C" is number of DSI for all database spaces subject to backup.
- "D" is number of volume pairs for replication management.

2.4.4.2 Required memory for operation

For operating AdvancedCopy Manager's agent, the server on which it is installed must have the following amount of memory.

Operating system	Required disk space (Unit: MB)	Explanation
Windows	64	Mandatory
Solaris, Linux	29	Mandatory
	10	Performing a 1-slice backup command in the environment on which 16 slices of transaction volume and 60 slices of backup volume are defined.
HP-UX, AIX	13	Mandatory
	10	Performing a 1-slice backup command in the environment on which 16 slices of transaction volume and 60 slices of backup volume are defined.

2.4.4.3 Required swap size for operation

For operating AdvancedCopy Manager's agent, the following amount of swap memory is necessary:

Operating system	Required disk space (Unit: MB)	Explanation
Windows	-	-
Solaris, Linux	11.2	Mandatory
	11	Performing a 1-slice backup command in the environment on which 16 slices of transaction volume and 60 slices of backup volume are defined.
HP-UX, AIX	3.2	Mandatory
	11	Performing a 1-slice backup command in the environment on which 16 slices of transaction volume and 60 slices of backup volume are defined.

2.5 Operating environment of AdvancedCopy Manager CCM

This section explains the operating environment for standalone use of AdvancedCopy Manager CCM.

2.5.1 Hardware requirements

Servers on which to install AdvancedCopy Manager CCM must be servers on which the "2.5.2.1 Supported operating systems" can be installed.

Also, these servers must fulfill the specifications described in "2.5.3 Required resources for installation" and "2.5.4 Required resources for operation".



For Windows environment, the PRIMERGY FT model and HA model are not supported.

2.5.2 Software requirements

This section describes the following software requirements:

- Supported operating systems
- Essential software
- Incompatible software

2.5.2.1 Supported operating systems

The operating system of the server on which to install AdvancedCopy Manager CCM must be one of the following.

For Windows environment

No.	Operating system name	Required Hotfix	Remarks
1	Windows Server 2008 R2 Standard SP1	-	NOTE 1 and 2
2	Windows Server 2008 R2 Enterprise SP1	-	NOTE 1 and 2
3	Windows Server 2008 R2 Datacenter SP1	-	NOTE 1 and 2
4	Windows Server 2008 R2 Standard	-	NOTE 1 and 2
5	Windows Server 2008 R2 Enterprise	-	NOTE 1 and 2
6	Windows Server 2008 R2 Datacenter	-	NOTE 1 and 2
7	Windows Server 2008 Standard SP2 (32-bit)(64-bit)	-	NOTE 2 and 3
8	Windows Server 2008 Enterprise SP2 (32-bit)(64-bit)	-	NOTE 2 and 3
9	Windows Server 2008 Datacenter SP2 (32-bit)(64-bit)	-	NOTE 2 and 3
10	Windows Server 2008 Standard (32-bit)(64-bit)	-	NOTE 2 and 3
11	Windows Server 2008 Enterprise (32-bit)(64-bit)	-	NOTE 2 and 3
12	Windows Server 2008 Datacenter (32-bit)(64-bit)	-	NOTE 2 and 3
13	Windows Server 2008 Standard SP2 without Hyper-V (32-bit)(64-bit)	-	NOTE 2, 3 and 4
14	Windows Server 2008 Enterprise SP2 without Hyper-V (32-bit)(64-bit)	-	NOTE 2, 3 and 4
15	Windows Server 2008 Datacenter SP2 without Hyper-V (32-bit)(64-bit)	-	NOTE 2, 3 and 4
16	Windows Server 2008 Standard without Hyper-V (32-bit)(64-bit)	-	NOTE 2, 3 and 4
17	Windows Server 2008 Enterprise without Hyper-V (32-bit)(64-bit)	-	NOTE 2, 3 and 4
18	Windows Server 2008 Datacenter without Hyper-V (32-bit)(64-bit)	-	NOTE 2, 3 and 4

No.	Operating system name	Required Hotfix	Remarks
19	Windows Server 2003 R2, Standard Edition SP2	-	-
20	Windows Server 2003 R2, Standard x64 Edition SP2	-	NOTE 2
21	Windows Server 2003 R2, Enterprise Edition SP2	-	-
22	Windows Server 2003 R2, Enterprise x64 Edition SP2	-	NOTE 2
23	Windows Server 2003, Standard Edition SP2	-	-
24	Windows Server 2003, Standard x64 Edition SP2	-	NOTE 2
25	Windows Server 2003, Enterprise Edition SP2	-	-
26	Windows Server 2003, Enterprise x64 Edition SP2	-	NOTE 2

NOTE 1: The Cluster Shared Volume is not supported.

NOTE 2: On 64-bit operating system, this product runs as a 32-bit application on the WOW64 (Windows 32-bit On Windows 64-bit) subsystem.

NOTE 3: The Server Core installation option is not supported.

NOTE 4: Guest OS is not supported in a Hyper-V environment.

For Solaris environment

No.	Operating system name	Remarks
1	Solaris 10	NOTE

NOTE: Operation of Solaris Containers is supported only within the global zone.

For Linux environment

No.	Operating system name	Remarks
1	Red Hat Enterprise Linux 5 (for x86)	NOTE 1
2	Red Hat Enterprise Linux 5 (for Intel64)	NOTE 1 and 2
3	Red Hat Enterprise Linux 6 (for x86)	-
4	Red Hat Enterprise Linux 6 (for Intel64)	NOTE 2 and 3
5	SUSE Linux Enterprise Server 11 Service Pack 1 for x86	-
6	SUSE Linux Enterprise Server 11 Service Pack 1 for EM64T	NOTE 2

NOTE 1: The volumes that size is larger than 2TB are not supported.

NOTE 2: Running as a 32-bit application

NOTE 3: Requires the glibc (glibc-2.12-1.7.el6.i686.rpm or later), libstdc++ (libstdc++-4.4.4-13.el6.i686.rpm or later) and libgcc (libgcc-4.4.4-13.el6.i686.rpm or later) packages.

2.5.2.2 Essential software

There is no essential software.

2.5.2.3 Incompatible software

Concurrent use with below software is not possible.

- ETERNUS SF Express

2.5.3 Required resources for installation

This section describes the resources that are required for installing AdvancedCopy Manager CCM.

2.5.3.1 Required disk space for installation

For installation of AdvancedCopy Manager CCM on a server, the required free disk space on that server is as follows:

For Windows environment

Directory name	Required disk space (Unit: MB)	Explanation
Program Directory	200	"Program Directory" as specified during installation
Environment Directory	1	"Environment Directory" as specified during installation
Work Directory	1	"Work Directory" as specified during installation

For Solaris environment

Directory name	Required disk space (Unit: MB)	Explanation
/opt	200	"Program Directory" as specified during installation
/etc/opt	1	"Environment Directory" as specified during installation
/var/opt	1	"Work Directory" as specified during installation

For Linux environment

Directory name	Required disk space (Unit: MB)	Explanation
/opt	200	"Program Directory" as specified during installation
/etc/opt	1	"Environment Directory" as specified during installation
/var/opt	1	"Work Directory" as specified during installation

2.5.4 Required resources for operation

2.5.4.1 Required disk space for operation

For operating AdvancedCopy Manager CCM, in addition to disk space described in "[2.5.3.1 Required disk space for installation](#)", the server on which it is installed must have free disk space as described below.

For Windows environment

Directory name	Required disk space (Unit: MB)	Explanation
Environment Directory	100	"Environment Directory" as specified during installation
Work Directory	100	"Work Directory" as specified during installation

For Solaris environment

Directory name	Required disk space (Unit: MB)	Explanation
/etc/opt	100	"Environment Directory" as specified during installation
/var/opt	100	"Work Directory" as specified during installation

For Linux environment

Directory name	Required disk space (Unit: MB)	Explanation
/etc/opt	100	"Environment Directory" as specified during installation
/var/opt	100	"Work Directory" as specified during installation

2.5.4.2 Required memory for operation

For operating AdvancedCopy Manager CCM, the server on which it is installed must have the following amount of memory.

For Windows environment

- 512MB

For Solaris environment

- 512MB

For Linux environment

- 512MB

Chapter 3 Installation of ETERNUS SF Manager

This chapter explains methods for installation of ETERNUS SF Manager.

3.1 Before installation

The following preparation work must be done before starting the installation of ETERNUS SF Manager.

3.1.1 Available disk space verification

Make sure that there is enough available disk space on the server where the installation will be performed.

For information on the disk space required for installation, refer to "[2.2.3.1 Required disk space for installation](#)".

If there is not enough available disk space, perform any of the following actions in order to secure the disk space required for installation:

- Increase disks
- Reconfigure the disk partitions

3.1.2 Incompatible software uninstallation

Check if any incompatible software is installed on the server where the installation will be performed.

If the incompatible software is found, refer to that software manual and uninstall it before starting the installation.

3.1.3 Symfoware confirmation

Symfoware components are bundled with ETERNUS SF Manager.

This section explains items to be checked when installing ETERNUS SF Manager on a server that already has Symfoware installed. If Symfoware is not yet installed, this task is not necessary.

For Windows environment

Check that the installed Symfoware Server is the following version level.

For any version level other than listed below, uninstall that Symfoware Server and install one that is listed.

For Windows Server 2003

- SymfoWARE Server Enterprise Edition V5.0
- Symfoware Server Enterprise Edition V6.0 - V10.x

For Windows Server 2008 or Windows Server 2008 R2

Symfoware Server and Symfoware Client are used with ETERNUS SF Manager. The configuration of the installation must be confirmed.

- When both Symfoware Server and Symfoware Client are installed:

There is no problem. They can be used simultaneously.

- When only Symfoware Server is installed:

Check if the installed Symfoware Server is "Symfoware Server Enterprise Edition V9.1.1".

When ETERNUS SF Manager is installed, Symfoware Client will also be installed.

For any version level except "Symfoware Server Enterprise Edition V9.1.1", perform either of the following tasks.

- If use the installed Symfoware Server continuously:

Install the same version of Symfoware Client as the installed Symfoware Server.

- If use the Symfoware Server bundled with ETERNUS SF Manager:

Save any necessary data, and remove the installed Symfoware Server. After installing ETERNUS SF Manager, restore the saved data.

- When only Symfoware Client is installed:

Uninstall the installed Symfoware Client.

For Solaris environment

Check that the installed Symfoware Server is the following version level.

For any version level other than listed below, uninstall that Symfoware Server and install one that is listed.

Installed Symfoware Server	Version level of Symfoware Server
32-bit	Symfoware Server Enterprise Edition 6.0 - 10.x
64-bit	Symfoware Server Enterprise Extended Edition 6.0 - 10.x



Note

It cannot be operated in the environment where Symfoware Server is introduced with standard security operations selected.

For Linux environment

Check that the installed Symfoware Server is the following version level.

For any version level other than listed below, uninstall that Symfoware Server and install one that is listed.

Operating environment	Version level of Symfoware Server
Red Hat Enterprise Linux 5 (for x86) Red Hat Enterprise Linux 5 (for Intel64)	Either version lever of the following: <ul style="list-style-type: none"> - Symfoware Server Enterprise Edition V9.x - V10.x - Symfoware Server Enterprise Extended Edition V9.x - V10.x
Red Hat Enterprise Linux 6 (for x86) Red Hat Enterprise Linux 6 (for Intel64)	Either version lever of the following: <ul style="list-style-type: none"> - Symfoware Server Enterprise Edition V10.x - Symfoware Server Enterprise Extended Edition V10.x

3.1.4 Estimation of database size

To install ETERNUS SF Manager, the following database is required.

- Repository

This is used for the managing the information of the operating environment by ETERNUS SF Manager.

For Windows environment

The following database areas are required. The following databases must reside on a drive with NTFS format.

Type	Required size
RDB log file	100MB
RDB dictionary	55MB
Repository database	Calculated value by " Formula for calculating repository database "

The required size of the repository database must be calculated by the following formula.

Formula for calculating repository database

$$\text{Required size (MB)} = \{ [(\text{Number_of_servers} * 6 + \text{Total_number_of_devices} * 11) / 40] * 17 + 512 \} / 1024$$

- *Number_of_servers*

This is the total number of Management Server and Managed Servers.
 For servers that perform the cluster operation, calculate with the number of physical nodes that compose the clustered system.

- *Total_number_of_devices*

- For AdvancedCopy Manager

This is the total number of devices (partitions) that are managed by AdvancedCopy Manager. This is not to be confused with the total number of devices that are connected to a Managed Server.

For AdvancedCopy Manager, the meaning of "device" is as follows:

OS type of Managed Server	Meaning of "device"
Windows	Partition
Solaris	Slice
Linux	Partition
HP-UX	LUN
AIX	LUN

- For Express

This is the total number of partitions. This is not to be confused with the total number of devices that are connected to a Managed Server.

If a Managed Server is mirrored by SynfinityDISK or PRIMECLUSTER Global Disk Services, the number of devices is the total number of mirror slices. The total number of mirror slices is the result of multiplying the number of devices by the number of disks composing each mirror group.

 **Point**

Cautions for calculating the disk space for the repository database:

- Round up to the integer, any fractions in the calculation results for the terms in the square brackets.
- When the calculated value is less than 65MB, use 65MB as the required size.
- If there is any possibility that the number of servers and/or devices will increase in the future, specify a larger disk space than calculated.

For Solaris/Linux environment

The following database areas are required.

Type	Required size
DB file directory	200MB
RDB log file directory	50MB
RDB dictionary directory	50MB
The directory containing the repository data storage DB	Disk space that calculated in " Formula for calculating repository database ".

Note

- The following when you store the above mentioned database in the new device.
A management block is required for operation with the file system when the file system is created. The size of the file system must be less than the size of the defined device.
The capacity of the management block is specified using the relevant option to when the file system it is created.
- Confirm that free space listed above table is secured using df command to check the capacity of the file system after creating the file system.

Formula for calculating repository database

$$\text{Required size (MB)} = \{[(\text{Number_of_servers} * 6 + \text{Total_number_of_devices} * 11) / 40] * 17 + 512\} / 1024$$

- *Number_of_servers*

This is the total number of Management Server and Managed Servers.

For servers that perform the cluster operation, calculate with the number of physical nodes that compose the clustered system.

- *Total_number_of_devices*

- For AdvancedCopy Manager

This is the total number of devices (partitions) that are managed by AdvancedCopy Manager. This is not to be confused with the total number of devices that are connected to a Managed Server.

For AdvancedCopy Manager, the meaning of "device" is as follows:

OS type of Managed Server	Meaning of "device"
Windows	Partition
Solaris	Slice
Linux	Partition
HP-UX	LUN
AIX	LUN

When the Managed Server to be managed is using mirroring with the SynfinityDISK or PRIMECLUSTER Global Disk Services, the number of devices is equivalent to the total of mirror slices.

The total number of mirror slices is the number of devices multiplied by the number of disks comprising the mirror group.

- For Express

This is the total number of partitions. This is not to be confused with the total number of devices that are connected to a Managed Server.

Note

- Although the four directories can be created on the same device, for reliability and performance considerations, we recommend preparing these directories on another partition.
- When there are two or more Management Servers, define the number to be estimated as the total number on all Management Servers.
- Round up to the integer, any fractions in the calculation results for the terms in the square brackets.
- When the calculated capacity is less than 65 MB, use 65 MB as the minimum required size.
- When the calculated capacity and the free space in the prepared partition are the same size, the directory usage rate (capacity), displayed by the df command or similar, may be 100%, but this is not a problem.

Point

If there is a possibility that the number of servers or number of partitions will be increased in future, specify a size that is greater than the estimated size.

If there is a possibility that the number of mirrors or number of devices will be increased in future and SynfinityDISK or PRIMECLUSTER Global Disk Services are used, also specify a size that is greater than the estimated size.

3.1.5 Registering the repository access user (for Solaris and Linux)

Register the user who performs the database access for repository to the operation system.

For the username and password of the database access user, confirm with a Fujitsu system engineer.

3.1.6 Kernel parameter tuning (for Solaris and Linux)

Tune the kernel parameters, which are required for operation.

3.1.6.1 Kernel parameter tuning (for Solaris)

For Solaris kernel parameters required tuning, their values, and how to set the values, refer to the following description.

Solaris 10

Solaris 10 had added the ability to set the parameter values in /etc/project file. Use either /etc/project file or /etc/system file for tuning depending on installation environment.

- Tuning using /etc/project : Refer to [Solaris 10 \(tuning using /etc/project\)](#)
- Tuning using /etc/system : Refer to [Solaris 9 and Solaris 10 \(tuning using /etc/system\)](#)

Solaris 9

- Tuning using /etc/system : Refer to [Solaris 9 and Solaris 10 \(tuning using /etc/system\)](#)

Note

If the parameters listed in Table have already been set, perform the following. For a parameter listed with a "Maximum value" in the "Standard configuration" column, specify the larger of the current value and the default value. For a parameter listed with an "Addition", specify the larger of the value obtained by adding the value shown to the default value or the current value.

Solaris 9 and Solaris 10 (tuning using /etc/system)

Table 3.1 Tuning values for Solaris kernel parameters

Resource	Parameter	Value	Standard configuration
Shared memory	shmsys:shminfo_shmmax	40000000	Maximum value
	shmsys:shminfo_shmmni	80	Addition
Semaphore	semsys:seminfo_semmni	310	Addition
	semsys:seminfo_semmns (*1)	610	Addition
	semsys:seminfo_semmnu (*1)	512	Addition
	semsys:seminfo_semmns1	35	Maximum value
Message	msgsys:msginfo_msgmax (*1)	512	Maximum value
	msgsys:msginfo_msgmnb	4096	Maximum value

Resource	Parameter	Value	Standard configuration
	msgsys:msginfo_msgmni	3	Addition
	msgsys:msginfo_msgtql	100	Maximum value

*1 Not required under Solaris 10.

Edit the kernel parameters using the following methods.

- Add the tuning record to /etc/system file.
- Change the current record value.

The procedure to edit the kernel parameter is mentioned below.

1. Use the following command to check the settings of the parameters in this table that are currently set in the system:

```
# /usr/sbin/sysdef
```

2. Refer to "[Table 3.1 Tuning values for Solaris kernel parameters](#)" for comparing the current value to the value in the table. Calculate the appropriate value to set by either adding the two values or taking the maximum value, as indicated in the table.
3. Edit the /etc/system file.

An example of editing the /etc/system file is shown below. Use suitable values for your environment.

```
set shmsys:shminfo_shmmax = 40000000
set shmsys:shminfo_shmmni = 180
set shmsys:shminfo_shmseg = 60
set semsys:seminfo_semni = 320
set semsys:seminfo_semmns = 670
set semsys:seminfo_semmnu = 542
set semsys:seminfo_semmsl = 35
set msgsys:msginfo_msgmax = 2048
set msgsys:msginfo_msgmnb = 4096
set msgsys:msginfo_msgmni = 53
set msgsys:msginfo_msgtql = 140
```

4. Reboot the system to register the new kernel parameter values in the system.

Use the following command to reboot the system:

```
# cd /
# /usr/sbin/shutdown -y -i6 -g0
```

5. Check that the new settings are applied using the following command after rebooting:

```
# /usr/sbin/sysdef
```

Solaris 10 (tuning using /etc/project)



Note

- Care is required when setting values if other software that only supports tuning using the /etc/system file is used on a server where this product is used.
- If the /etc/system file and the /etc/project file are both used for tuning, refer to the operating system documentation to set the appropriate values.
- If the /etc/project file is used for tuning, ensure that you do not set values that are lower than the Solaris default values.

ETERNUS SF Manager runs under the following project:

- system project

Project in which daemons existing in the initialized operating system status run.

- user.root project

Project to which processes operated by a root user in the initialized operating system status belong.

Table 3.2 Tuning values for resource control

Resource	Parameter	Required value	Standard configuration	Privilege level
Shared memory	project.max-shm-memory	172000000	Addition	privileged
	project.max-shm-ids	80	Addition	privileged
Semaphore	project.max-sem-ids	310	Addition	privileged
	process.max-sem-nsems	35	Maximum value	privileged
Message	process.max-msg-qbytes	4096	Maximum value	privileged
	project.max-msg-ids	3	Addition	privileged

For "privileged" in the "Privilege level" column, specify "privileged" in the /etc/project file.

Edit the /etc/project file to change the parameters.

The procedure mentioned below.

1. Check the initial values and the upper limits of the values that can be set in a system project and a user.root project, as shown below:

```
# newtask -p system
# prctl $$
NAME    PRIVILEGE    VALUE    FLAG    ACTION    RECIPIENT
process.max-port-events
privileged    65.5K    -    deny    -
system    2.15G    max    deny    -
process.max-msg-messages
privileged    8.19K    -    deny    -
system    4.29G    max    deny    -
:
zone.cpu-shares
privileged    1    -    none    -
system    65.5K    max    none    -
# newtask -p user.root
# prctl $$
NAME    PRIVILEGE    VALUE    FLAG    ACTION    RECIPIENT
process.max-port-events
privileged    65.5K    -    deny    -
system    2.15G    max    deny    -
process.max-msg-messages
privileged    8.19K    -    deny    -
system    4.29G    max    deny    -
:
zone.cpu-shares
privileged    1    -    none    -
system    65.5K    max    none    -
```

2. Refer to "Table 3.2 Tuning values for resource control" for comparing the current value to the value in the table. Calculate the appropriate value to set by either adding the two values or taking the maximum value, as indicated in the table.
3. Use the projmod command to set values for the system project and for the user.root project.

The following example shows how to edit the /etc/project file. Use suitable values for your environment.

```

# projmod -s -K 'project.max-msg-ids=(privileged,131,deny)' system
# projmod -s -K 'project.max-shm-ids=(privileged,208,deny)' system
# projmod -s -K 'project.max-sem-ids=(privileged,438,deny)' system
# projmod -s -K 'project.max-shm-memory=(privileged,270585456,deny)' system
# projmod -s -K 'project.max-msg-ids=(privileged,131,deny)' user.root
# projmod -s -K 'project.max-shm-ids=(privileged,208,deny)' user.root
# projmod -s -K 'project.max-sem-ids=(privileged,438,deny)' user.root
# projmod -s -K 'project.max-shm-memory=(privileged,270585456,deny)' user.root

```

4. Configuration information can be displayed by executing the following command:

The example for executing the confirmation command is shown below.

```

# projects -l
system
    projid : 0
    comment: ""
    users  : (none)
    groups : (none)
    attribs: project.max-msg-ids=(privileged,131,deny)
            project.max-shm-ids=(privileged,208,deny)
            project.max-sem-ids=(privileged,438,deny)
            project.max-shm-memory=(privileged,270585456,deny)
user.root
    projid : 1
    comment: ""
    users  : (none)
    groups : (none)
    attribs: project.max-msg-ids=(privileged,131,deny)
            project.max-shm-ids=(privileged,208,deny)
            project.max-sem-ids=(privileged,438,deny)
            project.max-shm-memory=(privileged,270585456,deny)
noproject
    projid : 2
    comment: ""
    users  : (none)
    groups : (none)
    attribs:
default
    projid : 3
    comment: ""
    users  : (none)
    groups : (none)
    attribs:
group.staff
    projid : 10
    comment: ""
    users  : (none)
    groups : (none)
    attribs:
#

```

5. Enable tuning of the kernel parameters.

The executing example is shown below. For details of the command, refer to Solaris manuals.

- system project

```
# newtask -p system
```

- user.root project

```
# newtask -p user.root
```

6. Confirm the changed kernel parameter value.

The executing example is shown below. For details of the command, refer to Solaris manuals.

- system project

```
# prctl -i project system
```

- user.root project

```
# prctl -i project user.root
```

3.1.6.2 Kernel parameter tuning (for Linux)

Refer to "[Table 3.3 Tuning values for Linux kernel parameters](#)" for the kernel parameters to be tuned and their values.

To edit a kernel parameter, add an entry to the /etc/sysctl.conf file or modify the current record value.



Note

- If a parameter value is not set in the /etc/sysctl.conf file, the operating system default value is used for the parameter. In such a case, make an addition or change based on the operating system default value. To display the values used by the operating system, execute the sysctl command with the "a" option. Refer to the section about the man command of the operating system for details of the sysctl command.
- For a parameter described as "Maximum value" under "Parameters already set" in the "[Table 3.3 Tuning values for Linux kernel parameters](#)" below, specify the larger value of the specified value or the default value. For a parameter listed with an "Addition", specify the larger of the value obtained by adding the value shown to the specified or default value.

Table 3.3 Tuning values for Linux kernel parameters

Resource	Parameter	Required value	Parameters already set
Shared memory	kernel.shmmax	40000000	Maximum value
	kernel.shmmni	50	Addition
Semaphore	The first value of kernel.sem (*1)	30	Maximum value
	The second value of kernel.sem (*1)	600	Addition
	The fourth value of kernel.sem (*1)	300	Addition
Message	kernel.msgmax	512	Maximum value
	kernel.msgmnb	4096	Maximum value
	kernel.msgmni	3	Addition

*1 The kernel.sem parameter has four tokens. The following shows the order of the tokens.

For the third token, use the current value or the default value.

```
kernel.sem = para1 para2 para3 para4
```

The following example shows how to edit the /etc/sysctl.conf file.

```
kernel.shmmax = 40000000
kernel.shmmni = 4200
kernel.sem = 250 32600 32 428
kernel.msgmax = 8192
kernel.msgmnb = 16384
kernel.msgmni = 18
```

Reboot the system or execute the sysctl command to apply kernel parameter tuning.

The following shows the command for rebooting the system.

```
# cd /
# /sbin/shutdown -r now
```

The following provides an entry example where the sysctl command is executed to apply the tuning.

```
# /sbin/sysctl -p /etc/sysctl.conf
```

3.1.7 Confirmation of port numbers for various communication services (for Solaris and Linux)

ETERNUS SF Manager uses the following port numbers.

Check the contents of the /etc/services file and make sure that the port numbers which are to be used by ETERNUS SF Manager are not registered.

If any service other than "Table 3.4 Communication port numbers for ETERNUS SF Manager (For Solaris and Linux environments)" is using the same port number, when installing ETERNUS SF Manager change the overlapping port number to one that does not overlap with any other service. A port number between 1024 and 65535 can be entered.

Table 3.4 Communication port numbers for ETERNUS SF Manager (For Solaris and Linux environments)

Service	Service name	Port number	Install parameter
Web Console service	esfmanagerweb	9855/tcp	ETERNUS_SF_Manager_apache_service
communication service 1	stgxfws	1226/tcp	Communications_service_1
communication service 2	sscruisera	4917/tcp	Communications_service_2
Repository service 1	rdaswstf	22004/tcp	Repository_service_1
Repository service 2	esfpostgres	15432/tcp	Repository_service_2
Remote access service	rmiswstf	9851/tcp	Remote_access_service
Exclusive control service	semswstf	9852/tcp	Exclusive_control_service
Internal use	esfmanagertomcat1	8005/tcp	Internal_port_1
	esfmanagertomcat2	8009/tcp	Internal_port_2
	esfmanagertomcat3	18443/tcp	Internal_port_3
	sscruiserm	24916/tcp	Internal_port_4
	astm	24917/tcp	Internal_port_5

3.1.8 Confirmation of OS default locale (for Solaris and Linux)

ETERNUS SF Manager supports only "C" as the operating system default locale.

If the operating system default locale of your system is other than "C", change the value to "C" before installing ETERNUS SF Manager.

3.2 Installation procedure of ETERNUS SF Manager (for Windows)

There are two methods of performing the installation of ETERNUS SF Manager for Windows.

- Default installation

The following configuration is used without the need to input any value.

- Installation destination

The "<System Drive>\ETERNUS_SF" directory is used as the base location for the Program Directory, Environment Directory and Work Directory.

- Port numbers for the various communication services

11 port numbers are used, as follows:

Table 3.5 Services and port numbers of ETERNUS SF Manager for Windows (default)

Service	Display name on the [Port Registration] screen	Used port number
Web Console service	ETERNUS SF Manager Apache service	9855
Communication service 1	Communications service 1	1226
Communication service 2	Communications service 2	4917
Repository service 1	Repository service 1	2004
Repository service 2	Repository service 2	5432
Remote access service	Remote access service	9851
Exclusive control service	Exclusive control service	9852
Internal use	Internal Port 1	8005
	Internal Port 2	8009
	Internal Port 3	8443
	Internal Port 4	24916

- Custom installation

Installation is done by entering the configuration information on the screen (installation destination, communication service port numbers).

Note

- When the user who belongs to Administrators of the domain installs the ETERNUS SF Manager in Windows Server 2008 or Windows Server 2008 R2, the Computer Browser service of Windows operating system must be started.
- Using the following services for carrying out installation requires particular caution.
 - Terminal service (via a remote desktop connection)

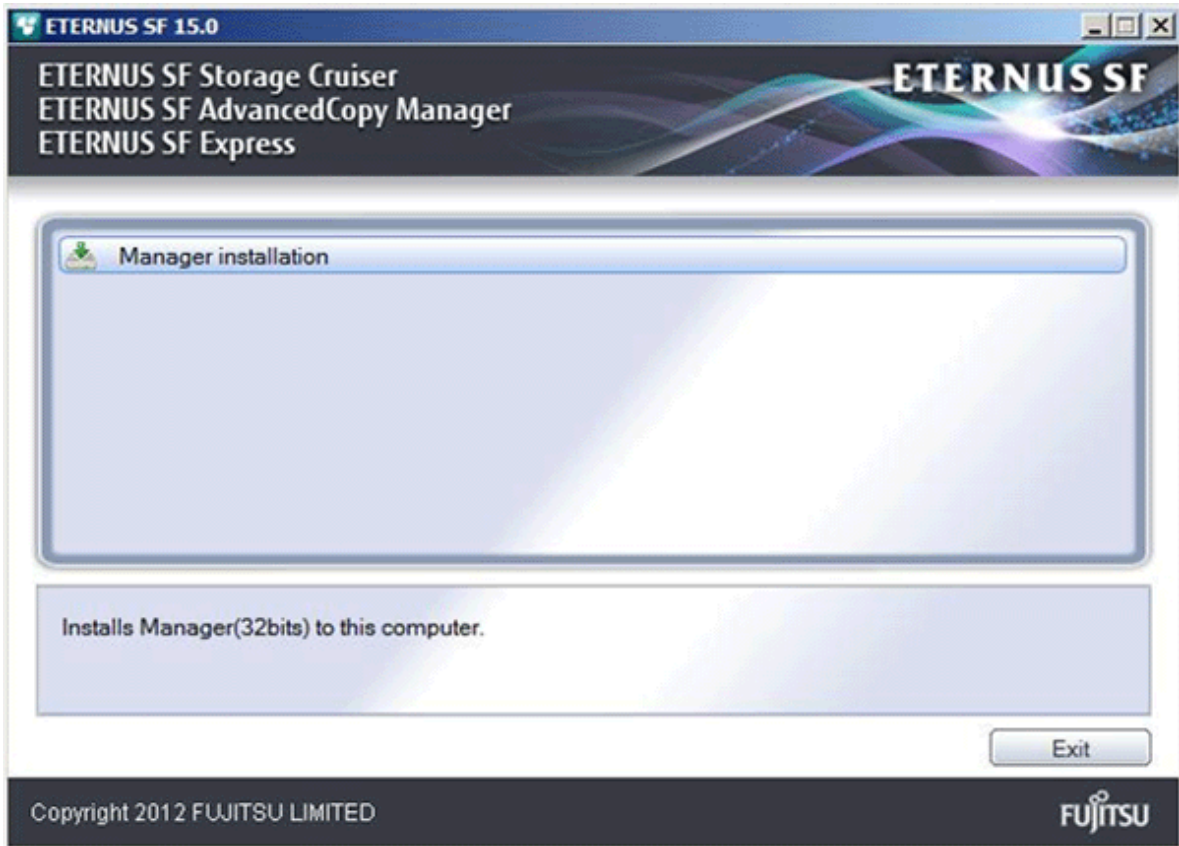
If the server is running on Windows Server 2003, the Terminal Service must connect to the console session (ID 0). Refer to the following links for information on how to make console session connections:

- <http://support.microsoft.com/kb/947723>
- <http://support.microsoft.com/kb/278845>
- Use DVD-ROM to install ETERNUS SF Manager.
Do not copy DVD-ROM contents to a local directory for installing ETERNUS SF Manager.

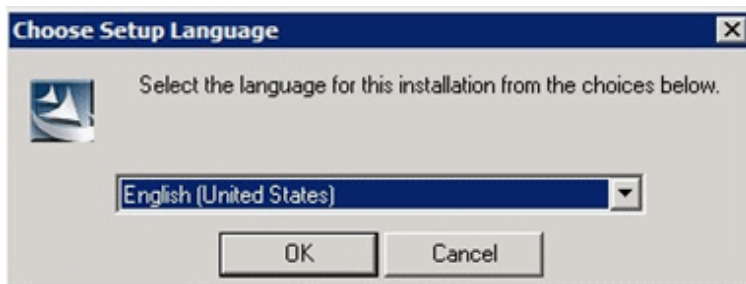
The installation procedure of ETERNUS SF Manager for Windows is performed as follows:

1. Using an account with Administrator privileges, log in the server where the installation will be performed.
2. Insert the DVD-ROM "ETERNUS SF SC/ACM/Express V15.0 Mediapack for Windows (Manager Program)" into the DVD-ROM drive.

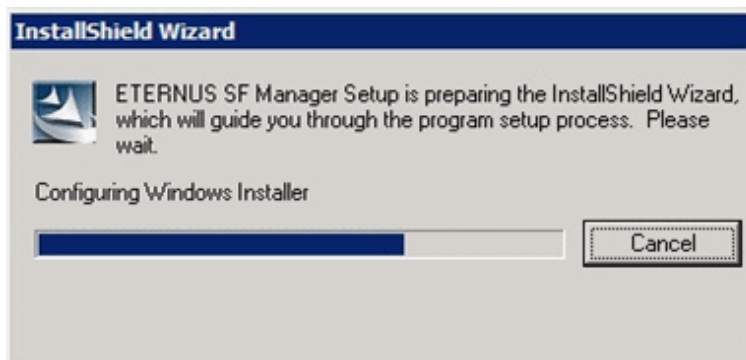
3. The following screen is displayed. Click the [Manager installation] button.
To cancel the installation at this point, click the [Exit] button.



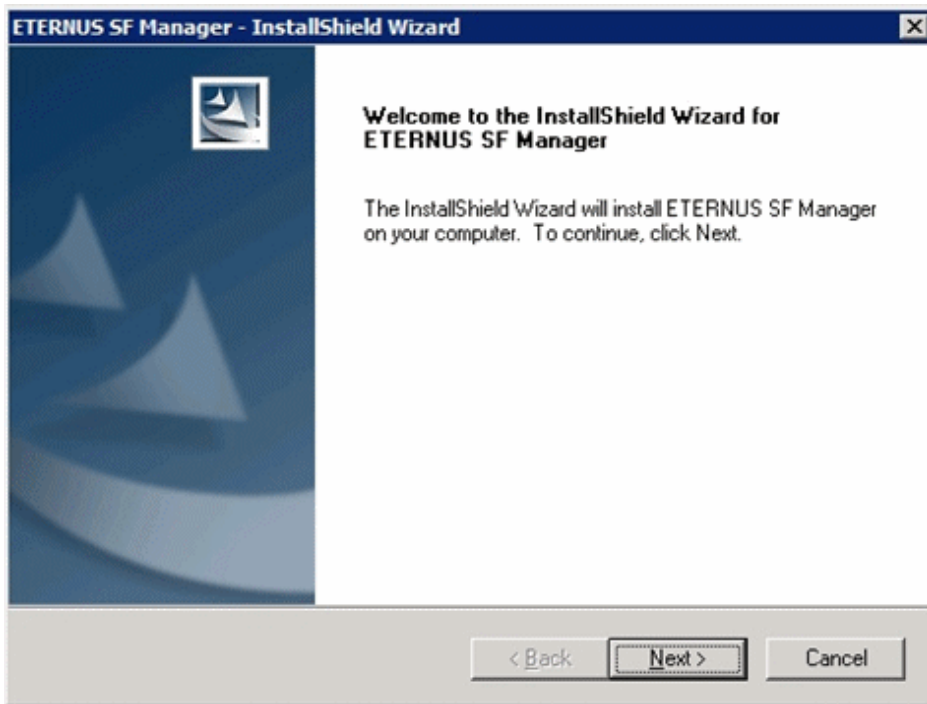
4. The [Choose Setup Language] screen is displayed. Select the language to be used for the installation and click the [OK] button.
The language selected in this screen is used during the installation, and also during the uninstallation.



5. The following screen is displayed. To cancel the installation at this stage, click the [Cancel] button.

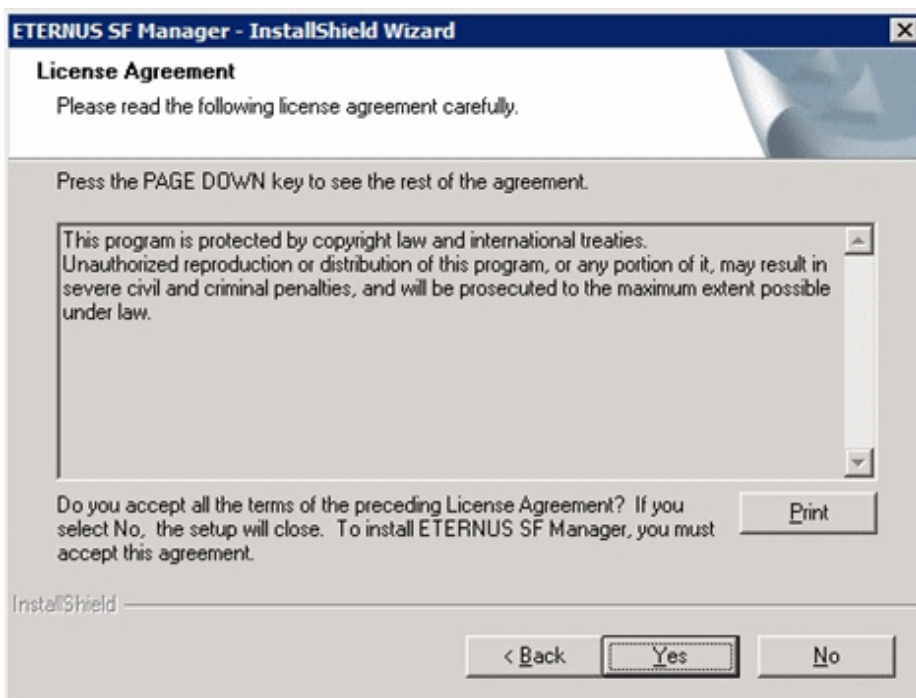


6. The following screen is displayed. After checking the screen contents, click the [Next] button.

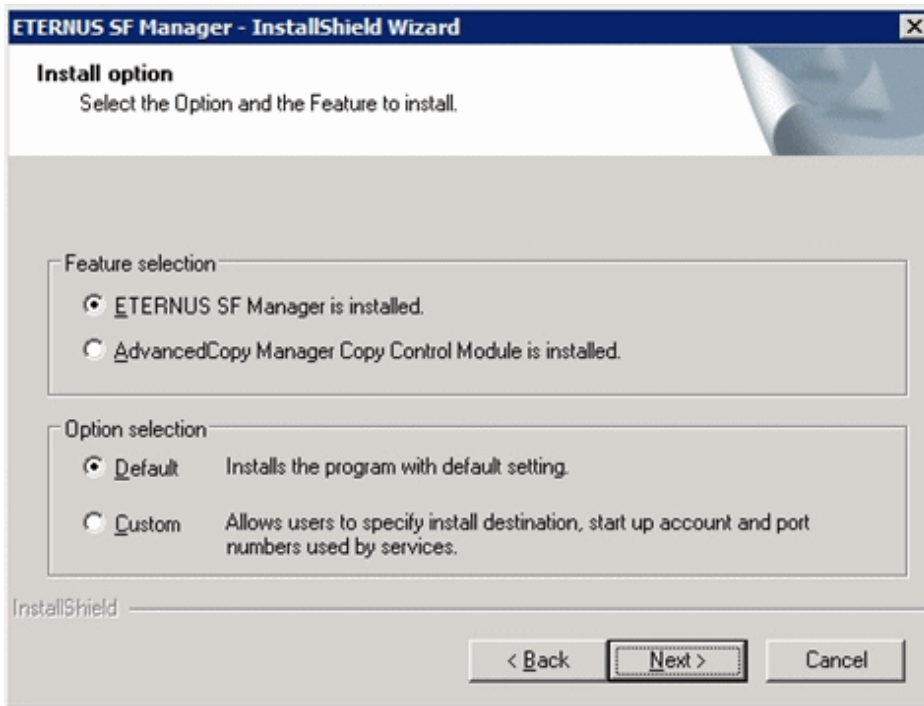


7. Read the terms and conditions in the [License Agreement] screen.

After reading the contents, if the conditions are agreed click the [Yes] button.



8. Select the functions to install and the options in the [Install option] screen.



Feature selection

Select [ETERNUS SF Manager is installed.].

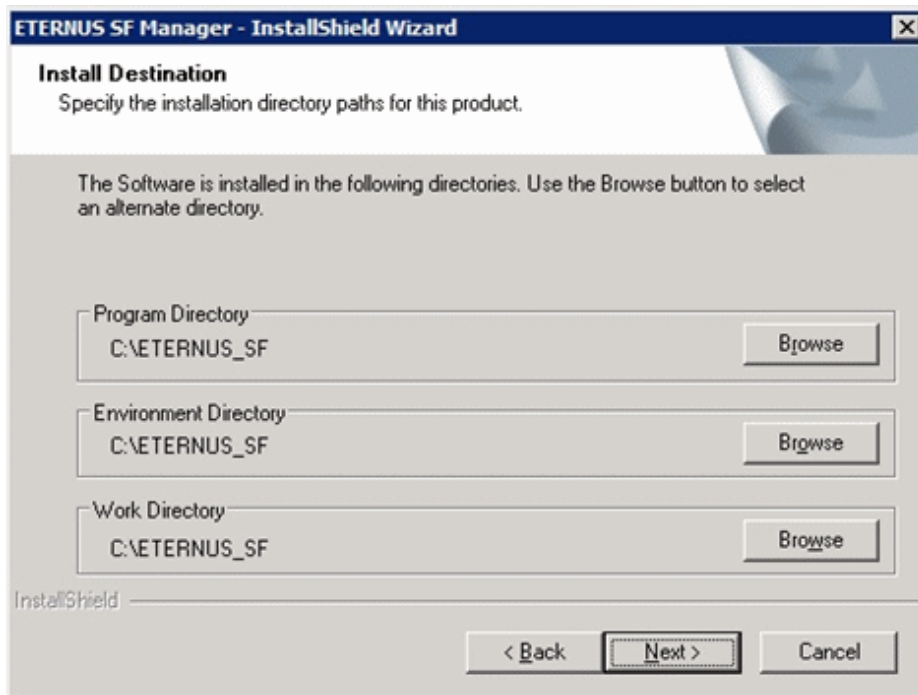
Option selection

Select the desired options according to the following information.

Install option	Explanation
Default	<p>Changing values in the [Installation Destination] screen and [Port Registration] screen is optional and can be omitted. In that case, the steps 9 and 10 can be skipped.</p> <p>In this installation method, the following checks are automatically performed regarding the information provided as a default:</p> <ul style="list-style-type: none"> - Is there enough disk space for the installation in the default directory? - Are the default port numbers available? <p>If an error is detected at this stage, a warning dialog is displayed. If no error is detected, the [Start Copying Files] screen is displayed.</p>
Custom	The installation information must be entered in the screens from step 9 and later.

9. Specify the installation directory in the [Install Destination] screen.

If installing to a directory other than the directory displayed by default, click the [Browse] button and change the install location. After designating all of the directories, click the [Next] button.



Note

- Do not specify the shared directory as the installation directory.
- The blank space and the following characters [" | : * ? / . < > , % & ^ = ! ;] cannot be used in directory names.
- The number of characters in a directory name must be between 4 and 70.

10. Specify the port number for the services in the [Port Registration] screen.

Service	Port Number
ETERNUS SF Manager Apache service	9855
Communications service 1	1226
Communications service 2	4917
Repository service 1	2004
Repository service 2	5432
Remote access service	9851
Exclusive control service	9852

For Internal Use	
Internal Port 1	8005
Internal Port 2	8009
Internal Port 3	8443
Internal Port 4	24916

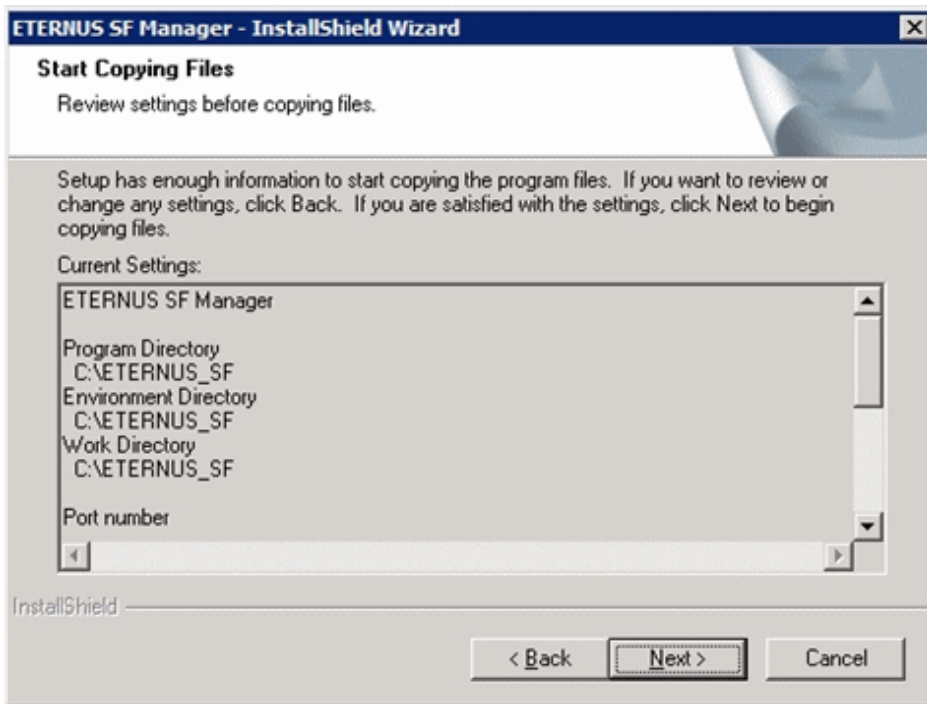
The values displayed at the screen opening are default values. If necessary, enter replacement port numbers matching your environment. Values between 5001 and 32767 are valid.

After finishing input, click the [Next] button. If one of the entered values is already in use, the input screen will be displayed again.

11. Check the settings information in the [Start Copying Files] screen.

If the settings are correct, click the [Next] button.

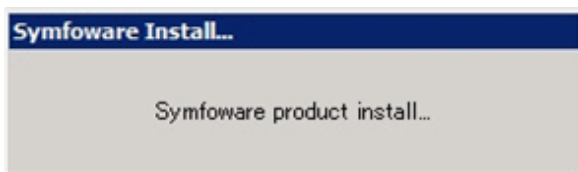
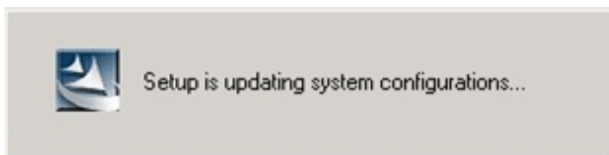
To go back and change a setting, click the [Back] button.



12. Copying the program is started.

During the process, the file copy completion status is displayed in the [Setup Status] screen.

13. Once the copy process ends, the system configuration is updated. Wait for the configuration update process to finish.



14. Enter the requested information for the repository database creation in the following screen. After the input, click the [Continue] button.

Database creation folder

This is the folder where the database will be created.

Enter the path, including the drive name, for each of the following database directories. The specified folders must be new NTFS folders. If a folder specified is not a NTFS folder or if it already exists, choose another name.

The default of the folders to store the repository database is displayed in each field. Change if necessary.

- DB log file storage location
Specify the folder for storing the RDB log file.
- DB dictionary file storage location
Specify the folder for storing the RDB dictionary file.
- Repository database space storage location
Specify the folder for storing the repository database space.

Note

- Do not specify the shared folder as the folder where the database will be created.
- The number of characters in a folder name must be between 4 and 80. The blank space and the following characters [" | : * ? / . < > , % & ^ = ! ; # ' @] cannot be used in folder names.
- Do not check the option [Compress drive to save disk space] in the **General** tab for any of these drives. Overhead is greater to a compressed drive than a non compressed drive. Depending on the amount of I/O, access errors may occur in low OS resource conditions.
- Do not check the [Compress or Encrypt Attributes] in the [Advanced Attributes] section of the [Properties] or [Advanced] part of the **General** tab. Overhead is greater to a compressed and/or encrypted drive. Access errors may occur in low OS resource conditions. If the encryption property is checked, access errors may occur when decryption cannot be performed.

Database size

The size of database to be created is entered in MB.

When using Express's manager or AdvancedCopy Manager's manager:

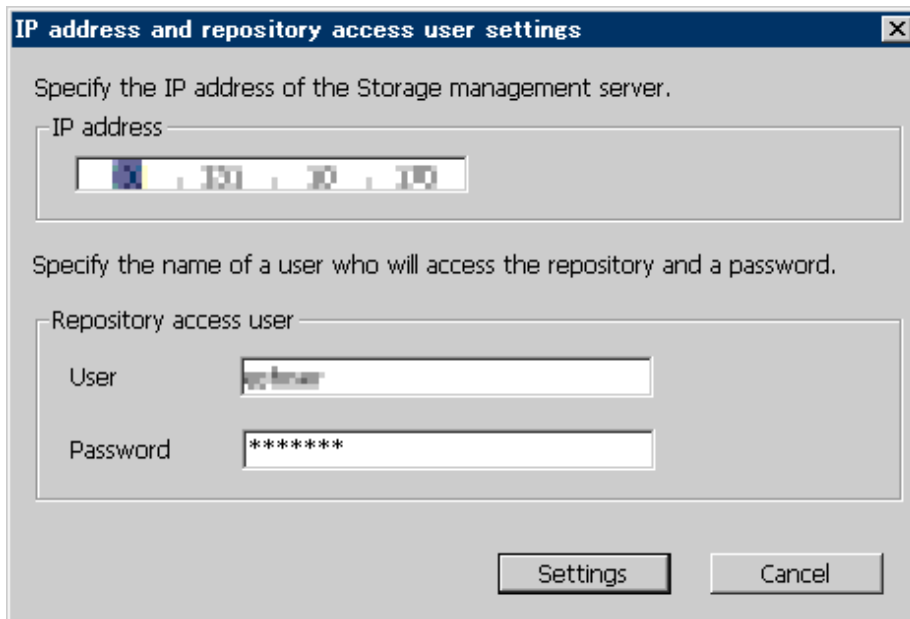
The size to enter is the result of the calculation performed before installation as described in "3.1.4 Estimation of database size". To use the default value, check the [Default size (65 MB)] check box.

When using only Storage Cruiser's manager:

Check the [Default size (65 MB)] check box.

15. The following screen is displayed for the IP address and the database user settings. Once the input is finished, click the [Settings] button.

The default value is displayed in the screen. Change if necessary.



IP address

Enter the IP address of the Management Server (own system).

Repository access user

Enter username and password for the database access user.

The users entered here must have local login or domain login permissions at the OS level.

Also, the following conditions apply for the usernames and passwords:

- Username and password must be compatible with the underlying operating system.
- Username and password must be no longer than 18 characters (bytes).

For the default value of username and password, confirm with a Fujitsu system engineer.

Note

- When Management Server has two or more IP addresses, specify IP address that can communicate to Management Server from all AdvancedCopy Manager's agents.
- When the user who belongs to Administrators of the domain installs the ETERNUS SF Manager in Windows Server 2008 or Windows Server 2008 R2, the Computer Browser service of Windows operating system must be started.

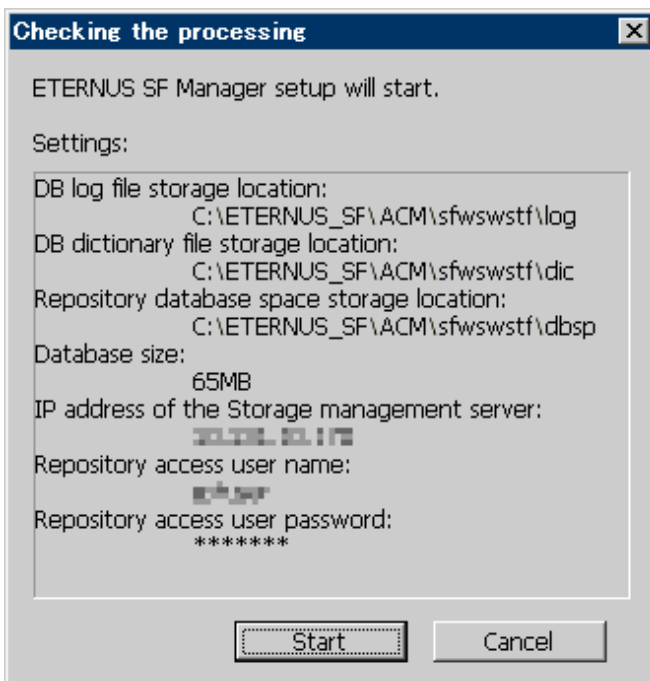


- If the user name specified here is not yet registered to the system, perform the registration, and add either local login or domain login privileges. Refer to the table below and specify a user that corresponds to the server type being used.

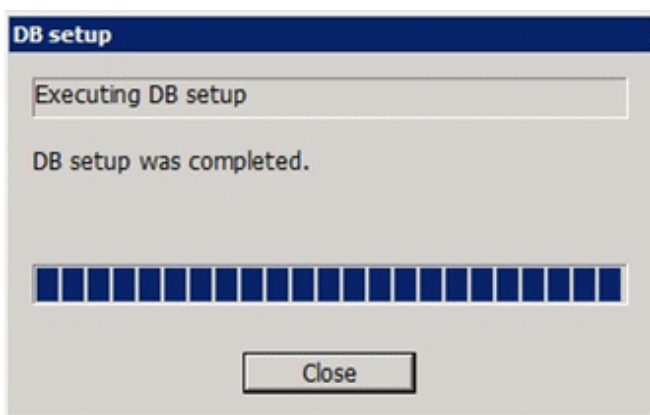
Server type	User to be specified
Domain Controller	Domain user
Machine that belongs to the domain	Local user
WORKGROUP (not belong to the domain)	

- When specifying a user name that is already registered to the system, use identical characters (e.g. uppercase and lowercase letters) to the registered user name.

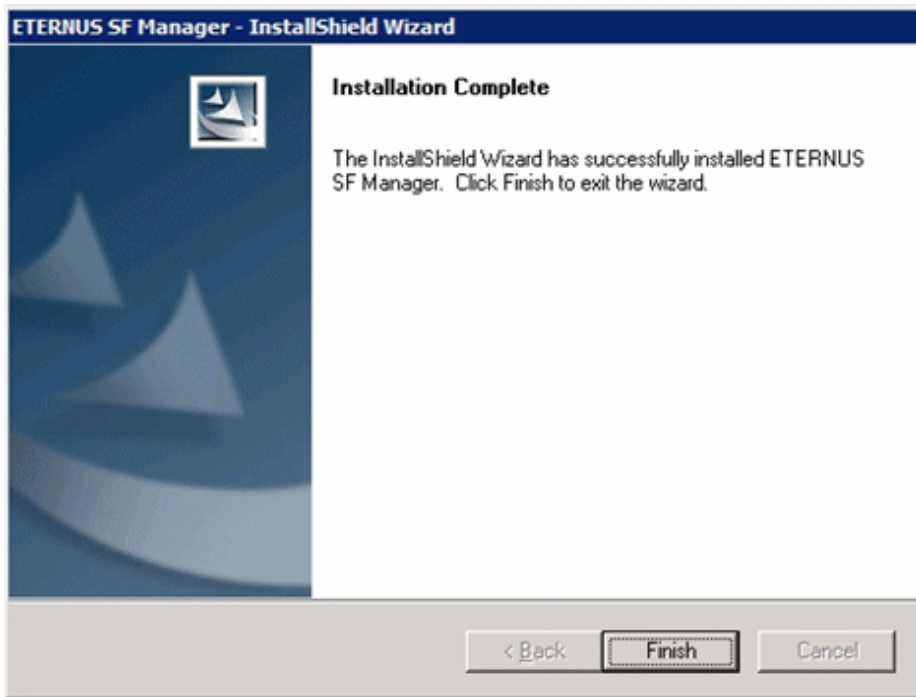
16. The following screen is displayed. Check the contents and click the [Start] button.



17. The database setup process starts. When the process is finished, the following screen is displayed. Click the [Close] button.



18. The following screen is displayed. The installation process is finished, click the [Finish] button.



19. Eject the DVD-ROM from the DVD-ROM drive.

The installation of ETERNUS SF Manager (for Windows) is completed.

3.3 Installation procedure of ETERNUS SF Manager (for Solaris)

The following two installation methods of ETERNUS SF Manager for Solaris are available:

- Default install

Install ETERNUS SF Manager by using the default value shown in "[Table 3.6 Install parameters for ETERNUS SF Manager \(for Solaris\)](#)".

- Custom install

A file which contains the information shown in "[Table 3.6 Install parameters for ETERNUS SF Manager \(for Solaris\)](#)" is referred to as "install parameter file". For custom install, character code, port number and values for DB setup in a install parameter file are changed.

Table 3.6 Install parameters for ETERNUS SF Manager (for Solaris)

Classification	Parameter	Explanation	Default value
Type of installing program	Install_function	Installing program - 1 : ETERNUS SF Manager	1
Character code	Character_code	Character code for AdvancedCopy Manager - 1 : EUC - 2 : SJIS	1
Port number	ETERNUS_SF_Manager_Apache_service	Port number for Web Console service	9855

Classification	Parameter	Explanation	Default value
	Communications_service_1	Port number for communication service 1	1226
	Communications_service_2	Port number for communication service 2	4917
	Repository_service_1	Port number for repository service 1	22004
	Repository_service_2	Port number for repository service 2	15432
	Remote_access_service	Port number for remote access service	9851
	Exclusive_control_service	Port number for exclusion control service	9852
	Internal_Port_1 Internal_Port_2 Internal_Port_3 Internal_Port_4 Internal_Port_5	Communication port number for internal use	8005 8009 18443 24916 24917
For DB setup	DB_file_directory	Directory for DB file system	/var/opt/FJSVswstf/sfswstf/db
	RDB_dictionary_directory	Directory for RDB dictionary	/var/opt/FJSVswstf/sfswstf/dic
	RDB_log_file_directory	Directory for RDB log file	/var/opt/FJSVswstf/sfswstf/log
	Repository_DB_space_directory	Directory for repository DB space	/var/opt/FJSVswstf/sfswstf/dbsp
	Repository_data_size	Repository DB size (MB)	65
	Management_server_IP_address	IP address for Management Server (Note)	None

Note : When Management Server has two or more IP addresses, specify IP address that can communicate to Management Server from all AdvancedCopy Manager's agents.

The installation procedure of ETERNUS SF Manager for Solaris is performed as follows:

Note

- Perform the following operation before installing ETERNUS SF Manager.
 - Check and make sure that the system is set to use a shadow password.
 - Register the user who performs the database access for repository to the operation system. Refer to "3.1.5 Registering the repository access user (for Solaris and Linux)" for details.
- You cannot change the install directory.

1. Log in as "root (superuser)" on the server on which to install ETERNUS SF Manager.
2. Make sure that the local file system is mounted.
If the local file system is not mounted, execute the following command to mount the local file system:

```
# /usr/sbin/mountall -l
```

3. Insert the DVD-ROM "ETERNUS SF SC/ACM V15.0 Mediapack for Solaris (Manager Program)" to the DVD-ROM drive.

4. Mount the DVD-ROM.

In the following command execution example, the device name of DVD-ROM is /dev/dsk/c0t4d0s0. Name of DVD-ROM drive is depending on the device.

```
# mount -F hsfs -o ro /dev/dsk/c0t4d0s0 <DVD-ROM mount point>
```

5. For custom install, edit the install parameter file.

The install parameter file is stored in the following directory. Copy to any directory and edit.

```
<DVD-ROM mount point>/Manager_unix/install_parameter.txt
```

6. Change directory in which the install shell is stored.

```
# cd <DVD-ROM mount point>/Manager_unix
```

7. Execute the install shell.

- For default install

```
# ./esinstall.sh
```

- For custom install

Specify absolute path name for the install parameter file which edited in step 5.

```
# ./esinstall.sh -s <absolute path name for the install parameter file>
```

8. Installation information is displayed. Display example is mentioned below.

To continue installation, enter "y". To stop the installation, enter "q".

```
+-----+
|                ETERNUS SF V15.0                |
|                |                                |
| All Rights Reserved, Copyright (C) FUJITSU LIMITED 2012 |
+-----+

Setting of installation parameter file.

Install_function:      ETERNUS SF Manager

Character_code:       EUC

Port number
  ETERNUS_SF_Manager_Apache_service: 9855
  Communications_service_1:          1226
  Communications_service_2:          4917
  Repository_service_1:              22004
  Repository_service_2:              15432
  Remote_access_service:             9851
  Exclusive_control_service:         9852
  Internal_Port_1:                   8005
  Internal_Port_2:                   8009
  Internal_Port_3:                   18443
  Internal_Port_4:                   24916
  Internal_Port_5:                   24917

Repository database setup
  DB_file_directory:                /var/opt/FJSVswstf/sfswstf/db
  RDB_dictionary_directory:         /var/opt/FJSVswstf/sfswstf/dic
  RDB_log_file_directory:           /var/opt/FJSVswstf/sfswstf/log
  Repository_DB_space_directory:    /var/opt/FJSVswstf/sfswstf/dbsp
  Repository_data_size:             65
  Management_server_IP_address:

Do you want to continue the installation? [y,q]:
```

9. After installation is completed successfully, the following message is displayed.

```
INFO: ETERNUS SF was installed successfully.
```

If an error occurs during installation, the following message is displayed and no software that configure ETERNUS SF Manager are installed.

- When port numbers are overlapping.

```
ERROR: The specified port number is duplicate with following service.:
      foo 9855/tcp
ERROR: Installation has failed.
```

Way of handling: Set the install parameter file not to overlap the port number and perform the custom install (Refer to step 7).

- When FJSVccm, for example, is already installed.

```
ERROR: The following product has been already installed on this system.:
      ETERNUS SF AdvancedCopy Manager Copy Control Module
ERROR: Installation has failed.
```

Way of handling: Uninstall the installed software (In this case, FJSVccm).

10. Change directory into other than DVD-ROM. The example is shown below.

```
# cd
```

11. Unmount the DVD-ROM.

```
# umount <DVD-ROM mount point>
```

12. Eject the DVD-ROM from the DVD-ROM drive.

Installation for ETERNUS SF Manager (for Solaris) is completed.

 **Point**

- Even after the database is created, keep using a shadow password and continue the operation.
- If an IP address for Management Server is not specified in the install parameter file, the IP address for Management Server is set automatically during the installation. After the installation is completed, change the IP address if required. For the information on how to change an IP address, refer to "Changing the IP address of Management Server" in "ETERNUS SF AdvancedCopy Manager Operation Guide (for Solaris)".
- The user information registered in "3.1.5 Registering the repository access user (for Solaris and Linux) " is set automatically as the user who performs the database access for repository. After the installation is completed, change the user information if required. For the information on how to change the user information, refer to "Change of password or deletion of the user who was specified as the repository access user" in "ETERNUS SF AdvancedCopy Manager Operation Guide (for Solaris)".

3.4 Installation procedure of ETERNUS SF Manager (for Linux)

The following two installation methods of ETERNUS SF Manager for Linux are available:

- Default install

Install ETERNUS SF Manager by using the default values shown in " [Table 3.7 Install parameters for ETERNUS SF Manager \(for Linux\)](#)".

- Custom install

A file which contains the information shown in "Table 3.7 Install parameters for ETERNUS SF Manager (for Linux) " is referred to as "install parameter file".

For custom install, character code, port number and values for DB setup in the install parameter file are changed.

Table 3.7 Install parameters for ETERNUS SF Manager (for Linux)

Classification	Parameter	Explanation	Default value
Type of installing program	Install_function	installing program - 1 : ETERNUS SF Manager	1
Character code	Character_code	Character code for AdvancedCopy Manager - 1 : UTF-8 - 2 : EUC	1
Port number	ETERNUS_SF_Manager_Apache_service	Port number for Web Console service	9855
	Communications_service_1	Port number for communication service 1	1226
	Communications_service_2	Port number for communication service 2	4917
	Repository_service_1	Port number for repository service 1	22004
	Repository_service_2	Port number for repository service 2	15432
	Remote_access_service	Port number for remote access service	9851
	Exclusive_control_service	Port number for exclusion control service	9852
	Internal_Port_1 Internal_Port_2 Internal_Port_3 Internal_Port_4 Internal_Port_5	Communication port number for internal use	8005 8009 18443 24916 24917
For DB setup	DB_file_directory	Directory for DB file system	/var/opt/FJSVswstf/sfswstf/db
	RDB_dictionary_directory	Directory for RDB dictionary	/var/opt/FJSVswstf/sfswstf/dic
	RDB_log_file_directory	Directory for RDB log file	/var/opt/FJSVswstf/sfswstf/log
	Repository_DB_space_directory	Directory for repository DB space	/var/opt/FJSVswstf/sfswstf/dbsp
	Repository_data_size	Repository DB size (MB)	65
	Management_server_IP_address	IP address for Management Server (Note)	None

Note: When Management Server has two or more IP addresses, specify IP address that can communicate to Management Server from all AdvancedCopy Manager's agents.

The installation procedure of ETERNUS SF Manager for Linux is performed as follows:

- Even after the database is created, keep using a shadow password and continue the operation.
- If an IP address for Management Server is not specified in the install parameter file, the IP address for Management Server is set automatically during the installation. After the installation is completed, change the IP address if required. For the information on how to change an IP address, refer to "Changing the IP address of Management Server" in "ETERNUS SF AdvancedCopy Manager Operation Guide (for Linux)".
- The user information registered in "3.1.5 Registering the repository access user (for Solaris and Linux) " is set automatically as the user who performs the database access for repository. After the installation is completed, change the user information if required. For the information on how to change the user information, refer to "Change of password or deletion of the user who was specified as the repository access user" in "ETERNUS SF AdvancedCopy Manager Operation Guide (for Linux)".

1. Log in as "root (superuser)" on the server on which to install ETERNUS SF Manager.

2. Make sure that the local file system is mounted.

If the local file system is not mounted, execute the following command to mount the local file system:

```
# /usr/sbin/mountall -l
```

3. Insert the DVD-ROM "ETERNUS SF SC/ACM/Express V15.0 Mediapack for Linux (Manager Program)" or "ETERNUS SF SC/ACM/Express V15.0 Mediapack for Linux 64bit (Manager Program)".

4. Mount the DVD-ROM.

```
# mount /dev/cdrom <DVD-ROM mount point>
```

5. For custom install, edit the install parameter file.

The install parameter file is stored in the following directory. Copy to any directory and edit.

```
<DVD-ROM mount point>/Manager_unix/install_parameter.txt
```

6. Change directory in which the command for installation is stored.

```
# cd <DVD-ROM mount point>/Manager_unix
```

7. Execute the install shell.

- For default install

```
# ./esinstall.sh
```

- For custom install

Specify absolute path name for the install parameter file which edited in step 5.

```
# ./esinstall.sh -s <absolute path name for the install parameter file>
```

8. Installation information is displayed.

To continue installation, enter "y". To stop the installation, enter "q".

```
+-----+
|               ETERNUS SF V15.0               |
|               |                               |
| All Rights Reserved, Copyright (C) FUJITSU LIMITED 2012 |
|               |                               |
+-----+

Setting of installation parameter file.
```

```

Install_function:      ETERNUS SF Manager

Character_code:       UTF8

Port number
ETERNUS_SF_Manager_Apache_service: 9855
Communications_service_1: 1226
Communications_service_2: 4917
Repository_service_1: 22004
Repository_service_2: 15432
Remote_access_service: 9851
Exclusive_control_service: 9852
Internal_Port_1: 8005
Internal_Port_2: 8009
Internal_Port_3: 18443
Internal_Port_4: 24916
Internal_Port_5: 24917

Repository database setup
DB_file_directory:      /var/opt/FJSVswstf/sfswstf/db
RDB_dictionary_directory: /var/opt/FJSVswstf/sfswstf/dic
RDB_log_file_directory: /var/opt/FJSVswstf/sfswstf/log
Repository_DB_space_directory: /var/opt/FJSVswstf/sfswstf/dbsp
Repository_data_size: 65
Management_server_IP_address:

Do you want to continue the installation? [y,q]:

```

9. After installation is completed successfully, the following message is displayed.

```
INFO: ETERNUS SF was installed successfully.
```

If an error occurs during installation, the following message is displayed and no software that configure ETERNUS SF Manager are installed.

- When port numbers are overlapping.

```

ERROR: The specified port number is duplicate with following service.:
       foo 9855/tcp
ERROR: Installation has failed.

```

Way of handling: Set the install parameter file not to overlap the port number and perform the custom install (Refer to step 7).

- When FJSVccm, for example, is already installed.

```

ERROR: The following product has been already installed on this system.:
       ETERNUS SF AdvancedCopy Manager Copy Control Module
ERROR: Installation has failed.

```

Way of handling: Uninstall the installed software (In this case, FJSVccm).

10. Change directory into other than DVD-ROM. The example is shown below.

```
# cd
```

11. Unmount the DVD-ROM and eject the DVD-ROM.

```
# umount /dev/cdrom
# eject cdrom
```

Installation for ETERNUS SF Manager (for Linux) is completed.

 Point

- Even after the database is created, keep using a shadow password and continue the operation.
 - If an IP address for Management Server is not specified in the install parameter file, the IP address for Management Server is set automatically during the installation. After the installation is completed, change the IP address if required. For the information on how to change an IP address, refer to "Changing the IP address of Management Server" in "ETERNUS SF AdvancedCopy Manager Operation Guide (for Linux)".
 - The user information registered in "[3.1.5 Registering the repository access user \(for Solaris and Linux\)](#)" is set automatically as the user who performs the database access for repository. After the installation is completed, change the user information if required. For the information on how to change the user information, refer to "Change of password or deletion of the user who was specified as the repository access user" in "ETERNUS SF AdvancedCopy Manager Operation Guide (for Linux)".
-

Chapter 4 Setup of ETERNUS SF Manager

This chapter explains procedures and methods for setting up ETERNUS SF Manager.

4.1 Product common settings

This section explains the settings that are common for the managers of Express, Storage Cruiser and AdvancedCopy Manager.

4.1.1 Setting up user account

Set up a user account in order to use the ETERNUS SF Manager functions.

The privileges granted to user accounts and the corresponding ranges of control are shown in the table below.

ETERNUS SF role	Administrator privilege of the operating system	
	Yes	No
Yes	Operations are possible from the Web Console and the command line.	Operations are possible only from the Web Console.
No	Operations are possible only from the command line.	Operations are neither possible from the Web Console nor from the command line.

The following section explains how to create and make settings for user accounts controlling the Web Console and for users executing commands via command input.

4.1.1.1 Creating user accounts for operating from the Web Console

For user authentication when logging in on the Web Console, ETERNUS SF product uses the authentication system of the OS on the Management Server.

In order to give a user the privilege ("role") to use ETERNUS SF product, you need to create ETERNUS SF role groups to which each user account is allocated.

The table below shows the relationships between the ETERNUS SF roles that are given to ETERNUS SF role groups and the Web Console control actions that are permitted to users belonging to the respective role group.

Table 4.1 For Windows environment

ETERNUS SF role group	ETERNUS SF role	Permitted Web Console controls
ESFAdmin	Administrator	All operations
ESFMon	Monitor	Only display-related operations

Table 4.2 For Solaris environment or Linux environment

ETERNUS SF role group	ETERNUS SF role	Permitted Web Console controls
esfadmin	Administrator	All operations
esfmon	Monitor	Only display-related operations

1. Create the following two ETERNUS SF role groups.

For Windows environment

Create the following two groups.

- ESFAdmin

- ESFMon

If using Windows domain authentication, create the ETERNUS SF role groups in the domain controller (Active Directory).
If not using Windows domain authentication, create the ETERNUS SF role groups on the Management Server.

Note

- Set the Windows security policy, to permit local logon for the ETERNUS SF role groups.
- For creating the ETERNUS SF role groups in the domain controller (Active Directory), the scope and type of each group need to be specified. Make sure to specify the following values:

Group scope : Domain local

Group type : Security

For Solaris environment or Linux environment

Create the following two groups using groupadd command and so on.

- esfadmin
- esfmon

2. Create user accounts for operating from the Web Console.

For Windows environment

If using Windows domain authentication, create user accounts in the domain controller (Active Directory).
If not using Windows domain authentication, create user accounts on the Management Server.

For Solaris environment or Linux environment

Create a user account on Management Server using useradd command and so on.

3. Assign the created user accounts to ETERNUS SF role groups.

For Windows environment

Use [Computer Management] and so on.

For Solaris environment

Configure one of the following to the target user accounts by using a command such as the usermod command.

- Set ETERNUS SF role groups as primary group.
- Add ETERNUS SF role groups to secondary group.

For Linux environment

Configure one of the following to the target user accounts by using a command such as the usermod command.

- Set ETERNUS SF role groups as main group.
- Add ETERNUS SF role groups to supplementary group.

An ETERNUS SF role is assigned to each user account.

Point

ETERNUS SF role groups can also be created via command line input. The example below shows a batch file for creating a role group. Execute the batch file on the domain controller when using Windows domain authentication. Otherwise execute the batch file on the Management Server.

```
@echo off
REM # -----
REM # Creating the ESFAdmin group
```

```

REM # -----
net localgroup ESFAdmin > NUL 2>&1
if errorlevel 1 (
    echo ESFAdmin group add.
    net localgroup ESFAdmin /add /comment:"ETERNUS SF V15 Administrator"
)

REM # -----
REM # Creating the ESFMon group
REM # -----
net localgroup ESFMon > NUL 2>&1
if errorlevel 1 (
    echo ESFMon group add.
    net localgroup ESFMon /add /comment:"ETERNUS SF V15 Monitor"
)

```

4.1.1.2 Creating user accounts for executing command

Commands for Express, Storage Cruiser, AdvancedCopy Manager and AdvancedCopy Manager CCM can only be executed by users with administrator privileges for the operating system.

This section explains how to create accounts for users who can execute commands.



Point

By assigning a user account created here to an ETERNUS SF role group, you can enable the same user to both operate from the Web Console and execute commands.

For Windows Server 2003

For using Express and AdvancedCopy Manager CCM commands on Windows Server 2003, operate as a user with Administrator permissions or a user in the Administrators group.

For Windows Server 2008 or Windows Server 2008 R2

In Windows Server 2008 and Windows Server 2008 R2, a User Account Control function (hereafter called "UAC") has been added to enhance security.

The cases where UAC is enabled and disabled are explained below.

- When UAC is enabled

When any user other than the built-in Administrator account (including accounts in the Administrator group) executes a process or program that requires administrator permissions, the "Permissions granted/authorized dialog" is displayed. Permissions granted or authorized must be confirmed.

- When UAC is disabled

Processes or programs that require administrator permissions must be executed by either the built-in Administrator account or a user account in the Administrators group.

The operating conditions are shown below.

Table 4.3 Relationship between account and UAC

Account type	UAC: Enabled	UAC: Disabled
Built-in Administrator account	A	A
User account in the Administrator group	B	A
Standard user account	B	C

- A: Runs without displaying the permissions granted dialog.
- B: Displays the permissions granted dialog, and runs if permissions are approved.
- C: Does not run, because Administrator permissions cannot be obtained.

If you do not wish to perform the dialog process using the administrator permissions dialog, and the conditions marked as "B" in the table above apply (for example, in batch processing), the program must be executed using administrator permissions with one of the following methods:

- In the Command Prompt, use "runas" command to execute the program as a user with administrator permissions. A password must be entered after this.

[Batch file (test.bat) execution example]

```
runas /noprofile /user:mymachine\acmuser "cmd.exe /k test.bat"
```

- In the Task Scheduler, specify "Execute with top level privileges" to operate the program.
- From the [Start] menu, select [All Programs]-[Accessories] and right-click on [Command Prompt]. Specify "Run as Administrator" to run the Command Prompt. Execute the program from the Command Prompt.

4.1.1.3 User account of Linux/Solaris

AdvancedCopy Manager CCM can only be executed as a root, so operate root user.

4.1.2 Setting up for using Web Console

If you set up firewalls between the PC on which the Web Console is launched and the Management Server, set the following port number so as to allow transmission to pass the firewalls.

Port number/Protocol	Communication start direction	Function
9855/tcp	From Web Console to Management Server	Screen display and operate from the Web Console

In addition, it is necessary to have JavaScript-enabled and cookie-enabled in the web browser using the Web Console.



See

.....
 For information on compatible web browsers and their versions, as well as on methods for setting to JavaScript-enabled and cookie-enabled, refer to "Operating Environment" in the "ETERNUS SF Web Console Guide".

4.1.3 Checking connection from Web Console

The settings described hereafter use the Web Console. Therefore, launch the Web Console and check that the initial screen is displayed.



See

.....
 For information on methods for launching and logging into the Web Console, refer to "Starting and Stopping Web Console" in the "ETERNUS SF Web Console Guide".

4.2 Setup of Express's manager

This section explains how to set up the ETERNUS SF Manager as the Express's manager.

4.2.1 Registering user account for using Express

Register Express users to be able to use a storage system.

With reference to the table below, create user accounts of system administrator and business administrator.

Table 4.4 Privileges given to administrator user account

Administrator	Privileges
System administrator	User with administrator privileges on the Management Server operating system. Grant the Administrator role from the ETERNUS SF roles. (Add the user account designated for administrative tasks to the ESFAdmin role group)
Business administrator	User that is registered to the Management Server operating system and manages business operation. Grant the Monitor role from the ETERNUS SF roles if performing solely for monitoring storage system or displaying status. Grant the Administrator role from the ETERNUS SF roles if permitting change the configuration or data copying. (Add the user account designated for administrative tasks to the ESFMon or ESFAdmin role group)

For details about ETERNUS SF roles, refer to "4.1.1.1 Creating user accounts for operating from the Web Console".

Note

Any user with privileges described in "Table 4.4 Privileges given to administrator user account" can use Express.
Create user accounts used only for Express to prevent unexpected users from using it.

Information

For the roles of system administrator and business administrator, refer to "Flow from Installation to Operation" in the "ETERNUS SF Express Operation Guide".

4.2.2 Configuring the network environment

If you set up firewalls between the Management Server and ETERNUS Disk storage system, set the following port numbers so as to allow transmissions to pass the firewalls.

Port number/Protocol	Communication start direction	Function
161/udp	From Management Server to ETERNUS Disk storage system	Configuration management, performance management, and polling
162/udp	From ETERNUS Disk storage system to Management Server	Fault management
1372/tcp	From Management Server to ETERNUS Disk storage system	Advanced Copy (For ETERNUS DX80 S2/DX90 S2)
50002/tcp		
1999/tcp	From Management Server to ETERNUS Disk storage system	Advanced Copy (For ETERNUS DX60/DX60 S2/DX80/DX90)

Express uses SNMP to register ETERNUS Disk storage system. Therefore, before registering devices, it is required to start SNMP Agent of ETERNUS Disk storage system. ETERNUS Disk storage system that has no SNMP Agent started cannot be registered.

Check the network environment, access privileges and settings of communication mode between Management Server and ETERNUS Disk storage system. If either communication mode of the Management Server or the ETERNUS Disk storage system is set to "Full (full duplex)", do not set the other to "Auto Negotiation".

Refer to the manual for each ETERNUS Disk storage system and check the network environment settings.

Note

- The telnet connection and the Maintenance connection should be available on the ETERNUS Disk storage system.
- There are notes in combination with products using the SNMP trap reception function.

For Windows environment

As with ServerView AlarmService, Express use OS standard SNMP trap reception service for fault management with SNMP Trap reception. Therefore, if any of the following products are mixed, take the same setting procedure as ServerView AlarmService is mixed.

- Systemwalker Centric Manager

For specific setting method, refer to each product's manual.

For Linux environment

- As with ServerView AlarmService, Express use OS standard snmptrapd of net-snmp package for fault management with SNMP Trapreception.

Therefore, if any of the following products are mixed, take the same setting procedure as ServerView AlarmService is mixed.

- Systemwalker Centric Manager All versions
- ServerView Resource Coordinator VE V2.1.1 - V2.1.3

For specific setting method, refer to each product's manual

- When uninstalling the following product in an environment mixed with it, FJSVswstt package remains
 - ServerView Resource Coordinator VE V2.1.1 - V2.1.3

Execute the following command to delete FJSVswstt package:

```
# rpm -e FJSVswstt
```

4.2.3 SNMP Trap setting

Set SNMP Trap to receive SNMP traps on the Management Server.

4.2.3.1 SNMP Trap setting (for Windows)

Install a Windows standard SNMP Trap receiver service as follows:
These services are included in the install media of OS.

- SNMP Trap Service (for Windows Server 2003)
- SNMP Trap (for Windows Server 2008)

4.2.3.2 SNMP Trap setting (for Linux)

Install OS standard net-snmp package.

When installing net-snmp package, lm-sensors package may be required. These packages provide in OS installation media.
Edit the setup file for snmptrapd after ETERNUS SF Manager installation.

Note

- Create text file (snmptrapd.conf) in /etc/snmp directory when /etc/snmp/snmptrapd.conf doesn't exist.
- For Express, be sure to set /etc/snmp/snmptrapd.conf as follows:

```
forward default unix:/var/opt/FJSVssmgr/trap_socket
```

- Normally, the snmptrapd configuration file indicates /etc/snmp/snmptrapd.conf. However other products may use /usr/share/snmp/snmptrapd.conf. Therefore, in this procedure, check both /etc/snmp/snmptrapd.conf and /usr/share/snmp/snmptrapd.conf. for coexisting with other products.
- If /usr/share/snmp/snmptrapd.conf is not used on other products, then disable access control by adding "disableAuthorization yes" to "/etc/snmp/snmptrapd.conf".

.....

Edit the snmptrapd configuration file, according to the following procedure.

1. Confirm that snmptrapd is enabled by executing the following command:

```
# chkconfig --list snmptrapd
snmptrapd 0:off 1:off 2:on 3:on 4:on 5:on 6:off
```

If snmptrapd is disabled, execute the following command to enable snmptrapd:

```
# chkconfig --add snmptrapd
# chkconfig snmptrapd on
```

2. Confirm snmptrapd access control.

The setup varies depending on the access control setup status.

Check the content of the snmptrapd.conf and if the following is set, access control is disabled.

```
disableAuthorization yes
```

- When access control is disabled.

Add the following content to /etc/snmp/snmptrapd.conf. SNMP trap reception is set.

```
forward default unix:/var/opt/FJSVssmgr/trap_socket
```

- When access control is enabled.

Add the following lines in snmptrapd.conf.

```
authCommunity net public
authCommunity net SANMA
forward default unix:/var/opt/FJSVssmgr/trap_socket
```

Check both /etc/snmp/snmptrapd.conf and /usr/share/snmp/snmptrapd.conf, and edit snmptrapd.conf in which autoCommunity has been set by other products.

If autoCommunity is not set in either file, edit /etc/snmp/snmptrapd.conf.



Information

.....

- authCommunity is an editable item when access control is enabled.

The format is as follows:

```
authCommunity TYPES COMMUNITY [SOURCE [OID | -v VIEW ]]

TYPES: log,execute,net
COMMUNITY: SNMP trap community name for a device to be monitored
```

Set log, execute and net in the TYPES field.

Set the SNMP trap community name for a device to be monitored, in the COMMUNITY field.

Do not set SOURCE, OID and VIEW fields for Express.

For example, set as follows:

```
authCommunity net public
authCommunity net SANMA
```

- If an ETERNUS Disk storage system with an SNMP trap community name other than "public" or "SANMA" is to be monitored, add an authCommunity setting.

For example, if an ETERNUS Disk storage system to be monitored has the community name "common", set this parameter as below. Note that the "public" and "SANMA" settings are mandatory.

```
authCommunity net public
authCommunity net SANMA
authCommunity net common
forward default unix:/var/opt/FJSVssmgr/trap_socket
```

- If authCommunity log or authCommunity execute has already been set by another product, add a comma and "net". For example, if authCommunity execute public is already set, set it as follows:

```
authCommunity execute,net public
authCommunity net SANMA
forward default unix:/var/opt/FJSVssmgr/trap_socket
```

3. Reflect the configuration file.

After having changed the snmptrapd.conf, execute the following commands to restart snmptrapd:

The changed content is reflected to the SNMP trap configuration.

```
# /etc/init.d/snmptrapd stop
# /etc/init.d/snmptrapd start
```

Note

After having edited snmptrapd.conf, if you have installed or uninstalled applications using snmptrapd (ServerView AlarmService, etc.) or have changed the configuration, make sure whether the content edited in the snmptrapd.conf is not changed.

Point

In an environment using ServerView trap transfer program, execute the following commands to restart:

```
# /etc/init.d/snmptrapd stop
# /etc/init.d/trpsrvd stop
# /etc/init.d/snmptrapd start
# /etc/init.d/trpsrvd start
```

4.2.4 Registering disk storage system

Using the Web Console, it is necessary to register ETERNUS Disk storage system to be used.

The following procedure is required to register the target ETERNUS Disk storage system. This procedure should be performed by the system administrator.

1. Execute the following preparations for each ETERNUS Disk storage system to be registered.

Using the ETERNUS Web GUI, perform the following settings. For details on each setting, refer to the ETERNUS Web GUI manual.

- Check the IP address of the Management Server.

If there is a Management Server on a subnet different from the subnet for which ETERNUS Disk storage system is set up, check that the IP address of the Management Server is registered to the "Allowed IP List" in the [Set Network Environment] screen on the ETERNUS Web GUI.

If it is not registered to the list, register the IP address of the Management Server to the "Allowed IP List".

- Enable the SNMP function of MNT port on the [Setup SNMP Agent (Basic Interface)] screen.
- Check the ETERNUS Disk storage system name displayed in the **Name** column on the [Modify Storage System Name] screen. When using Advanced Copy functions, specify 16 or less alphanumeric characters for ETERNUS Disk storage system name.
- If you connect iSCSI, specify "Enable" the use of iSNS server in the target port.

For ETERNUS DX80 S2/DX90 S2, additionally perform the following settings:

- On the [Create SSH Server Key] screen of the ETERNUS Web GUI, create a new SSH server key. The number of bits for the key is at your discretion.
- On the [Setup User Account] screen of the ETERNUS Web GUI, create a Software Role Account. In later procedures, specify the account information you created here.
- If an SNMP community name is not already set in the ETERNUS Disk storage system, set an SNMP community name on the [Setup SNMP Community] screen of the ETERNUS Web GUI.

2. Launch the Web Console, and then register the target ETERNUS Disk storage system.



See

For details about the procedure, refer to "Registration of ETERNUS Disk storage system" in the "ETERNUS SF Web Console Guide".

4.2.5 Setting PATH environment variable

For using Advanced Copy functions, add the "bin" directory of AdvancedCopy Manager CCM to the PATH environment variable.

For Windows environment

- For Windows Server 2003:

1. Right-click on [My Computer] on the [Start] menu, and select the [Properties] from the pop-up menu.
2. Click [Advanced] tab in the [System Properties] dialog, and then click the [Environment Variables] button.
3. Add the following value to PATH environment variable.

```
<Installation directory of ETERNUS SF Manager>\CCM\bin
```

- For Windows Server 2008 or Windows Server 2008 R2:

1. Right-click on [Computer] on the [Start] menu, and select the [Properties] from the pop-up menu.
2. Click [Advanced system settings] on the left side of [System] dialog.
3. Click [Advanced] tab in the [System Properties] dialog, and then click the [Environment Variables] button.

4. Add the following value to PATH environment variable.

```
<Installation directory of ETERNUS SF Manager>\CCM\bin
```

Point

When listing multiple directories, separate them with semicolons (;).

For Linux environment

When using Bourne shell, add a value to PATH environment variable as below.

```
# PATH=$PATH:/opt/FJSVccm/bin
# export PATH
```

Point

When listing multiple directories, separate them with colons (:).

4.3 Setup of Storage Cruiser's manager

This section explains how to set up the ETERNUS SF Manager as the Storage Cruiser's manager.

4.3.1 Configuring the network environment

If you set up firewalls between the Management Server and Managed Servers, as well as between the Management Server and an ETERNUS Disk storage system, set the following port numbers so as to allow transmissions to pass the firewalls.

Port number/Protocol	Communication start direction	Function
4917/tcp	From Management Server to Managed Server	For communication
161/udp	From Management Server to ETERNUS Disk storage system	Configuration management, performance management, and polling
162/udp	From ETERNUS Disk storage system to Management Server	Fault management

Note

- For registering a license to ETERNUS Disk storage system, enable the ssh connection or the telnet connection in setting up interface on the ETERNUS Disk storage system.
Available types of connections vary with the model of ETERNUS Disk storage system. For details, refer to Note in "[B.3 Operation of license management function](#)".
- To start Storage Cruiser's manager, map the host name of Storage Cruiser's manager to the corresponding IP address of it for host name resolution. There are methods to map them such as registering them to DNS or describing them in hosts file.

4.3.2 Registering Storage Cruiser license

The Storage Cruiser licenses must be registered for each of the ETERNUS Disk storage systems managed in Storage Cruiser.

For information on licenses and their respectively available functions, refer to "[B.1 Types of license](#)".

For information on how to register licenses, refer to "[B.3.1 Registration of license](#)".

Point

There are two methods to register licenses, i.e. the Web Console and command.

To be able to use the Web Console, the ETERNUS Disk storage system must be registered in Storage Cruiser beforehand. For information on how to register the ETERNUS Disk storage system, refer to "[4.2.4 Registering disk storage system](#)".

By using command, the license can be registered on ETERNUS Disk storage system that is not registered in Storage Cruiser.

4.3.3 SNMP Trap setting

Set SNMP Trap to receive SNMP traps on the Management Server

4.3.3.1 SNMP Trap setting (for Windows)

Install a Windows standard SNMP Trap receiver service as follows:

These services are included in the install media of OS.

- SNMP Trap Service (for Windows Server 2003)
- SNMP Trap (for Windows Server 2008)

Note

Notes in combination with products using the SNMP trap reception function

As with ServerView AlarmService, Express use OS standard SNMP trap reception service for fault management with SNMP Trap reception. Therefore, if any of the following products is mixed, take the same setting procedure as ServerView AlarmService is mixed.

- Systemwalker Centric Manager

For specific setting method, refer to each product's manual.

4.3.3.2 SNMP Trap setting (for Linux)

Customize the snmptrapd configuration file that is in the OS standard net-snmp package to receive SNMP trap in Management Server.

Check snmptrapd status

Check if snmptrapd is activated with the following command:

```
# chkconfig --list snmptrapd
snmptrapd 0:off 1:off 2:on 3:on 4:on 5:on 6:off
```

If snmptrapd is not activated, execute the following command to activate it:

```
# chkconfig --add snmptrapd
# chkconfig snmptrapd on
```

Point

The snmptrapd file is located at /etc/snmp/snmptrapd.conf, but the file /usr/share/snmp/snmptrapd.conf is also used in some other products. Check the settings in both files to ensure they are correct for the sake of coexistence with other products.

Check access control settings

Check the status of the access control settings.

If the following setting is not in snmptrapd.conf, access control is enabled:

```
disableAuthorization yes
```

Note

- Check the status of access control settings for both /etc/snmp/snmptrapd.conf and /usr/share/snmp/snmptrapd.conf.
- If there are no requests from other products, set the above "disableAuthorization yes" in /etc/snmp/snmptrapd.conf to disable access control.

SNMP trap reception settings (if access control is disabled)

Add the following setting to /etc/snmp/snmptrapd.conf:

```
forward default unix:/var/opt/FJSVssmgr/trap_socket
```

SNMP trap reception settings (if access control is enabled)

Add the following setting:

```
authCommunity net public
authCommunity net SANMA
forward default unix:/var/opt/FJSVssmgr/trap_socket
```

Note

- Check both /etc/snmp/snmptrapd.conf and /usr/share/snmp/snmptrapd.conf, and edit the snmptrapd.conf in which authCommunity has been set by other products. If it is not set in either file, edit /etc/snmp/snmptrapd.conf.
- If a device with an SNMP trap community name other than "public" or "SANMA" is to be monitored, add an authCommunity setting.
For example, if a device to be monitored has the community name "common", set this parameter as below. Note that the "public" and "SANMA" settings are mandatory.

```
authCommunity net public
authCommunity net SANMA
authCommunity net common
forward default unix:/var/opt/FJSVssmgr/trap_socket
```

- If authCommunity log or authCommunity execute has already been set by another product, add a comma and "net".
For example, if authCommunity execute public is already set, set it as follows:

```
authCommunity execute,net public
authCommunity net SANMA
forward default unix:/var/opt/FJSVssmgr/trap_socket
```

Reflect the configuration file

After having changed the `snmptrapd.conf`, execute the following commands to restart `snmptrapd`:
The changed content is reflected to the SNMP trap configuration.

```
# /etc/init.d/snmptrapd stop
# /etc/init.d/snmptrapd start
```

Note

After having edited `snmptrapd.conf`, if you have installed or uninstalled applications using `snmptrapd` (ServerView AlarmService, etc.) or have changed the configuration, make sure whether the content edited in the `snmptrapd.conf` is not changed.

Point

In an environment using ServerView trap transfer program, execute the following commands to restart:

```
# /etc/init.d/snmptrapd stop
# /etc/init.d/trpsrvd stop
# /etc/init.d/snmptrapd start
# /etc/init.d/trpsrvd start
```

Note

If ServerView AlarmService or any other application that uses `snmptrapd` has been installed, uninstalled, or had its settings changed after `snmptrapd.conf` has been customized, check that these procedures have not changed the customized content of `snmptrapd.conf`.

See

Refer to "snmptrapd.conf Configuration File" in the "Storage Cruiser Operation Guide" for details of `snmptrapd.conf`.

4.3.3.3 SNMP Trap setting (for Solaris)

There are no specific settings for receiving the SNMP trap in Management Server.

Note

This software can be used in the mixed environment with the following software. When uninstalled, the SNMP Trap monitoring daemon may be stopped.

- Systemwalker Centric Manager Management Server
- Systemwalker Centric Manager Section control server
- Systemwalker Network Assist
- Systemwalker Network Topology Manager

When above software is uninstalled in the mixed environment, execute the following commands:

1. Check if `nwsnmp-trapd` is running by executing the following command:

```
# /bin/ps -ef | grep nwsnmp-trapd
```

2. If nwsnmp-trapd is not running, reboot the system or execute the following commands:

```
# /opt/FJSVswstt/bin/mpnm-trapd stop
# /opt/FJSVswstt/bin/mpnm-trapd start
```

4.3.4 Setting up End to End list display for Hyper-V(Windows environment only)

To display the End to End list for the VM guest on the Hyper-V host, set up the Management Server with referring to "End to End list display" in "ETERNUS SF Storage Cruiser Operation Guide".

4.4 Setup of AdvancedCopy Manager's manager

This section explains how to set up the ETERNUS SF Manager as the AdvancedCopy Manager's manager for using Agent-based operating model.

For information on the setup for Agent-less operating model, refer to "[Chapter 8 Setup of AdvancedCopy Manager CCM](#)".

4.4.1 Configuring the network environment

If you set up firewalls between the Management Server and Managed Servers, as well as between the Management Server and an ETERNUS Disk storage system, set the following port numbers so as to allow transmissions to pass the firewalls.

Port number/Protocol	Communication start direction	Function
1226/tcp	From Management Server to Managed Server From Managed Server to Management Server From Managed Server to Managed Server	For communication
X/tcp	From Management Server to Managed Server From Managed Server to Management Server From Managed Server to Managed Server	For communication on the clustered system

X: Any number can be specified.



Note

For registering a license to ETERNUS Disk storage system, enable the ssh connection or the telnet connection in setting up interface on the ETERNUS Disk storage system.

Available types of connections vary with the model of ETERNUS Disk storage system. For details, refer to Note in "[B.3 Operation of license management function](#)".

4.4.2 Registering AdvancedCopy Manager license

Using the command of the license management function, the AdvancedCopy Manager licenses must be registered for each of ETERNUS Disk storage systems managed in AdvancedCopy Manager.

For information on licenses and their respectively available functions, refer to "[B.1 Types of license](#)".

For information on how to register licenses, refer to "[B.3.1 Registration of license](#)".



There are two methods to register licenses, i.e. the Web Console and command. To be able to use the Web Console, the ETERNUS Disk storage system must be registered in AdvancedCopy Manager beforehand. For information on how to register the ETERNUS Disk storage system, refer to "4.2.4 Registering disk storage system".

4.4.3 Advanced Copy Settings

It is necessary to configure the copy table size of Advanced Copy for each of ETERNUS Disk storage systems managed in AdvancedCopy Manager.

For details on the operation procedures, refer to "Configuring the copy table size" in the "ETERNUS SF Web Console Guide".

4.4.4 Path settings for Remote Advanced Copy

When the REC is performed using AdvancedCopy Manager, it is necessary to set the REC path for all of ETERNUS Disk storage systems which the REC is performed.

For details on the operation procedures, refer to "Configuring the REC path" in the "ETERNUS SF Web Console Guide".

4.5 Setup of various information

This section explains the settings for the following information to be managed by ETERNUS SF Manager.

After the completion of the manager setting, perform the following information setting by using the Web Console.

- History information
 - Operation history
 - Events
 - Login/Logout history
 - Threshold monitoring alarm
- Screen refresh information
 - Screen refresh interval
- Session information
 - session timeout

The following section explains the settings for each type of information.

4.5.1 Setting for history information

Set the number of days and capacity to retain the following four history information that is collected by ETERNUS SF Manager.

- Operation history
- Events
- Login/Logout history
- Threshold monitoring alarm

For the method of settings, refer to "Changing parameters for history information" in the "ETERNUS SF Web Console Guide".



Since Express and AdvancedCopy Manager do not support threshold monitoring, settings for information on threshold monitoring alarm cannot be made.

4.5.2 Setting for screen refresh information

Set the interval for automatic refreshment of the Web Console screen.

For the method of settings, refer to "Changing the screen refresh interval" in the "ETERNUS SF Web Console Guide".

4.5.3 Setting for session information

Set the session timeout time.

For the method of settings, refer to "Changing the session timeout value" in the "ETERNUS SF Web Console Guide".

4.5.4 Settings for event notification e-mails

Any trouble occurring on any device managed by ETERNUS SF Manager is indicated as an event. Administrators can be notified of events by e-mail.

For receiving event notifications by e-mail, the contact e-mail address must be set by using the Web Console.

For the method of settings, refer to "Displaying and changing the contact destination information" in the "ETERNUS SF Web Console Guide".

After setting the contact e-mail address, use the Web Console to send a test e-mail and check whether it arrives at the specified e-mail address.

For the method of sending a test e-mail, refer to "Sending test e-mail" in the "ETERNUS SF Web Console Guide".

Chapter 5 Installation of ETERNUS SF Agent

ETERNUS SF Agent has the following two types of agents:

- Storage Cruiser's agent
- AdvancedCopy Manager's agent

This chapter explains methods for installation of each agent.

5.1 Installation of Storage Cruiser's agent

This section explains how to install Storage Cruiser's agent.

5.1.1 Before installation

The following preparation work must be done before starting the installation of Storage Cruiser's agent.

5.1.1.1 Available disk space verification

Make sure that there is enough available disk space on the server where the installation will be performed.

For information on the disk space required for installation, refer to "[2.3.3.1 Required disk space for installation](#)".

If there is not enough available disk space, perform either of the following actions in order to secure the disk space required for installation:

- Increase disks
- Reconfigure the disk partitions

5.1.1.2 Previous version level and incompatible software uninstallation

Check if Storage Cruiser at older version level or any incompatible software is installed on the server where the installation will be performed.

If found, refer to the following manual and uninstall it before starting the installation.

About the incompatible software for Storage Cruiser's agent, refer to "[2.3.2.3 Incompatible software](#)".

software to be uninstalled	Reference manual
Incompatible software	Manual for incompatible software

Check the installation progress for older version level Storage Cruiser using the following method:

For Windows environment

From the Control Panel, open the following screen to check whether components of an older version level of Storage Cruiser are displayed. If any component of Storage Cruiser is displayed, confirm the version level.

OS type	Name of screen to be opened
Windows Server 2003	Add or Remove Programs
Windows Server 2008	Programs and Features

For Solaris environment

Perform the following procedure.

1. Log in as "root (super user)" on the server on which to install Storage Cruiser's agent.
2. Insert the DVD-ROM "ETERNUS SF SC/ACM V15.0 Mediapack (Agent Program and Manual)" into the DVD-ROM drive and mount the DVD-ROM.

In below example of command execution, the device name of the DVD-ROM drive is mounted as /dev/dsk/c0t4d0s0. The device name for the DVD-ROM drive, however, may be different for your particular device.

```
# mount -F hsfs -o ro /dev/dsk/c0t4d0s0 <DVD-ROM mount point>
```

3. Execute the following command:

```
# cd <DVD-ROM mount point>/Agent_unix/Storage_Cruiser/agent/Solaris
# ./scagtinstall.sh -check
```

If there is any incompatible software installed, you will be notified by a corresponding message.
If this output states a Storage Cruiser's agent package, check the version level.

For Linux environment

Perform the following procedure.

1. Log in as "root (super user)" on the server on which to install Storage Cruiser's agent.
2. Insert the DVD-ROM "ETERNUS SF SC/ACM/Express V15.0 Mediapack (Agent Program and Manual)" into the DVD-ROM drive and mount the DVD-ROM.

In below example of command execution, the device name of the DVD-ROM drive is mounted as /dev/cdrom. The device name for the DVD-ROM drive, however, may be different for your particular device.

```
# mount /dev/cdrom <DVD-ROM mount point>
```

3. Execute the following command:

```
# cd <DVD-ROM mount point>/Agent_unix/Storage_Cruiser/agent/Linux
# /bin/sh ./scagtinstall.sh -check
```

If there is any incompatible software installed, you will be notified by a corresponding message.
If this output states a Storage Cruiser's agent package, check the version level.

For HP-UX environment

Perform the following procedure.

1. Log in as "root (super user)" on the server on which to install Storage Cruiser's agent.
2. Execute the following command to launch the daemon required for this task:

```
# /usr/sbin/pfs_mountd &
# /usr/sbin/pfsd &
```

3. Insert the DVD-ROM "ETERNUS SF SC/ACM/Express V15.0 Mediapack (Agent Program and Manual)" into the DVD-ROM drive and mount the DVD-ROM.

In below example of command execution, the device name of the DVD-ROM drive is mounted as /dev/dsk/c1t2d0. The device name for the DVD-ROM drive, however, may be different for your particular device.

- For earlier than v11.23:

```
# /usr/sbin/pfs_mount -t rrip -x unix /dev/dsk/clt2d0 <DVD-ROM mount point>
```

- For v11.23 or later:

```
# mount -F cdfs /dev/dsk/clt2d0 <DVD-ROM mount point>
```

4. Execute the following command:

```
# /usr/sbin/swlist | /usr/bin/grep FJSVssage
```

If this output states a Storage Cruiser's agent package, check the version level.

For VMware environment

Perform the following procedure.

1. Log in as OS administrator (root) on the server (Service Console of VMware ESX Server) on which to install the Storage Cruiser's agent.
2. Insert the DVD-ROM "ETERNUS SF SC/ACM/Express V15.0 Mediapack (Agent Program and Manual)" into the DVD-ROM drive and mount the DVD-ROM.

In below example of command execution, the device name of the DVD-ROM drive is mounted as /dev/cdrom. The device name for the DVD-ROM drive, however, may be different for your particular device.

```
# mount /dev/cdrom <DVD-ROM mount point>
```

3. Execute the following command:

```
# cd <DVD-ROM mount point>/Agent_unix/Storage_Cruiser/agent/Linux  
# ./scagtinstall.sh -check
```

If there is any incompatible software installed, you will be notified by a corresponding message.

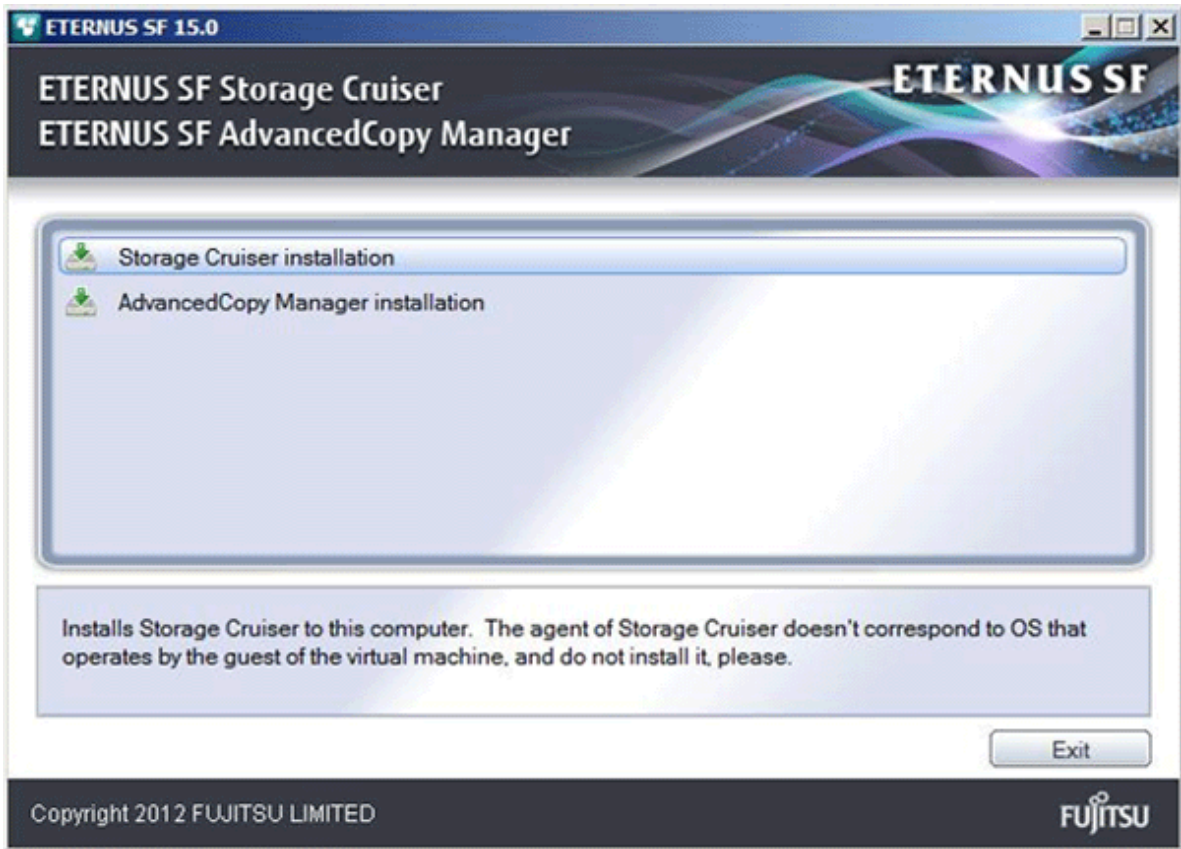
If this output states a Storage Cruiser's agent package, check the version level.

5.1.2 Installation procedure of Storage Cruiser's agent (for Windows)

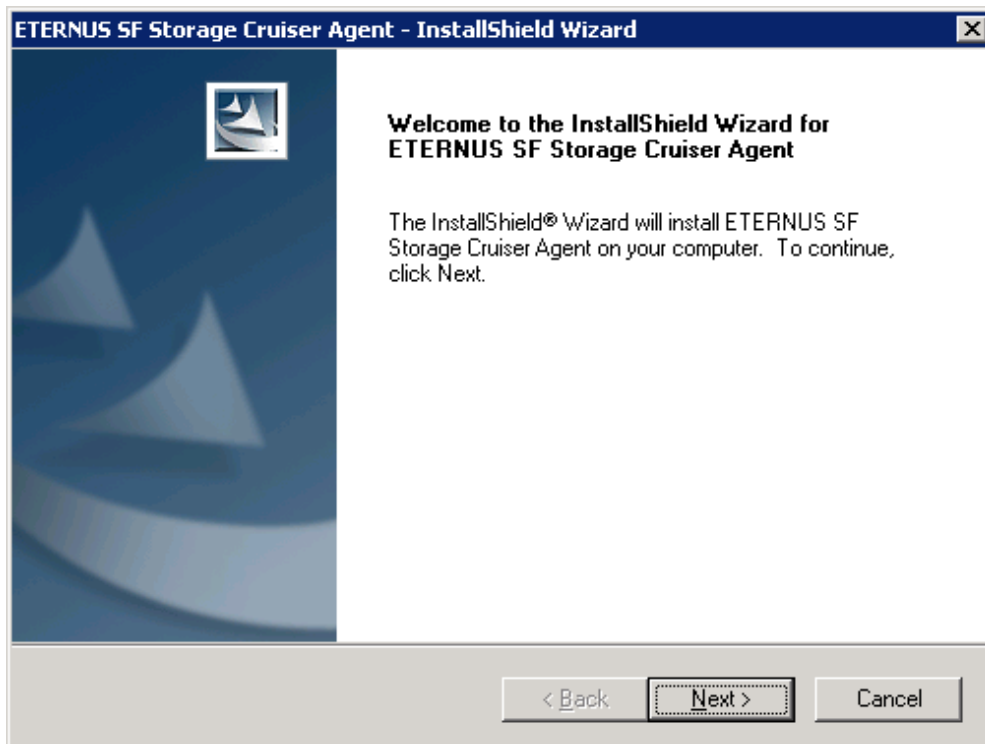
The installation procedure of Storage Cruiser's agent (for Windows) is performed as follows:

1. Using an account with Administrator privileges, log on the server where the installation will be performed.
2. Insert the DVD-ROM "ETERNUS SF SC/ACM/Express V15.0 Mediapack (Agent Program and Manual)" into the DVD-ROM drive.

3. The following screen is displayed. Click the [Storage Cruiser installation] button.



4. The following screen is displayed. After checking the screen contents, click the [Next] button.



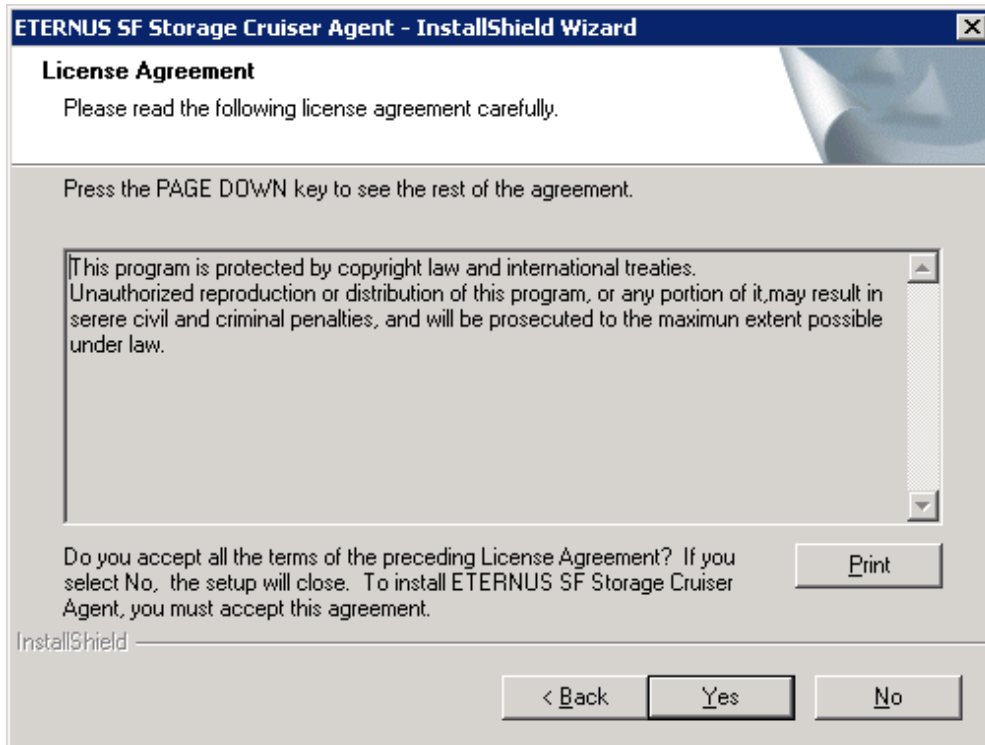
Information

When the Install Shield window is minimized, maximize it by using the task manager. The procedure is as follows:

1. Push the [Ctrl] + [Alt] + [Del] key and start the task manager.
2. Select task manager's [Applications] tag.
3. Select this installer application from the list of the task, and click [Switch To] button.

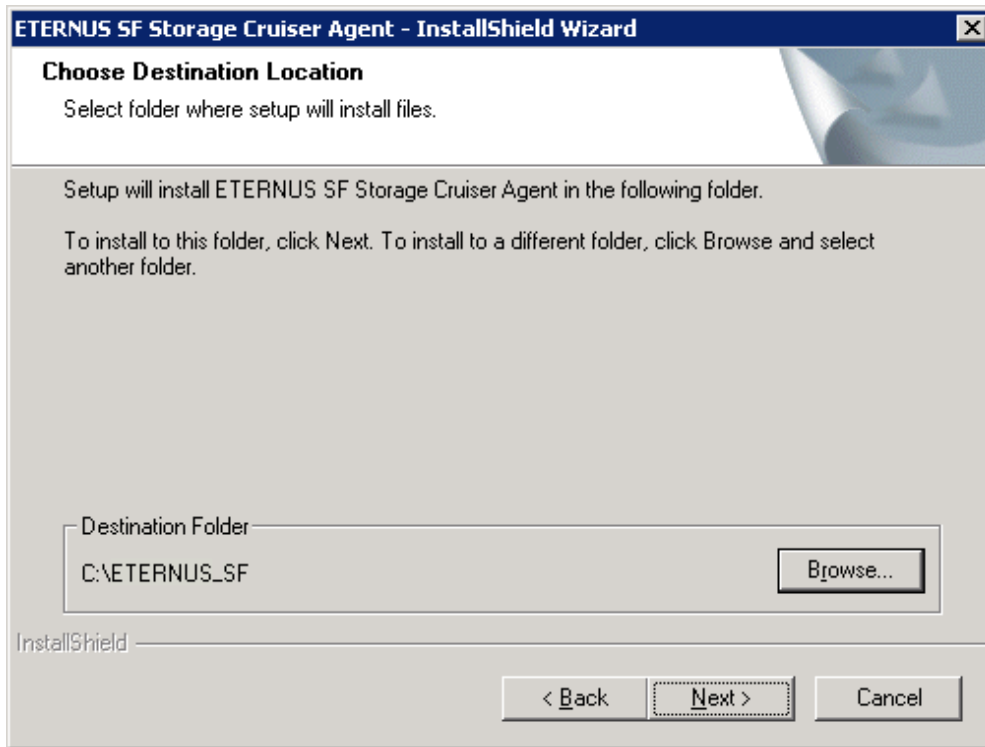
5. Read the terms and conditions in the [License Agreement] screen.

After reading the contents, if the conditions are agreed click the [Yes] button.



6. Specify the installation directory in the [Choose Destination Location] screen.

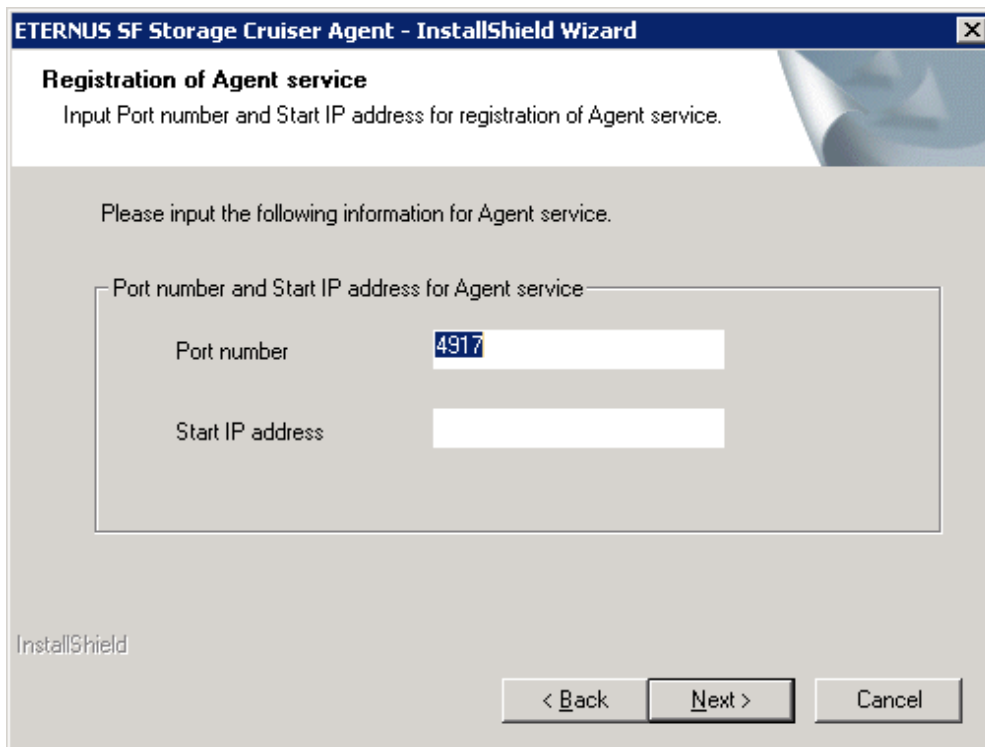
If installing to a directory other than the directory displayed by default, click the [Browse] button and change the install location. After designating all of the directories, click the [Next] button.



Note

The following characters [" | : * ? / . < > , % & ^ = ! ;] cannot be used in directory names.

7. Enter Port number and Start IP address used by agent services in the [Registration of Agent service] screen.

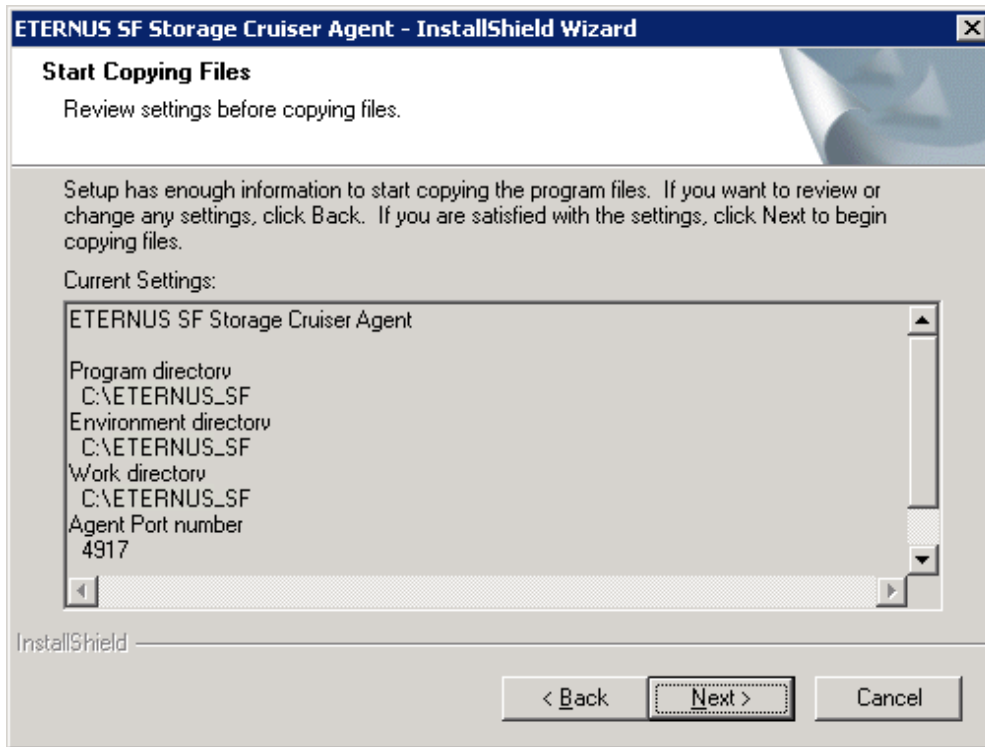


The explanation of each tab is as follows:

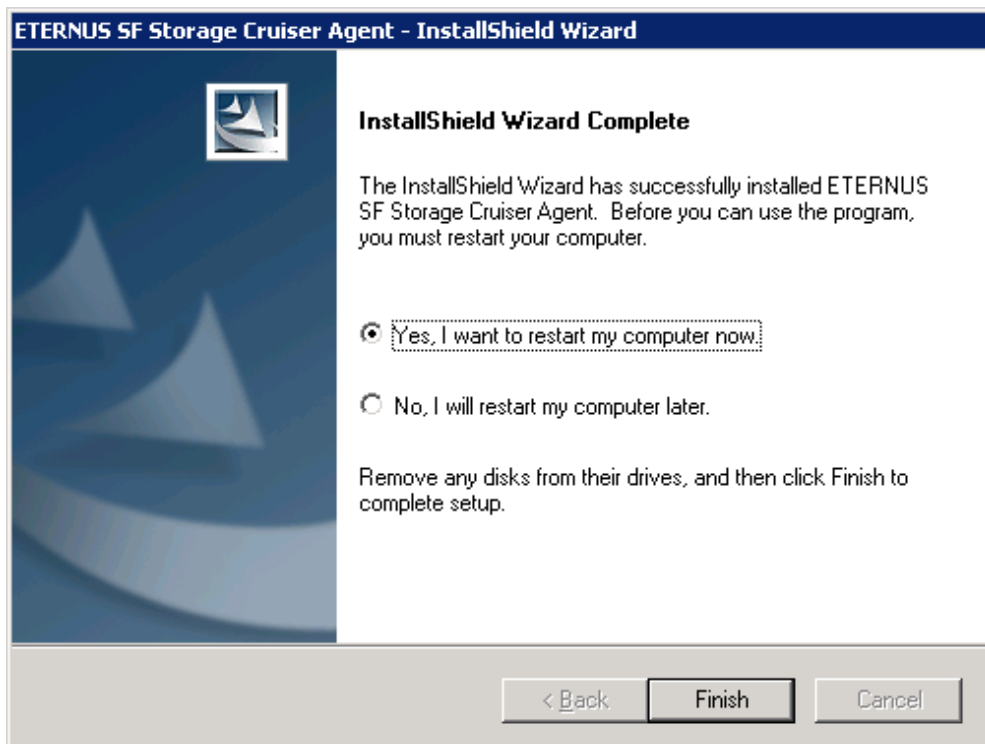
Tab name	Explanation
Port number	<p>This port number is used for transmission between the Storage Cruiser's agent and the manager. Enter the same number as specified in the Management Server configuration.</p> <p>The default value is 4917, and there is usually no need to change this value. However, if the system is already using this port number, allocate an unused port number. In this case, it is necessary to change the port number of sscruisera service in the Management Server to same number.</p> <p>The used port number can be checked with C:\Windows\system32\drivers\etc\services file.</p>
Start IP address	<p>In order to have Storage Cruiser's agent communicate with Storage Cruiser's manager on the correct LAN path, set the Start IP address as the IP address to be used for data communication by the Managed Server (an IP address in the administrative LAN).</p> <p>Depending on the IP addresses that are set on the Managed Server, make this setting as follows:</p> <ul style="list-style-type: none"> - If the Managed Server has only one IP address, enter its IP address. - If multiple IP addresses are set up on the Managed Server, select and specify a Start IP address from the network configuration of the Managed Server and the Management Server. Basically, you should specify an IP address that is set up in the LAN on the route side of the Management Server. - If the Managed Server is under firewall or IP of the Managed Server is converted by NAT, enter the IP address to be able to communicate from the Management Server.

8. Check the settings information in the [Start Copying Files] screen.

If the settings are correct, click the [Next] button. The copy processing starts.
To go back and change a setting, click the [Back] button.



9. Once the copy processing ends, the following screen is displayed. Eject the DVD-ROM from the DVD-ROM drive, and then click the [Finish] button.



10. Restart the system.

The installation of Storage Cruiser's agent (for Windows) is completed.

Set up Storage Cruiser's agent with reference to "6.1 Setup of Storage Cruiser's agent".

5.1.3 Installation procedure of Storage Cruiser's agent (for Solaris)

The installation procedure of Storage Cruiser's agent (for Solaris) is performed as follows:



For installation in the single-user mode:

Check that the local file system is already mounted before the installation. If it is not mounted yet, mount the local file system.

```
# /usr/sbin/mountall -l
```

1. Log in as "root (super user)" on the server on which to install Storage Cruiser's agent.
2. Insert the DVD-ROM "ETERNUS SF SC/ACM/Express V15.0 Mediapack (Agent Program and Manual)" into the DVD-ROM drive and mount the DVD-ROM.

In below example of command execution, the device name of the DVD-ROM drive is mounted as /dev/dsk/c0t4d0s0. The device name for the DVD-ROM drive, however, may be different for your particular device.

```
# mount -F hsfs -o ro /dev/dsk/c0t4d0s0 <DVD-ROM mount point>
```

3. Execute the following command:

```
# cd <DVD-ROM mount point>/Agent_unix/Storage_Cruiser/agent/Solaris  
# ./scagtinstall.sh
```

4. The following message is output. To execute the installation, enter 'y'. To discontinue the installation, enter any key except 'y'.

```
ETERNUS SF Storage Cruiser 15.0  
Copyright FUJITSU LIMITED 2006-2012  
This program will install "ETERNUS SF Storage Cruiser" Agent on your system.  
  
Do you want to continue the installation of this package? [y,n,?,q]
```

5. If enter 'y' in step 4, specify the program install directory for the following question.

```
Please enter install directory. (default: /opt) [?,q]  
  
Please enter variable configuration directory. (default: /var/opt) [?,q]  
  
Please enter fixed configuration directory. (default: /etc/opt) [?,q]
```

The directory names in above message have the following meanings:

Directory name	Meaning
install directory	This is the directory to which the package will be installed. The default directory is /opt.
variable configuration directory	This is the directory to which the variable files (log files, temporary files, etc.) will be installed. The default directory is /var/opt.
fixed configuration directory	This is the directory to which the files for the environment settings will be installed. The default directory is /etc/opt.

6. After all the directories are specified, the following message is output. To continue the installation, enter 'y'. To discontinue the installation, enter 'n'.

```
Using </opt> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.

This package contains scripts which will be executed with super-user
permission during the process of installing this package.

Do you want to continue with the installation of <FJSVssage> [y,n,?]
```

7. If enter 'y' in step 6, the installation will continue.

When installation is completed normally, the following message will be displayed.

```
Installing Storage System Agent for ETERNUS SF as <FJSVssage>
...
Installation of <FJSVssage> was successful.
INFO : "ETERNUS SF Storage Cruiser" Agent was installed successfully.
```

If there is any error during installation, the following message will be displayed.

```
ERROR : not privileged
or
ERROR : "ETERNUS SF Storage Cruiser" Agent cannot be installed in non-global zone.
or
ERROR : Installing FJSVssage was failed.
```

8. Check the installation status by executing the following command:

```
# pkgchk -n FJSVssage
```

If the installation was successful, no information will be displayed.

If any error message is displayed, refer to "[10.1.3 Uninstallation procedure of Storage Cruiser's agent \(for Solaris\)](#)", delete this software and reinstall it.

The installation of Storage Cruiser's agent (for Solaris) is completed.

Set up Storage Cruiser's agent with reference to "[6.1 Setup of Storage Cruiser's agent](#)".

5.1.4 Installation procedure of Storage Cruiser's agent (for Linux)

The installation procedure of Storage Cruiser's agent (for Linux) is performed as follows:

1. Log in as "root (super user)" on the server on which to install Storage Cruiser's agent.
2. Insert the DVD-ROM "ETERNUS SF SC/ACM/Express V15.0 Mediapack (Agent Program and Manual)" into the DVD-ROM drive and mount the DVD-ROM.

In below example of command execution, the device name of the DVD-ROM drive is mounted as /dev/cdrom. The device name for the DVD-ROM drive, however, may be different for your particular device.

```
# mount /dev/cdrom <DVD-ROM mount point>
```

3. Execute the following command:

```
# cd <DVD-ROM mount point>/Agent_unix/Storage_Cruiser/agent/Linux
# /bin/sh ./scagtinstall.sh
```

4. The following message is output. To execute the installation, enter 'y'. To discontinue the installation, enter any key except 'y'.

```
ETERNUS SF Storage Cruiser 15.0
Copyright FUJITSU LIMITED 2006-2012
This program will install "ETERNUS SF Storage Cruiser" Agent on your system.

Do you want to continue the installation of this package? [y,n,?,q]
```

5. If enter 'y' in step 4, the installation will continue.

When installation is completed normally, the following message will be displayed.

```
INFO : Starting Installation of ETERNUS SF Storage Cruiser ...

INFO : Installation of <FJSVssage> was successful.
INFO : ETERNUS SF Storage Cruiser Agent was installed successfully.
```

If there is any error during installation, the following message will be displayed.

```
ERROR : not privileged
or
INFO : Installation is terminated.
or
ERROR : Installing FJSVssage was failed.
```

6. Check the installation status by executing the following command:

```
# rpm -qi FJSVssage
```

If the installation was successful, the package information will be displayed.

If any error message is displayed, refer to "[10.1.4 Uninstallation procedure of Storage Cruiser's agent \(for Linux\)](#)", delete this software and reinstall it.

The installation of Storage Cruiser's agent (for Linux) is completed.

Set up Storage Cruiser's agent with reference to "[6.1 Setup of Storage Cruiser's agent](#)".

5.1.5 Installation procedure of Storage Cruiser's agent (for HP-UX)

The installation procedure of Storage Cruiser's agent (for HP-UX) is performed as follows:

1. Log in as "root (super user)" on the server on which to install Storage Cruiser's agent.
2. Execute the following command to launch the daemon required for this task:

```
# /usr/sbin/pfs_mountd &
# /usr/sbin/pfsd &
```

3. Insert the DVD-ROM "ETERNUS SF SC/ACM/Express V15.0 Mediapack (Agent Program and Manual)" into the DVD-ROM drive and mount the DVD-ROM.

In below example of command execution, the device name of the DVD-ROM drive is mounted as /dev/dsk/clt2d0. The device name for the DVD-ROM drive, however, may be different for your particular device.

- For earlier than v11.23:

```
# /usr/sbin/pfs_mount -t rrip -x unix /dev/dsk/clt2d0 <DVD-ROM mount point>
```

- For v11.23 or later:

```
# mount -F cdfs /dev/dsk/clt2d0 <DVD-ROM mount point>
```



Note

There are the following cautions about mounting the DVD-ROM:

- If the user (usually "root") who executes the `pfs_mount` command belongs to 9 or more groups, the following error message will be output:

```
pfs_mount /dev/dsk/<device name> not owner.  
pfs_mount giving up on cdrom.
```

If the user who executes the `pfs_mount` command belongs to 9 or more groups, in the `/etc/group` file, modify the number of groups to which the user belongs to 8 or less.

- On executing the `pfs_mount` command, the following error message may be output:

```
/usr/sbin/pfs_mount:/etc/pfs_fstab:No such file or directory
```

In this case, create the `/etc/pfs_fstab` file in the `/etc` directory.

```
# touch /etc/pfs_fstab  
# chown root:root /etc/pfs_fstab  
# chmod 644 /etc/pfs_fstab
```

- If `/etc/resolv.conf` file exists, executing the `pfs_mount` command may result in an error. Use the following method to temporarily move the `/etc/resolv.conf` file out of the way and then execute the `pfs_mount` command.

1. After temporarily moving the file out of the way, execute the `pfs_mount` command.

```
# mv resolv.conf resolv.conf.org
```

2. After installing Storage Cruiser's agent, restore the environment.

```
# mv resolv.conf.org resolv.conf
```

4. Install the package.

Copy the compressed target operating system package from the DVD-ROM to the `<Workdir>` directory, and uncompress it. Execute the `swinstall` command. Examples for executing the command are as follows:

- For HP-UX 11.0 or HP-UX 11i v1:

```
# cp <DVD-ROM mount point>/Agent_unix/Storage_Cruiser/HP-UX/pkg/FJSVssage-13.0.0.depot.Z  
<Workdir>  
# uncompress <Workdir>/FJSVssage-13.0.0.depot.Z  
# swinstall -s <Workdir>/FJSVssage-13.0.0.depot
```

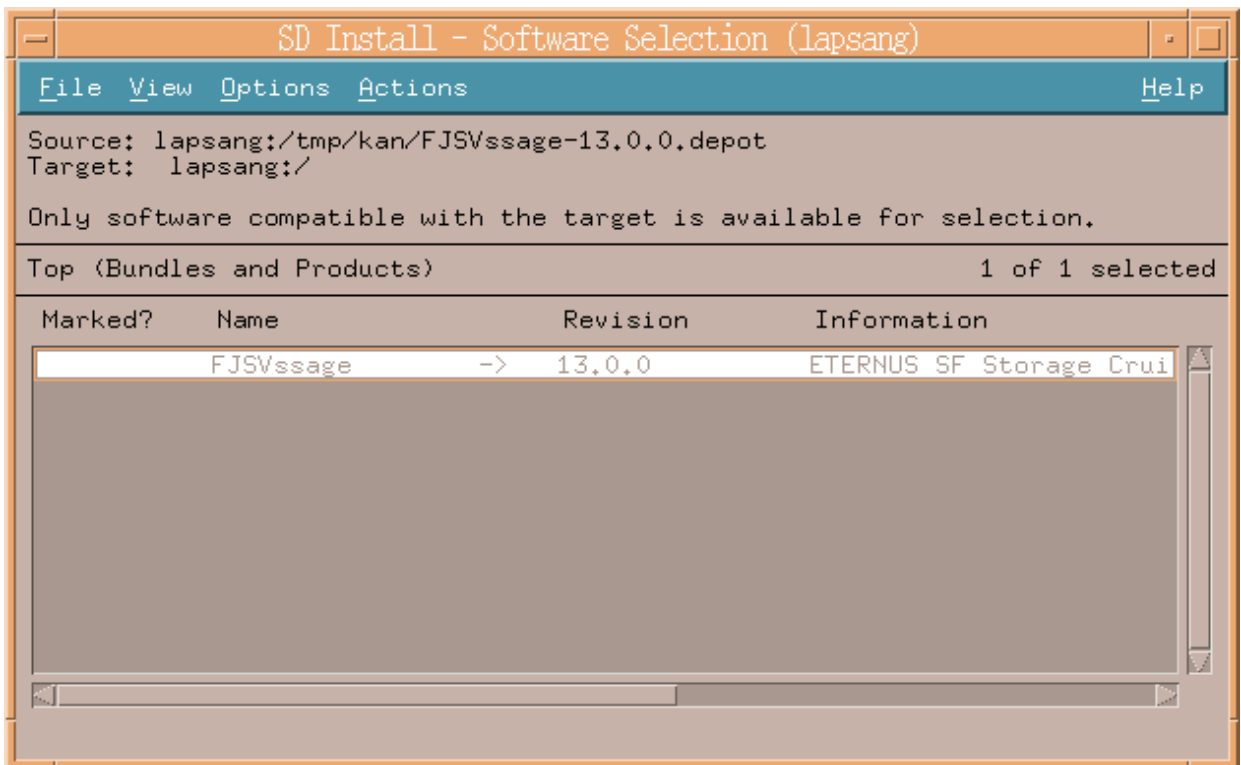
- For HP-UX 11i v2(Itanium) or HP-UX 11i v3(Itanium)

```
# cp <DVD-ROM mount point>/Agent_unix/Storage_Cruiser/HP-UX/pkg/  
FJSVssage-13.4.0_ia64.depot.Z <Workdir>  
# uncompress <Workdir>/FJSVssage-13.4.0_ia64.depot.Z  
# swinstall -s <Workdir>/FJSVssage-13.4.0_ia64.depot
```

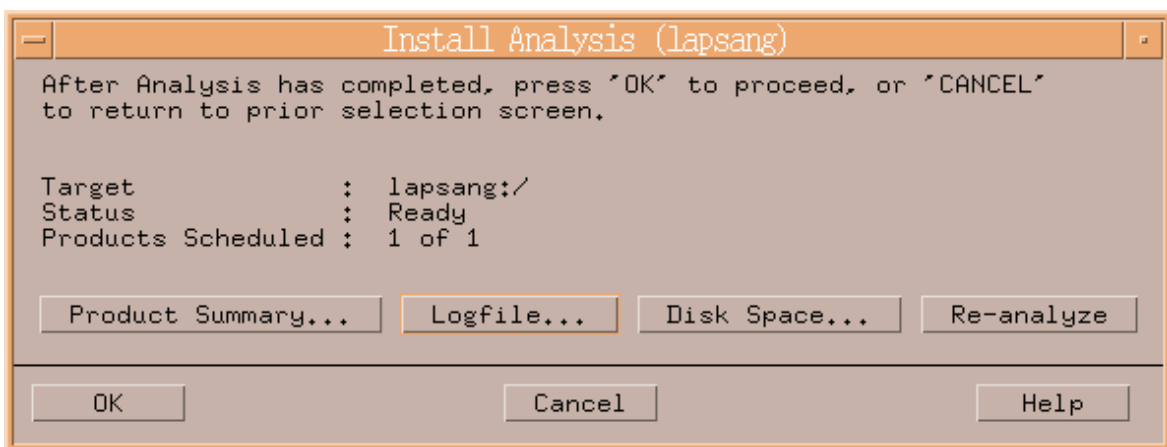
- For HP-UX 11i v2(PA-RISC) or HP-UX 11i v3(PA-RISC)

```
# cp <DVD-ROM mount point>/Agent_unix/Storage_Cruiser/HP-UX/pkg/  
FJSVssage-13.4.0_pa.depot.Z <Workdir>  
# uncompress <Workdir>/FJSVssage-13.4.0_pa.depot.Z  
# swinstall -s <Workdir>/FJSVssage-13.4.0_pa.depot
```

5. The following screen will be displayed. Select "FJSVssage" from the list, and click [Actions]-[install].

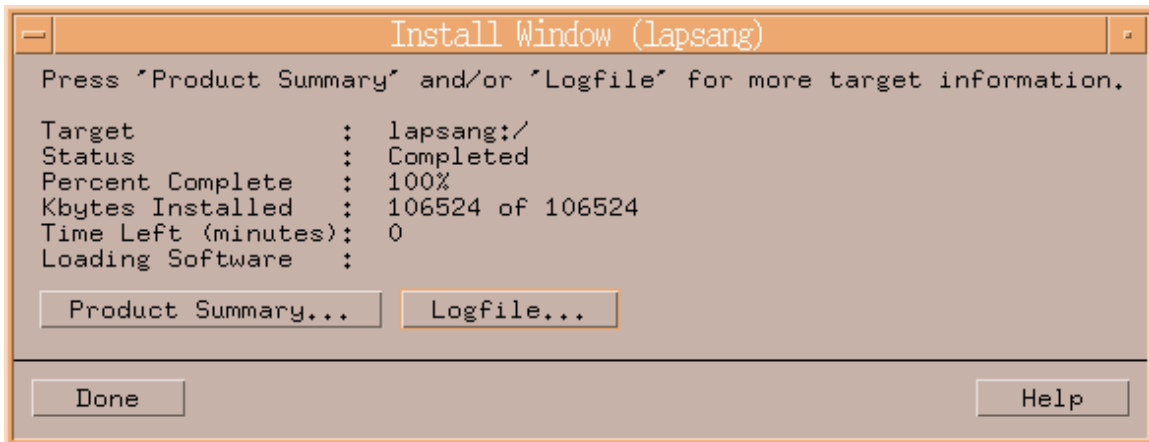


6. The [Install Analysis] screen will be displayed, and package will be checked. After checking package, click [OK] button.



7. The [Install Window] screen will be displayed.

When "Completed" is displayed in the [Status] field, the installation is completed. For detailed information, click [Logfile] button. Click the [Done] button to go back to the initial screen.



8. The installation is completed. Delete the package copied in step 5, as it is no longer needed.

The installation of Storage Cruiser's agent (for HP-UX) is completed.

Set up Storage Cruiser's agent with reference to "[6.1 Setup of Storage Cruiser's agent](#)".

5.1.6 Installation procedure of Storage Cruiser's agent (for VMware)

The installation procedure of Storage Cruiser's agent (for VMware) is performed as follows:

1. Log in as "root (super user)" on the server (Service Console of VMware ESX Server) on which to install the Storage Cruiser's agent.
2. Insert the DVD-ROM "ETERNUS SF SC/ACM/Express V15.0 Mediapack (Agent Program and Manual)" into the DVD-ROM drive and mount the DVD-ROM.

In below example of command execution, the device name of the DVD-ROM drive is mounted as /dev/cdrom. The device name for the DVD-ROM drive, however, may be different for your particular device.

```
# mount /dev/cdrom <DVD-ROM mount point>
```

3. Execute the following command:

```
# cd <DVD-ROM mount point>/Agent_unix/Storage_Cruiser/agent/Linux
# ./scagtinstall.sh
```

4. The following message is output. To execute the installation, enter 'y'. To discontinue the installation, enter any key except 'y'.

```
ETERNUS SF Storage Cruiser 15.0
Copyright FUJITSU LIMITED 2006-2012
This program will install "ETERNUS SF Storage Cruiser" Agent on your system.

Do you want to continue the installation of this package? [y,n,?,q]
```

5. If enter 'y' in step 4, the installation will continue.

When installation is completed normally, the following message will be displayed.

```
INFO : Starting Installation of ETERNUS SF Storage Cruiser ...

INFO : Installation of <FJSVssage> was successful.
INFO : ETERNUS SF Storage Cruiser Agent was installed successfully.
```

If there is any error during installation, the following message will be displayed.

```
ERROR : not privileged
or
INFO  : Installation is terminated.
or
ERROR : Installing FJSVssage was failed.
```

6. Check the installation status by executing the following command:

```
# rpm -qi FJSVssage
```

If the installation was successful, the package information will be displayed.

If any error message is displayed, refer to "[10.1.6 Uninstallation procedure of Storage Cruiser's agent \(for VMware\)](#)", delete this software and reinstall it.

The installation of Storage Cruiser's agent (for VMware) is completed.

Set up Storage Cruiser's agent with reference to "[6.1 Setup of Storage Cruiser's agent](#)".

5.2 Installation of AdvancedCopy Manager's agent

This section explains how to install AdvancedCopy Manager's agent.

5.2.1 Before installation

The following preparation work must be done before starting the installation of AdvancedCopy Manager's agent.

5.2.1.1 Available disk space verification

Make sure that there is enough available disk space on the server where the installation will be performed.

For information on the disk space required for installation, refer to "[2.4.3.1 Required disk space for installation](#)".

If there is not enough available disk space, perform either of the following actions in order to secure the disk space required for installation:

- Increase disks
- Reconfigure the disk partitions

5.2.1.2 Previous version level and incompatible software uninstallation

Check if SystemWalker/StorageMGR, AdvancedCopy Manager at older version level or any incompatible software is installed on the server where the installation will be performed.

If found, refer to the following manual and uninstall it before starting the installation.

About the incompatible software for AdvancedCopy Manager's agent, refer to "[2.4.2.3 Incompatible software](#)".

software to be uninstalled	Reference manual
SystemWalker/StorageMGR	Installation manual of SystemWalker/StorageMGR for relevant version level and types of M/A and SE/EE
Incompatible software other than listed above	Manual for incompatible software

Check the installation progress for SystemWalker/StorageMGR or previous version level AdvancedCopy Manager using the following method:

For Windows environment

From the Control Panel, open the following screen to check whether components of SystemWalker/StorageMGR or older version level AdvancedCopy Manager are displayed.

OS type	Name of screen to be opened
Windows Server 2003	Add or Remove Programs
Windows Server 2008	Programs and Features

If any component is displayed, perform the actions described below.

- If the component of SystemWalker/StorageMGR is displayed:
SystemWalker/StorageMGR is installed. Referring to the displayed result, confirm the version level and types of M/A and SE/EE.
- If the component of AdvancedCopy Manager is displayed:
An older version level of AdvancedCopy Manager is installed. Confirm the version level.

For Solaris environment

Execute the following command:

```
# pkginfo -l FJSVswsts
```

If the package information is displayed, SystemWalker/StorageMGR or an older version level of AdvancedCopy Manager is installed.

- If the package information displays "SystemWalker/StorageMGR":
SystemWalker/StorageMGR is installed. Referring to the displayed result, confirm the version level and types of M/A and SE/EE.
- If the package information displays "AdvancedCopy Manager":
An older version level of AdvancedCopy Manager is installed. Confirm the version level.
The type of installed component (manager or agent) can be checked by executing the following command:

```
# pkginfo -l FJSVswssc
```

If the package information is output, the component of AdvancedCopy Manager's manager is installed. If no information is output, the component of AdvancedCopy Manager's agent is installed

For Linux environment

Execute the following command:

```
# rpm -qi FJSVswsts
```

If "AdvancedCopy Manager" is displayed in the command result, an older version level of AdvancedCopy Manager is installed. Confirm the version level.

The type of installed component (manager or agent) can be checked by the following command:

```
# rpm -qi FJSVswssc
```

If the package information is output, the component of AdvancedCopy Manager's manager is installed. If no information is output, the component of AdvancedCopy Manager's agent is installed

For HP-UX environment

Check whether any of the following files are on the server:

- /opt/swstorage/etc/swstg.ini
- /etc/opt/swstorage/swstg.ini

If any of the above files are on the server, SystemWalker/StorageMGR or an older version level of AdvancedCopy Manager is installed.

- If "SystemWalker/StorageMGR" is described in /opt/swstorage/setup/stg/swsetup.ini file, SystemWalker/StorageMGR is installed. Referring to the file, confirm the version level and types of SE/EE.
- If "AdvancedCopy Manager" is described in /opt/swstorage/setup/stg/swsetup.ini file, an older version level of AdvancedCopy Manager is installed. Confirm the version level.

For AIX environment

Check whether any of the following files are on the server:

- /opt/swstorage/etc/swstg.ini
- /etc/opt/swstorage/swstg.ini

If any of the above files are on the server, an older version level of AdvancedCopy Manager is installed.

If "AdvancedCopy Manager" is described in /opt/swstorage/setup/stg/swsetup.ini file, an older version level of AdvancedCopy Manager is installed. Confirm the version level.

5.2.2 Installation procedure of AdvancedCopy Manager's agent (for Windows)

There are two methods of performing the installation of AdvancedCopy Manager's agent (for Windows).

- Default installation

Default installation uses the following configuration information. You can skip those entries.

- Installation destination

The "<System Drive>:\Win32app\AdvancedCopyManager" directory is used as the base location for the Program Directory, Environment Directory and Work Directory.

- Port number for the communication service

"1226" is used.

- Custom installation

You need to enter the configuration information for Installation on the screen (installation destination, communication service port number).



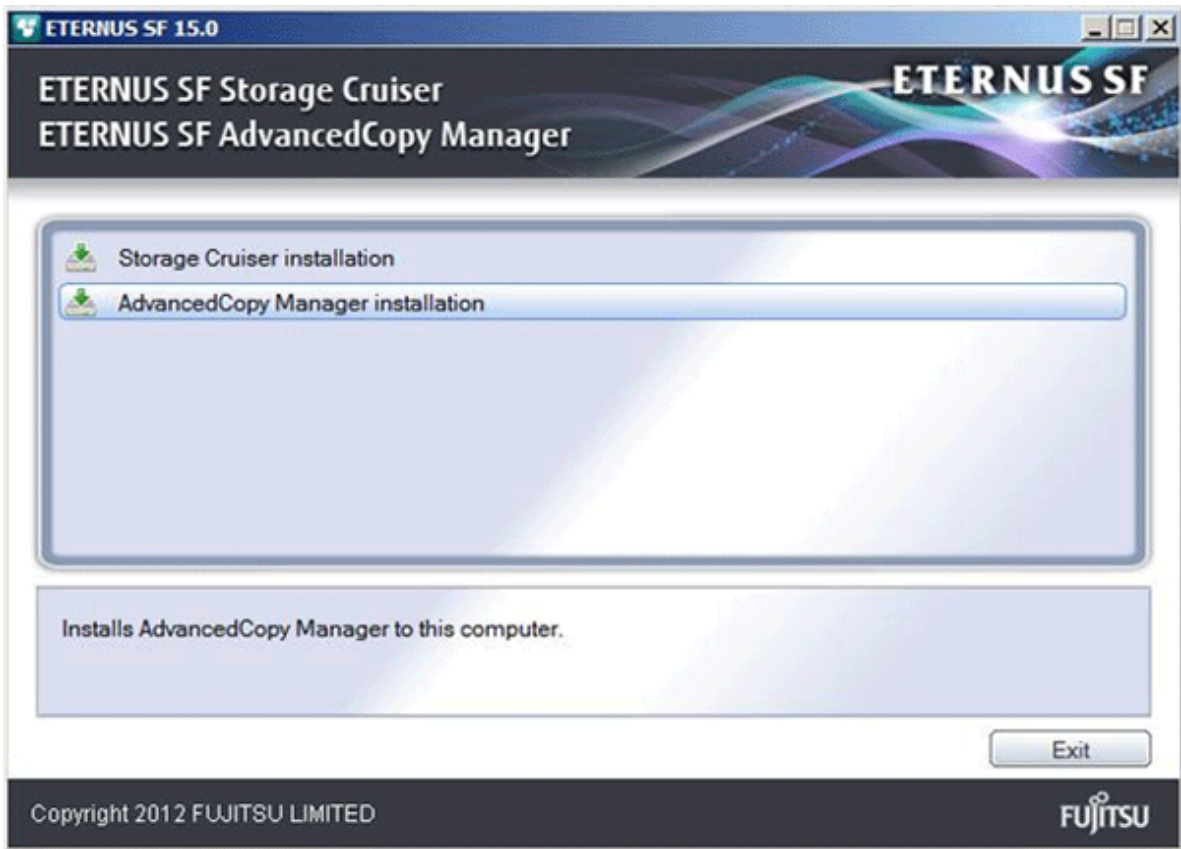
Note

- Use DVD-ROM to install ETERNUS SF Manager.
Do not copy DVD-ROM contents to a local directory for installing ETERNUS SF Manager.
- For cluster operation of the system on which to install AdvancedCopy Manager's agent, refer to "Installation of the Windows version of AdvancedCopy Manager Agent" in the "ETERNUS SF Cluster Environment Setup Guide".

The installation procedure of AdvancedCopy Manager's agent (for Windows) is performed as follows:

1. Using an account with Administrator privileges, log on the server where the installation will be performed.

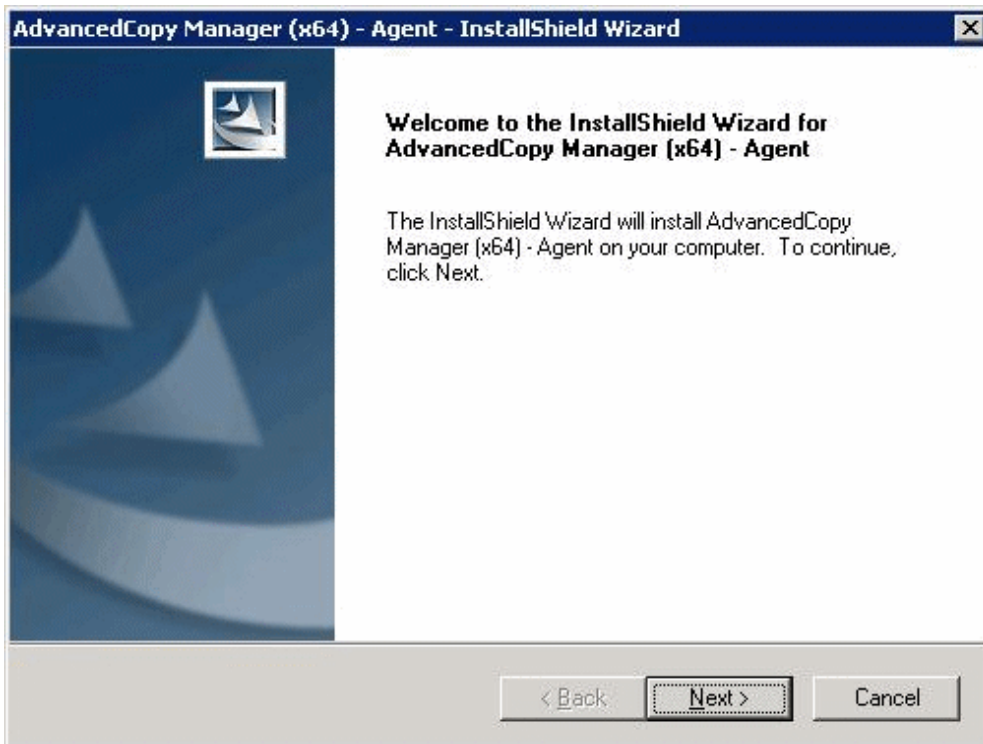
2. Insert the DVD-ROM "ETERNUS SF SC/ACM/Express V15.0 Mediapack (Agent Program and Manual)" into the DVD-ROM drive.
3. The following screen is displayed. Click the [AdvancedCopy Manager installation] button.



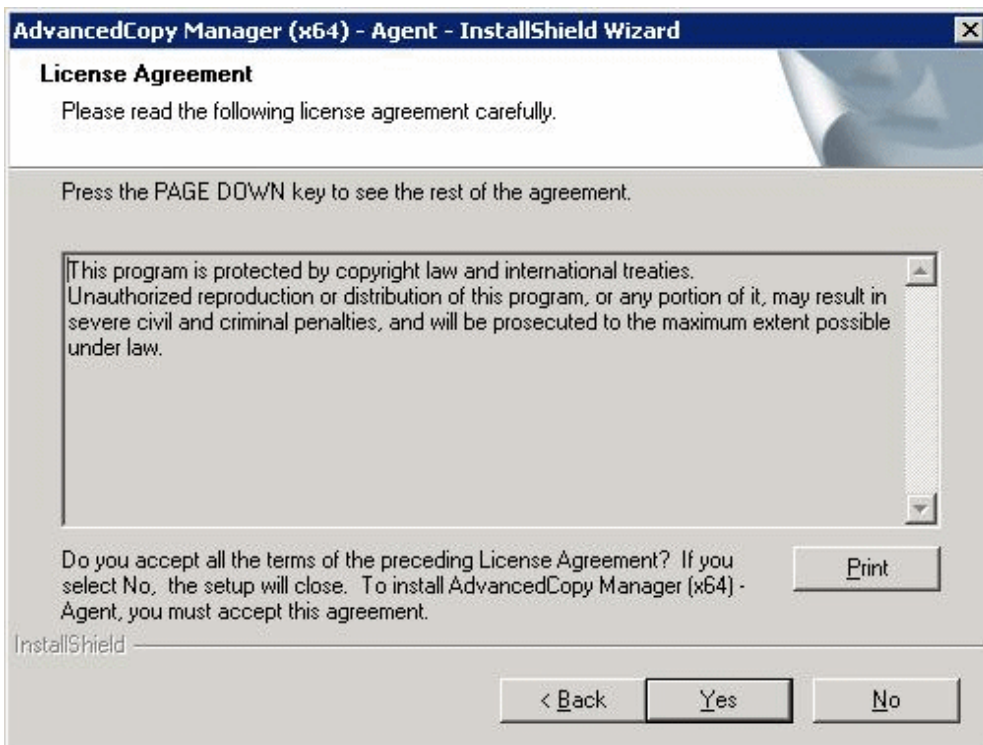
4. The following screen is displayed. Click the [Installation of the Agent].



5. The following screen is displayed in case of the 64bit operating system. After checking the screen contents, click the [Next] button. In case of the 32bit operating system, "x86" is displayed instead of "x64".

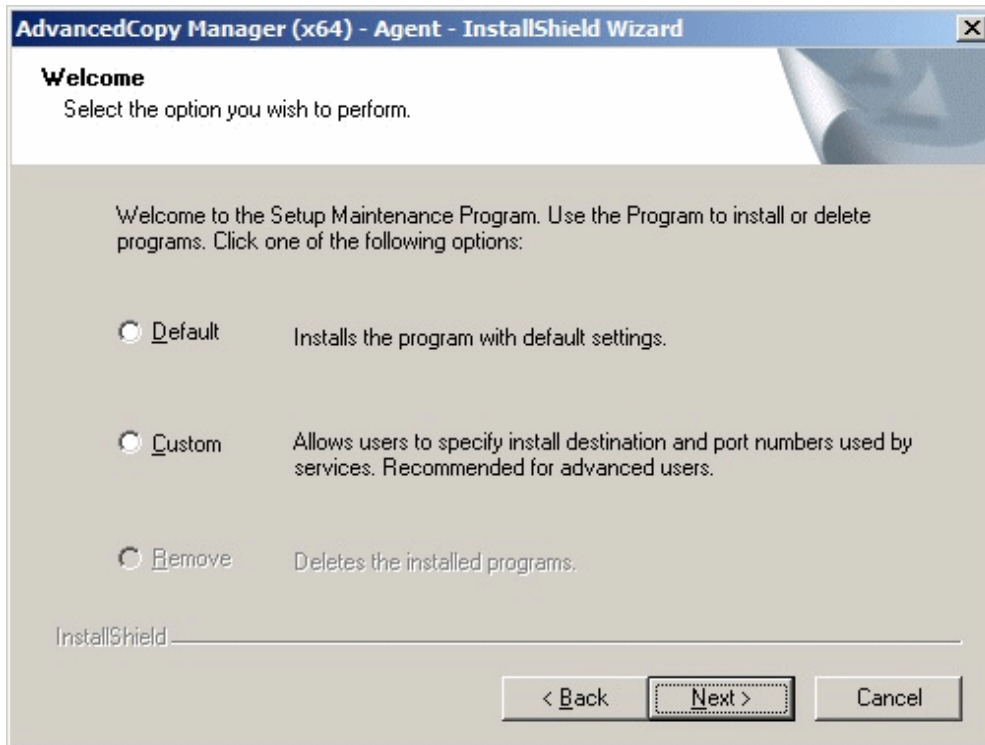


6. Read the terms and conditions in the [License Agreement] screen. After reading the contents, if the conditions are agreed click the [Yes] button.



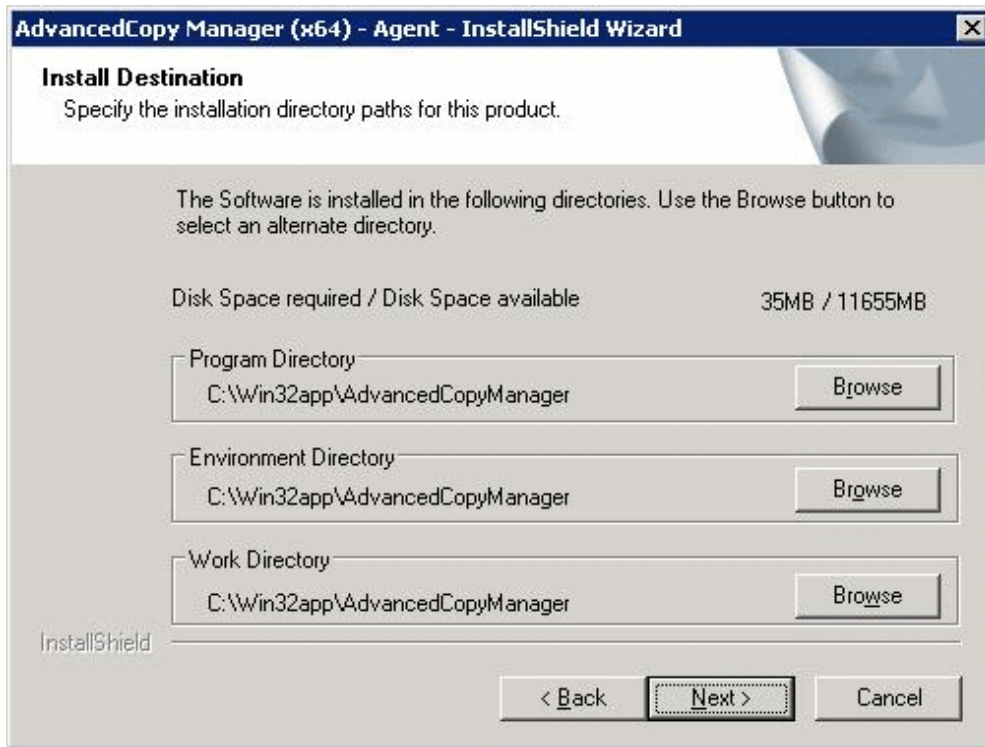
7. On the [Welcome] screen, select the install option. Select an option with reference to the criteria in the table below .

Install option	Explanation
Default	<p>In this installation method, the following checks are automatically performed regarding the information provided as a default:</p> <ul style="list-style-type: none"> - Is there enough disk space for the installation in the default directory? - Is the default port number (1226) available? <p>Consequently, the steps 8 and 9 are skipped.</p> <p>If an error is detected at this stage, a warning dialog is displayed. If no error is detected, the [Start Copying Files] screen is displayed.</p>
Custom	The installation information must be entered in the screens from step 8 and later.



8. Specify the installation directory in the [Install Destination] screen.

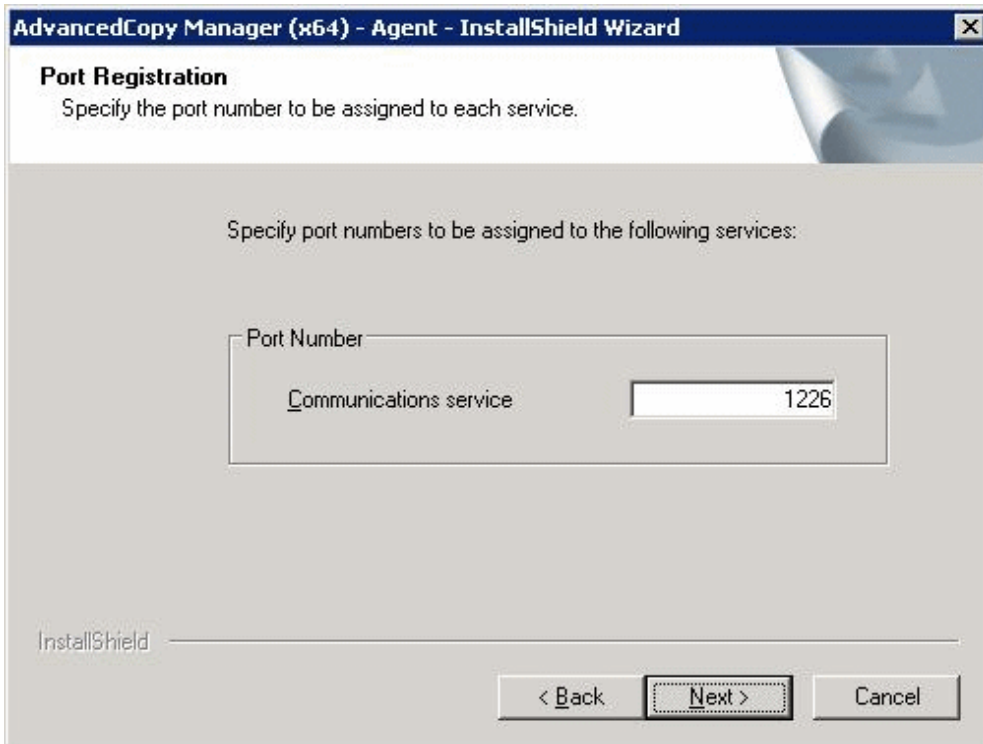
If installing to a directory other than the directory displayed by default, click the [Browse] button and change the install location. After designating all of the directories, click the [Next] button.



 Note

Directories with spaces in their names (e.g. "Program Files") cannot be specified as installation directory.

9. Enter the port number to be allocated for the service in the [Port Registration] screen.



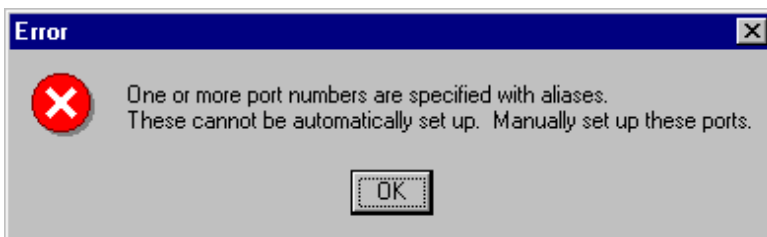
The first displayed value is the recommended value for a non cluster environment.

To change the port number, enter a number within a range from 5001 to 32767.

For cluster operations in Windows Server 2003, it is necessary to change the number to the above range.

After entering the port number, click the [Next] button. If a specified port number is already used, this screen will be displayed again

If the AdvancedCopy Manager service name is defined with alias name, the following dialog will be displayed and the port number specified on the previous screen is ignored. However, processing for installation will continue.

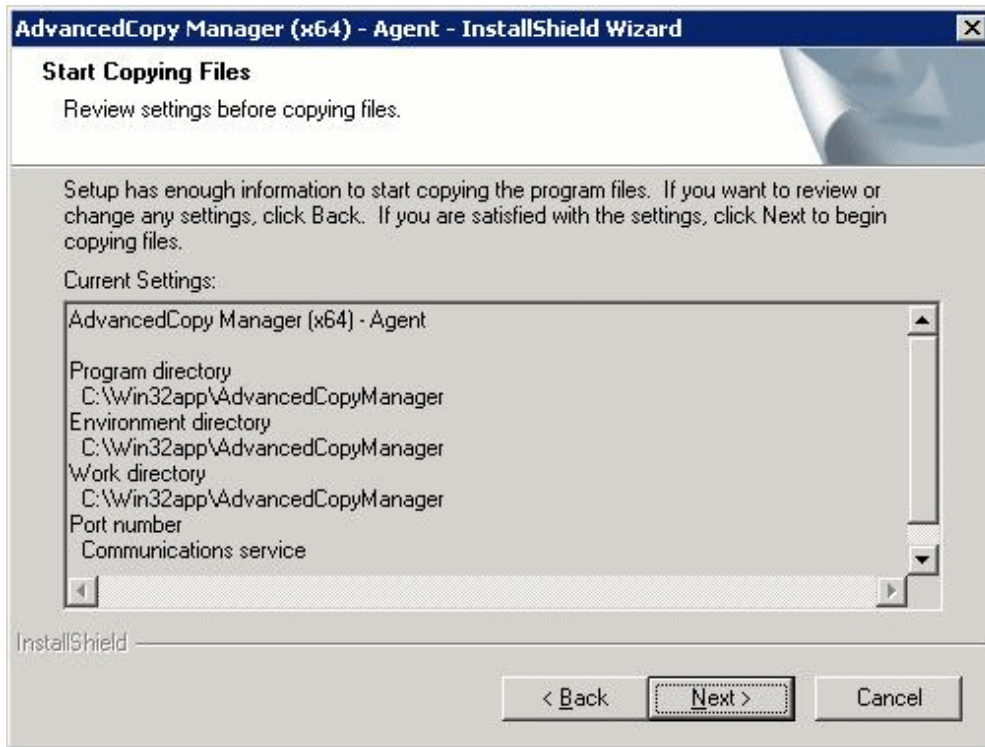


Point

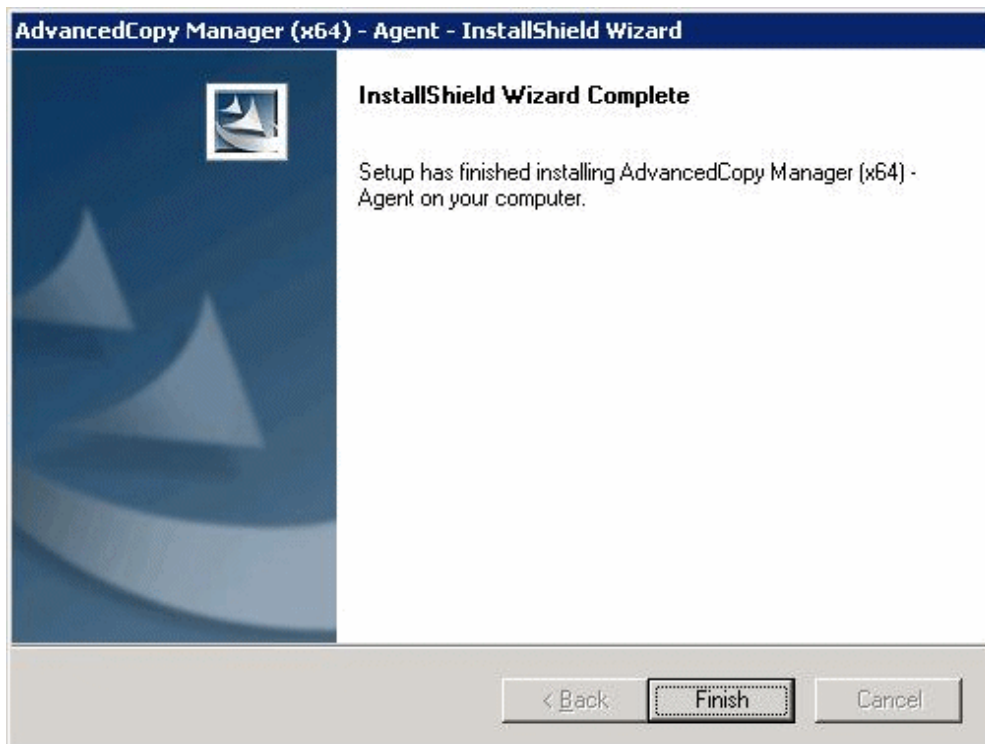
.....
For setting the port number manually, edit the C:\WINDOWS\system32\drivers\etc\services file.
.....

10. Check the settings information in the [Start Copying Files] screen.

If the settings are correct, click the [Next] button. The copy processing starts.
To go back and change a setting, click the [Back] button.



11. Once the copy processing ends, the following screen is displayed. Finish the installation by clicking [Finish] on the window which displayed in step 3 and step 4.



12. Eject the DVD-ROM from the DVD-ROM drive.

The installation of AdvancedCopy Manager's agent (for Windows) is completed.

Set up AdvancedCopy Manager's agent with reference to "6.2 Setup of AdvancedCopy Manager's agent".

5.2.3 Installation procedure of AdvancedCopy Manager's agent (for Solaris)

The installation procedure of AdvancedCopy Manager's agent (for Solaris) is performed as follows:

1. Log in as "root (super user)" on the server on which to install AdvancedCopy Manager's agent.
2. Shut down the system.

```
# shutdown -y -g0 -i0
```

3. Boot the system in single user mode.

```
[ok prompt] boot -s
```

4. Mount the local file system.

```
# /usr/sbin/mountall -l
```

5. Insert the DVD-ROM "ETERNUS SF SC/ACM/Express V15.0 Mediapack (Agent Program and Manual)" into the DVD-ROM drive and mount the DVD-ROM.

In below example of command execution, the device name of the DVD-ROM drive is mounted as /dev/dsk/c0t4d0s0. The device name for the DVD-ROM drive, however, may be different for your particular device.

```
# mount -F hsfs -o ro /dev/dsk/c0t4d0s0 <DVD-ROM mount point>
```

6. Install AdvancedCopy Manager's agent.

By executing the following command, multiple packages are installed at one time.

```
# cd <DVD-ROM mount point>/Agent_unix/AdvancedCopy_Manager/Solaris  
# ./swsetup
```



Information

If, instead of the swsetup command, you execute the easysetup command, specifying the installation directory and registering the port number in the /etc/services file will not be necessary.

- Example of executing the command:

```
# cd <DVD-ROM mount point>/Agent_unix/AdvancedCopy_Manager/Solaris  
# ./easysetup [-o]
```

or

```
# ./easysetup -p port-number [-o]
```

- Operation overview depending on specified options:

Specified option	Overview of operation
None	The port number used on the Managed Server (Storage Server) is 1226 (default). If the port number for the stgxfws service is already registered in the /etc/services file, this registered port number will be used for installation, so that registration of the port number can be omitted.

Specified option	Overview of operation
-p	Use this option to change the port number used on the Managed Server. The port number must be specified within a range from 1024 to 65535. If the port number for the stgxfws service is already registered in the /etc/services file, the registered port number will be used for installation, so that registration of the port number can be omitted.
-o	Use this option if the port number and installation destination directory are to be specified by the interactive setup. If the port number for the stgxfws service is already registered in the /etc/services file, or if this option is specified at the same time as the -p option, the registered port number will be used for installation, so the port number will not be requested.

- Cautions for using the easysetup command:

- A default value is used for the destination directory of installation. For information on this default value, refer to step 8 of this procedure.
- The port number is not registered if the stgxfws service port number or the port number specified by the -p option is already registered by other software. Refer to "6.2.1 Port number setting" to register the port number manually.

7. If an older version level of AdvancedCopy Manager is installed, the following message is displayed and installation processing is aborted.

```
# swsetup: ERROR: AdvancedCopy Manager is already installed.
```

8. When the following message is displayed, enter the installation destination directory.

```
# ./swsetup
swsetup: Installer is preparing for installation...
+-----+
|           ETERNUS SF AdvancedCopy Manager           |
|                               15.0                   |
|           Copyright FUJITSU LIMITED 2012            |
+-----+

Welcome to Setup.
This program will install "AdvancedCopy Manager" on your system.

Agent setup...
Default installation settings for this setup are as follows:
  Program install directory      : /opt
  Fixed configuration directory  : /etc/opt
  Modifying configuration directory : /var/opt

Do you want to change the installation settings? (default: n) [y,n,?,q]
```

The directory names in above message have the following meanings:

Directory name	Meaning
Program install directory	This is the directory to which the package will be installed. The default directory is /opt.
Fixed configuration directory	This is the directory to which the files for the environment settings will be installed. The default directory is /etc/opt.
Modifying configuration directory	This is the directory to which the modified files (log files, temporary files, etc.) will be installed. The default directory is /var/opt.

For modifying any installation destination directory, enter 'y' and proceed to step 9.
For not modifying, enter 'n' or press the [Return] key and proceed to step 10.

9. Specify the installation destination directory.

When the message below is displayed, enter the directory into which to install.

```
Please specify install directory: (default: /opt) [?,q] /acm/opt
Please specify fixed configuration directory: (default: /etc/opt) [?,q] /acm/etc/opt
Please specify variable configuration directory: (default: /var/opt) [?,q] /acm/var/opt
```

When input is complete, a confirmation message like the one below is displayed.
To confirm the message, enter 'n' or press the [Return] key.
To make any other changes, enter 'y' and then modify.

```
Installation settings for this setup are as follows:
  Program install directory      : /acm /opt
  Fixed configuration directory  : /acm /etc/opt
  Modifying configuration directory : /acm /var/opt

Do you want to change the installation settings? (default: n) [y,n,?,q]
```

10. On entering the installation destination directory, a message like the one below is displayed. Enter 'y' to continue, or 'n' to cancel the installation.

```
Do you want to continue with the installation of this package? [y,n,?]
```

11. If 'y' is entered in step 10, the installation will continue.

When the installation completes successfully, the following message is displayed.

```
swsetup: AdvancedCopy Manager was installed successfully.
```

12. Execute the following commands, and then eject the DVD-ROM from the DVD-ROM drive:

```
# cd /
# umount <DVD-ROM mount point>
```

The installation of AdvancedCopy Manager's agent (for Solaris) is completed.

Set up AdvancedCopy Manager's agent with reference to "[6.2 Setup of AdvancedCopy Manager's agent](#)".

5.2.4 Installation procedure of AdvancedCopy Manager's agent (for Linux)

The installation procedure of AdvancedCopy Manager's agent (for Linux) is performed as follows:

1. Log in as "root (super user)" on the server on which to install AdvancedCopy Manager's agent.
2. Insert the DVD-ROM "ETERNUS SF SC/ACM/Express V15.0 Mediapack (Agent Program and Manual)" into the DVD-ROM drive and mount the DVD-ROM.

In below example of command execution, the device name of the DVD-ROM drive is mounted as /dev/cdrom. The device name for the DVD-ROM drive, however, may be different for your particular device.

```
# mount /dev/cdrom <DVD-ROM mount point>
```

3. Install AdvancedCopy Manager's agent.

By executing the following command, multiple packages are installed at one time.

```
# cd <Environment specific directory>
# ./swsetup
```

The <Environment specific directory> is as follows:

OS type	Directory
Red Hat Enterprise Linux AS (v.4 for x86) Red Hat Enterprise Linux AS (v.4 for EM64T) Red Hat Enterprise Linux ES (v.4 for x86) Red Hat Enterprise Linux ES (v.4 for EM64T)	<DVD-ROM mount point>/Agent_unix/ AdvancedCopy_Manager/rhel4_x86
Red Hat Enterprise Linux 5 (for x86)	<DVD-ROM mount point>/Agent_unix/ AdvancedCopy_Manager/rhel5_x86
Red Hat Enterprise Linux 5 (for Intel64)	<DVD-ROM mount point>/Agent_unix/ AdvancedCopy_Manager/rhel5_x64
Red Hat Enterprise Linux 6 (for x86) Red Hat Enterprise Linux 6 (for Intel64)	<DVD-ROM mount point>/Agent_unix/ AdvancedCopy_Manager/rhel6_x86
SUSE Linux Enterprise Server 11 (for x86) SUSE Linux Enterprise Server 11 (for EM64T)	<DVD-ROM mount point>/Agent_unix/ AdvancedCopy_Manager/sles11_x86

Information

If, instead of the swsetup command, you execute the easysetup command, specifying the installation directory and registering the port number in the /etc/services file will not be necessary.

- Example of executing the command:

```
# cd <Environment specific directory>
# ./easysetup [-o]
```

or

```
# ./easysetup -p port-number [-o]
```

- Operation overview depending on specified options:

Specified option	Overview of operation
None	The port number used on the Managed Server (Storage Server) is 1226 (default). If the port number for the stgxfws service is already registered in the /etc/services file, the registered port number will be used for installation, so that registration of the port number can be omitted.
-p	Use this option to change the port number used on the Managed Server. The port number must be specified within a range from 1024 to 65535. If the port number for the stgxfws service is already registered in the /etc/services file, the registered port number will be used for installation, so that registration of the port number can be omitted.
-o	Use this option if the port number and installation destination directory are to be specified by the interactive setup. If the port number for the stgxfws service is already registered in the /etc/services file, or if this option is specified at the same time as the -p option, the registered port number will be used for installation, so the port number will not be requested.

- Cautions for using the easysetup command:

- A default value is used for the destination directory of installation. For information on this default value, refer to step 3 of this procedure.
- The port number is not registered if the stgxfws service port number or the port number specified by the -p option is already registered by other software. Refer to "6.2.1 Port number setting" to register the port number manually.

4. When the following message is displayed, enter the installation destination directory.

```
# ./swsetup
swsetup: Installer is preparing for installation...
+-----+
|           ETERNUS SF AdvancedCopy Manager           |
|                   15.0                               |
|           Copyright FUJITSU LIMITED 2012           |
+-----+

Welcome to Setup.
This program will install "AdvancedCopy Manager" on your system.

Agent setup...
Default installation settings for this setup are as follows:
  Program install directory      : /opt
  Fixed configuration directory  : /etc/opt
  Modifying configuration directory : /var/opt

Do you want to change the installation settings? (default: n) [y,n,?,q]
```

The directory names in above message have the following meanings:

Directory name	Meaning
Program install directory	This is the directory to which the package will be installed. The default directory is /opt.
Fixed configuration directory	This is the directory to which the files for the environment settings will be installed. The default directory is /etc/opt.
Modifying configuration directory	This is the directory to which the modified files (log files, temporary files, etc.) will be installed. The default directory is /var/opt.

For modifying any installation destination directory, enter 'y' and proceed to step 5.

For not modifying, enter 'n' or press the [Return] key, and proceed to step 6.

5. Specify the installation destination directory.

When the message below is displayed, enter the directory into which to install.

```
Please specify install directory: (default: /opt) [?,q] /acm/opt

Please specify fixed configuration directory: (default: /etc/opt) [?,q] /acm/etc/opt

Please specify variable configuration directory: (default: /var/opt) [?,q] /acm/var/opt
```

When input is complete, a confirmation message like the one below is displayed.

To confirm the message, enter 'n' or press the [Return] key.

To make any other changes, enter 'y' and then modify.

```
Installation settings for this setup are as follows:
  Program install directory      : /acm /opt
  Fixed configuration directory  : /acm /etc/opt
  Modifying configuration directory : /acm /var/opt
```

```
Do you want to change the installation settings? (default: n) [y,n,?,q]
```

6. On entering the installation destination directory, a message like the one below is displayed. Enter 'y' to continue, or 'n' to cancel the installation.

```
Do you want to continue with the installation of this package? [y,n,?]
```

7. If 'y' is entered in step 6, the installation will continue.
When the installation completes successfully, the following message is displayed.

```
swsetup: AdvancedCopy Manager was installed successfully.
```

8. Execute the following commands, and then eject the DVD-ROM from the DVD-ROM drive:

```
# cd /  
# umount <DVD-ROM mount point>
```

The installation of AdvancedCopy Manager's agent (for Linux) is completed.

Set up AdvancedCopy Manager's agent with reference to "[6.2 Setup of AdvancedCopy Manager's agent](#)".

5.2.5 Installation procedure of AdvancedCopy Manager's agent (for HP-UX)

The installation procedure of AdvancedCopy Manager's agent (for HP-UX) is performed as follows:

1. Log in as "root (super user)" on the server on which to install AdvancedCopy Manager's agent.
2. Execute the following command to launch the daemon required for this task: This task is not necessary for OS v11.23 or later.

```
# /usr/sbin/pfs_mountd &  
# /usr/sbin/pfsd &
```

3. Insert the DVD-ROM "ETERNUS SF SC/ACM/Express V15.0 Mediapack (Agent Program and Manual)" into the DVD-ROM drive and mount the DVD-ROM.

In below example of command execution, the device name of the DVD-ROM drive is mounted as /dev/dsk/c1t2d0. The device name for the DVD-ROM drive, however, may be different for your particular device.

- For earlier than v11.23:

```
# /usr/sbin/pfs_mount -t rrip -x unix /dev/dsk/c1t2d0 <DVD-ROM mount point>
```

- For v11.23 or later:

```
# mount -F cdfs /dev/dsk/c1t2d0 <DVD-ROM mount point>
```



Note

Cautions about mounting the DVD-ROM:

- If the user (usually "root") who executes the pfs_mount command belongs to 9 or more groups, the following error message will be output:

```
pfs_mount /dev/dsk/<device name> not owner.  
pfs_mount giving up on cdrom.
```

If the user who executes the pfs_mount command belongs to 9 or more groups, in the /etc/group file, modify the number of groups to which the user belongs to 8 or less.

- On executing the `pfs_mount` command, the following error message may be output:

```
/usr/sbin/pfs_mount:/etc/pfs_fstab:No such file or directory
```

In this case, create the `/etc/pfs_fstab` file in the `/etc` directory.

```
# touch /etc/pfs_fstab
# chown root:root /etc/pfs_fstab
# chmod 644 /etc/pfs_fstab
```

- If `/etc/resolv.conf` file exists, executing the `pfs_mount` command may result in an error. Use the following method to temporarily move the `/etc/resolv.conf` file out of the way and then execute the `pfs_mount` command.

1. After temporarily moving the file out of the way, execute the `pfs_mount` command.

```
# mv resolv.conf resolv.conf.org
```

2. After installing AdvancedCopy Manager's agent, restore the environment.

```
# mv resolv.conf.org resolv.conf
```

4. Install AdvancedCopy Manager's agent.

By executing the following command, multiple packages are installed at one time.

```
# cd <DVD-ROM mount point>/Agent_unix/AdvancedCopy_Manager/HP-UX
# ./swsetup
```

Information

If, instead of the `swsetup` command, you execute the `easyssetup` command, specifying the installation directory and registering the port number in the `/etc/services` file will not be necessary.

- Example of executing the command:

```
# cd <DVD-ROM mount point>/Agent_unix/AdvancedCopy_Manager/HP-UX
# ./easyssetup [-o]
```

or

```
# ./easyssetup -p port-number [-o]
```

- Operation overview depending on specified options:

Specified option	Overview of operation
None	The port number used on the Managed Server (Storage Server) is 1226 (default). If the port number for the <code>stgxfws</code> service is already registered in the <code>/etc/services</code> file, the registered port number will be used for installation, so that registration of the port number can be omitted.
-p	Use this option to change the port number used on the Managed Server. The port number must be specified within a range from 1024 to 65535. If the port number for the <code>stgxfws</code> service is already registered in the <code>/etc/services</code> file, the registered port number will be used for installation, so that registration of the port number can be omitted.
-o	Use this option if the port number and installation destination directory are to be specified by the interactive setup.

Specified option	Overview of operation
	If the port number for the stgxfws service is already registered in the /etc/services file, or if this option is specified at the same time as the -p option, the registered port number will be used for installation, so the port number will not be requested.

- Cautions for using the easysetup command:

- A default value is used for the destination directory of installation. For information on this default value, refer to step 6 of this procedure.
- The port number is not registered if the stgxfws service port number or the port number specified by the -p option is already registered by other software. Refer to "6.2.1 Port number setting" to register the port number manually.

5. If an older version level of AdvancedCopy Manager is installed, the following message is displayed and installation processing is aborted.

```
# swsetup: ERROR: AdvancedCopy Manager is already installed.
```

6. When the following message is displayed, enter the installation destination directory.

```
# ./swsetup
swsetup: Installer is preparing for installation...

+-----+
|           ETERNUS SF AdvancedCopy Manager           |
|                   15.0                               |
|           Copyright FUJITSU LIMITED 2012            |
+-----+

Welcome to Setup.
This program will install "AdvancedCopy Manager" on your system.

Agent setup...
Default installation settings for this setup are as follows:
  Program install directory       : /opt
  Fixed configuration directory   : /etc/opt
  Modifying configuration directory : /var/opt

Do you want to change the installation settings? (default: n) [y,n,?,q]
```

The directory names in above message have the following meanings:

Directory name	Meaning
Program install directory	This is the directory to which the package will be installed. The default directory is /opt.
Fixed configuration directory	This is the directory to which the files for the environment settings will be installed. The default directory is /etc/opt.
Modifying configuration directory	This is the directory to which the modified files (log files, temporary files, etc.) will be installed. The default directory is /var/opt.

For modifying any installation destination directory, enter 'y' and proceed to step 7.

For not modifying, enter 'n' or press the [Return] key, and proceed to step 8.

7. Specify the installation destination directory.

When below message is displayed, enter the directory into which to install.

```
Please specify install directory: (default: /opt) [?,q] /acm/opt
```

```
Please specify fixed configuration directory: (default: /etc/opt) [?,q] /acm/etc/opt
Please specify variable configuration directory: (default: /var/opt) [?,q] /acm/var/opt
```

When input is complete, a confirmation message like the one below is displayed.
To confirm the message, enter 'n' or press the [Return] key.
To make any other changes, enter 'y' and then modify.

```
Installation settings for this setup are as follows:
  Program install directory      : /acm /opt
  Fixed configuration directory   : /acm /etc/opt
  Modifying configuration directory : /acm /var/opt

Do you want to change the installation settings? (default: n) [y,n,?,q]
```

8. On entering the installation destination directory, a message like the one below is displayed. Enter 'y' to continue, or 'n' to cancel the installation.

```
Do you want to continue with the installation of this package? [y,n,?]
```

9. If 'y' is entered in step 8, the installation will continue.
When the installation completes successfully, the following message is displayed.

```
swsetup: AdvancedCopy Manager was installed successfully.
```

10. Execute the following commands, and then eject the DVD-ROM from the DVD-ROM drive:

```
# cd /
# umount <DVD-ROM mount point>
```

The installation of AdvancedCopy Manager's agent (for HP-UX) is completed.

Set up AdvancedCopy Manager's agent with reference to "[6.2 Setup of AdvancedCopy Manager's agent](#)".

5.2.6 Installation procedure of AdvancedCopy Manager's agent (for AIX)

The installation procedure of AdvancedCopy Manager's agent (for AIX) is performed as follows:

1. Log in as "root (super user)" on the server on which to install AdvancedCopy Manager's agent.
2. Insert the DVD-ROM "ETERNUS SF SC/ACM/Express V15.0 Mediapack (Agent Program and Manual)" into the DVD-ROM drive and mount the DVD-ROM.

In below example of command execution, the device name of the DVD-ROM drive is mounted as /dev/cd0. The device name for the DVD-ROM drive, however, may be different for your particular device.

```
# /usr/sbin/mount -o ro -v cdrfs /dev/cd0 <DVD-ROM mount point>
```

3. Install AdvancedCopy Manager's agent.

By executing the following command, multiple packages are installed at one time.

```
# cd <DVD-ROM mount point>/Agent_unix/AdvancedCopy_Manager/AIX
# ./swsetup
```

Information

If, instead of the swsetup command, you execute the easyswsetup command, specifying the installation directory and registering the port number in the /etc/services file will not be necessary.

- Example of executing the command:

```
# cd <DVD-ROM mount point>/Agent_unix/AdvancedCopy_Manager/AIX
# ./easysetup [-o]
```

or

```
# ./easysetup -p port-number [-o]
```

- Operation overview depending on specified options:

Specified option	Overview of operation
None	The port number used on the Managed Server (Storage Server) is 1226 (default). If the port number for the stgxfws service is already registered in the /etc/services file, the registered port number will be used for installation, so that registration of the port number can be omitted.
-p	Use this option to change the port number used on the Managed Server. The port number must be specified within a range from 1024 to 65535. If the port number for the stgxfws service is already registered in the /etc/services file, the registered port number will be used for installation, so that registration of the port number can be omitted.
-o	Use this option if the port number and installation destination directory are to be specified by the interactive setup. If the port number for the stgxfws service is already registered in the /etc/services file, or if this option is specified at the same time as the -p option, the registered port number will be used for installation, so the port number will not be requested.

- Cautions for using the easysetup command:

- A default value is used for the destination directory of installation. For information on this default value, refer to step 4 of this procedure.
- The port number is not registered if the stgxfws service port number or the port number specified by the -p option is already registered by other software. Refer to "6.2.1 Port number setting" to register the port number manually.

4. When the following message is displayed, enter the installation destination directory.

```
# ./swsetup
swsetup: Installer is preparing for installation...
+-----+
|          ETERNUS SF AdvancedCopy Manager          |
|                      15.0                      |
|          Copyright FUJITSU LIMITED 2012          |
+-----+

Welcome to Setup.
This program will install "AdvancedCopy Manager" on your system.

Agent setup...
Default installation settings for this setup are as follows:
    Program install directory      : /opt
    Fixed configuration directory  : /etc/opt
    Modifying configuration directory : /var/opt

Do you want to change the installation settings? (default: n) [y,n,?,q]
```

The directory names in above message have the following meanings:

Directory name	Meaning
Program install directory	This is the directory to which the package will be installed. The default directory is /opt.
Fixed configuration directory	This is the directory to which the files for the environment settings will be installed. The default directory is /etc/opt.
Modifying configuration directory	This is the directory to which the modified files (log files, temporary files, etc.) will be installed. The default directory is /var/opt.

For modifying any installation destination directory, enter 'y' and proceed to step 5.
For not modifying, enter 'n' or press the [Return] key, and proceed to step 6.

5. Specify the installation destination directory.

When below message is displayed, enter the directory into which to install.

```
Please specify install directory: (default: /opt) [?,q] /acm/opt
Please specify fixed configuration directory: (default: /etc/opt) [?,q] /acm/etc/opt
Please specify variable configuration directory: (default: /var/opt) [?,q] /acm/var/opt
```

When input is complete, a confirmation message like the one below is displayed.
To confirm the message, enter 'n' or press the [Return] key.
To make any other changes, enter 'y' and then modify.

```
Installation settings for this setup are as follows:
  Program install directory      : /acm /opt
  Fixed configuration directory  : /acm /etc/opt
  Modifying configuration directory : /acm /var/opt

Do you want to change the installation settings? (default: n) [y,n,?,q]
```

6. On entering the installation destination directory, a message like the one below is displayed. Enter 'y' to continue, or 'n' to cancel the installation.

```
Do you want to continue with the installation of this package? [y,n,?]
```

7. If 'y' is entered in step 6, the installation will continue.
When the installation completes successfully, the following message is displayed.

```
swsetup: AdvancedCopy Manager was installed successfully.
```



.....
If the easyssetup command has not been executed in step 3, enter the following line in the /etc/rc.shutdown file.

```
/opt/FJSVswstf/daemon/stop_smgr0
```

If the above line is not in the /etc/rc.shutdown file, AdvancedCopy Manager may not stop correctly. Also, AdvancedCopy Manager may not start normally when the OS is restarted, and this would have an adverse effect on operation. Do not use the reboot command to restart the OS, use the shutdown command.
.....

8. Execute the following commands, and then eject the DVD-ROM from the DVD-ROM drive:

```
# cd /
# /usr/sbin/umount <DVD-ROM mount point>
```

The installation of AdvancedCopy Manager's agent (for AIX) is completed.

Set up AdvancedCopy Manager's agent with reference to "[6.2 Setup of AdvancedCopy Manager's agent](#)".

Chapter 6 Setup of ETERNUS SF Agent

This chapter explains procedures and methods for setting up Storage Cruiser's agent and AdvancedCopy Manager's agent.

6.1 Setup of Storage Cruiser's agent

This section explains how to set up Storage Cruiser's agent.

6.1.1 Port number setting

By default, Storage Cruiser's agent uses LAN port number 4917 to communicate with Storage Cruiser's manager (Management Server). The relationship of service name, port number, protocol name, sender and receiver is as follows:

Service name	Port number / Protocol name	Sender	Receiver
sscruisera	4917/tcp	Storage Cruiser's manager	Storage Cruiser's agent

Point

If the system is already using this port number, allocate an unused port number. In this case, it is necessary to change the port number of **sscruisera** service in the Management Server to same number.

Methods for setting the port number to be used are described below. If no other port number is specified, port number 4917 will be applied when launching Storage Cruiser's agent.

For Windows environment

This information reflects the port number that was entered during installation of Storage Cruiser's agent, in "Registration of Agent service" screen to the services file. Check that the setting for the specified port number is applied and that the port number is not in use for other purposes.

```
#Service name  Port number/protocol name
sscruisera    4917/tcp
```

Point

- If the specified port number is already in use for other purposes, edit the C:\WINDOWS\system32\drivers\etc\services file manually and change to an unused port number.
- On Windows Server 2008, the firewall is active by default. For this reason, the port number settings on the side where the agents receive data must be configured so that communications can pass through the firewall. If a port number is modified, adapt these settings accordingly.

For Solaris, Linux, HP-UX or VMware environment

Enter the service name, the port number to be used, and the protocol name into the /etc/services file. The example below shows how to set "4917" for the port number to be used.

```
#Service name  Port number/protocol name
sscruisera    4917/tcp
```

Point

- If the specified port number is already in use for other purposes, change to an unused port number.

- If a firewall is active for a port number on the side where the agents receive data, the settings must be configured so that communications can pass through the firewall. If a port number is modified, adapt these settings accordingly.

6.1.2 Start IP address setting (Windows environment excluded)

In order to have Storage Cruiser's agent communicate with Storage Cruiser's manager on the correct LAN path, set the "Start IP address" as the IP address (IP address in the administrative LAN) to be used for data communication by the Managed Server.

For Solaris, Linux, HP-UX and VMware environments, set the Start IP address as described in below procedure.

For Windows environment, the Start IP address is already configured in the installation of Storage Cruiser's agent, making this procedure unnecessary.

1. If Storage Cruiser's agent is currently running, execute the following command to stop it:

```
# /opt/FJSSVssage/bin/pstorageagt
```

2. Configure the Start IP address in the Storage Cruiser's agent.

```
# /opt/FJSSVssage/bin/setagtip -i <IP address>
```



About setting values for the Start IP address

Depending on the IP address configuration on the Managed Server, make these settings as follows:

- If only one IP address is set up on the Managed Server, specify that IP address.
- If multiple IP addresses are set up on the Managed Server, select and specify a Start IP address from the network configuration of the Managed Server and the Management Server. Basically, you should specify an IP address that is set up in the LAN on the route side of the Management Server.
- In firewall and other environments applying IP address translation (e.g. NAT), do not set up the IP address of the server itself but an IP address that can receive transmissions from the Management Server.

6.1.3 SNIA HBA API library installation (HP-UX environment excluded)

For managing an HBA that is mounted on a Managed Server, it is necessary to install the SNIA HBA API library distributed by the HBA vendor.

Refer to the "ETERNUS SF Storage Cruiser 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/>

(This website offers various technical documentation and catalogs for Storage Cruiser.)

6.1.4 Correlation.ini file modification (Solaris environment only)

When an Oracle HBA is in use, it is necessary to modify the correlation.ini file that sets the details of the Storage Cruiser's agent using the following commands:

```
# cp -p /etc/opt/FJSSVssage/Correlation.ini /etc/opt/FJSSVssage/Correlation.ini.org
# cp -p /etc/opt/FJSSVssage/Correlation.ini.sun /etc/opt/FJSSVssage/Correlation.ini
```

The Oracle HBAs are as follows:

- XSEFC401AF and XSEFC402AF
- HBA model numbers starting with "SE0X7F" (excluding SE0X7F21F and SE0X7F22F)
- CNA model numbers starting with "SE0X7E"
- HBA model numbers starting with "SG-XPCI"

6.1.5 System rebooting (Windows environment excluded)

After completing the settings, reboot the system. Storage Cruiser's agent will start automatically.

The following are command examples for rebooting the system.

For Solaris environment

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

For Linux or VMware environment

```
# /sbin/shutdown -r now
```

For HP-UX environment

```
# /sbin/shutdown -r -y 0
```

6.1.6 Setting up End to End list display for Hyper-V(Windows environment only)

To display the End to End list for the VM guest on the Hyper-V host, set up the Hyper-V host with referring to "End to End list display" in "ETERNUS SF Storage Cruiser Operation Guide".

6.2 Setup of AdvancedCopy Manager's agent

This section explains how to set up AdvancedCopy Manager's agent.

6.2.1 Port number setting

For operation of the Managed Server (Storage Server), port numbers must be specified.

For Windows environment

This information reflects the port number that was entered during installation of AdvancedCopy Manager's agent, in "Port Registration" screen to the services file. Check that the setting for the specified port number is applied and that the port number is not in use for other purposes.

```
#Service name    Port number/protocol name
stgxfws          1226/tcp
```

 Point

If the specified port number is already in use for other purposes, edit the C:\WINDOWS\system32\drivers\etc\services file manually and change to an unused port number.

The table below shows the intended purposes of port numbers. If settings for port filtering are required, refer to the information stated in the "Purpose" column to check the objects to be connected to the ports before you make the settings.

Service name	Reception port	Purpose
Communication service	1226/tcp	Used for the followings: <ul style="list-style-type: none">- Communication with Management Server (Storage Management Server)- Communication with other Managed Servers for performing the replication between servers
Communication service for cluster transactions (NOTE)	Any-number/tcp	

NOTE: In a clustered system, this service is required for each transaction that is created during the cluster setup. The reception port is any port number that was specified for that transaction.

 Note

If, when you installed AdvancedCopy Manager's agent, you entered a port number other than the default one, replace the port number listed above by the one you actually entered.

For Solaris, Linux, HP-UX or AIX environment

Prepare the port numbers to be used on the Managed Servers and enter them into the /etc/services file.

The table below shows the intended purposes of port numbers. If settings for port filtering are required, refer to the information stated in the "Purpose" column to check the objects to be connected to the ports before you make the settings.

Service name	Reception port	Purpose
stgxfws	1226/tcp	Used for the followings: <ul style="list-style-type: none">- Communication with Management Server (Storage Management Server)- Communication with other Managed Servers for performing the replication between servers
stgxfws_logical_node_name (NOTE)	Any-number/tcp	

NOTE: In a clustered system, this service is required for each transaction that is created during the cluster setup. The *logical_node_name* is the name that was specified during the cluster setup, and the reception port is any port number that was specified for that transaction.

Enter the service name, the port number to be used, and the protocol name into the /etc/services file.

The example below shows how to set "1226" for the port number to be used.

```
#Service name  Port number/protocol name
stgxfws       1226/tcp
```

 Point

If the specified port number is already in use for other purposes, change to an unused port number.

6.2.2 ETERNUS Disk storage system setting verification

For using Advanced Copy functions of ETERNUS Disk storage system, the following setup for target ETERNUS Disk storage system is required. Check the details with a Fujitsu system engineer.

- Cache table size

6.2.3 Firewall setting (Windows environment only)

For the following operating systems, the firewall setting is required.

- Windows Server 2003 (If SP1 is installed)
- Windows Server 2003 R2
- Windows Server 2008
- Windows Server 2008 R2

Follow the steps in the procedure below to modify the firewall settings. Alternatively, disable the firewall.

For Windows Server 2008 R2

1. From the [Control Panel], click [Check firewall status] to open the [Windows Firewall] window.
2. On the left side pane, click [Advanced settings] to open the [Windows Firewall with Advanced Security] window.
3. In the list at the left of the window, select [Inbound Rules].
4. In the [Action] menu, select [New Rule] to open the [New Inbound Rule Wizard] window.
5. In the [Rule Type] step, select [Port], and then click the [Next] button.
6. In the [Protocol and Ports] step, select [TCP] and [Specific local ports:].
Enter the port number allocated to the communication service into the [Specific local ports:] text field, and then click the [Next] button.
7. In the [Action] step, select [Allow the connection], and then click the [Next] button.
8. In the [Profile] step, check [Domain], [Private] and [Public] depending on your network environment, and then click the [Next] button.
9. In the [Name] step, specify the [Name] and [Description] of the new rule as necessary, and then click the [Finish] button.
10. If you want to modify a scope, display the properties of the [Inbound Rules] for which to modify the scope.
Specify the permitted scope for communication with other servers that are not operating AdvancedCopy Manager on the [Scope] tab in the [Properties] window.
11. In the [Windows Firewall] window, click the [OK] button to finish your settings.

For operating systems other than Windows Server 2008 R2

1. From the [Control Panel], open the [Windows Firewall] window.
2. Click the [Add Port] button on the [Exceptions] tab to open the [Add Port] window.
3. Make the following settings for the communication service:
 - [name]: Specify any name
 - [Port number]: Specify the port number assigned to the communication service at the time of installation, and select "TCP" for the protocol.
4. If you want to modify a scope, display the properties of the [Inbound Rules] for which to modify the scope.
Specify the permitted scope for communication with other servers that are not operating AdvancedCopy Manager on the [Scope] tab in the [Properties] window.
5. Click the [OK] button in the [Add Port] window.

6. Click the [OK] button in the [Windows Firewall] window.

6.2.4 Start daemon (Windows environment excluded)

After completing the settings, start the daemon.

For the method of starting daemon, refer to "Starting Daemons" in the "ETERNUS SF AdvancedCopy Manager Operation Guide".

Chapter 7 Installation of AdvancedCopy Manager CCM

This chapter explains how to install AdvancedCopy Manager CCM.

Point

This chapter explains the tasks to be conducted for installing only the AdvancedCopy Manager CCM.

In the case you also want to use other products than the AdvancedCopy Manager CCM (e.g. Express and Storage Cruiser), refer to "[Chapter 3 Installation of ETERNUS SF Manager](#)".

7.1 Before installation

The following preparation work must be done before starting the installation of AdvancedCopy Manager CCM.

7.1.1 Available disk space verification

Make sure that there is enough available disk space on the server where the installation will be performed.

For information on the disk space required for installation, refer to "[2.5.3.1 Required disk space for installation](#)".

If there is not enough available disk space, perform any of the following actions in order to secure the disk space required for installation:

- Increase disks
- Reconfigure the disk partitions

7.1.2 Incompatible software uninstallation

Check if any incompatible software is installed on the server where the installation will be performed.

If the incompatible software is found, refer to that software manual and uninstall it before starting the installation.

7.2 Installation procedure of AdvancedCopy Manager CCM (for Windows)

There are two methods of performing the installation of AdvancedCopy Manager CCM for Windows.

- Default installation

The following configuration is used without the need to input any value.

- Installation destination

The "<System Drive>\ETERNUS_SF" directory is used as the base location for the Program Directory, Environment Directory and Work Directory.

- Custom installation

Installation is done by entering the configuration information on the screen (installation destination).

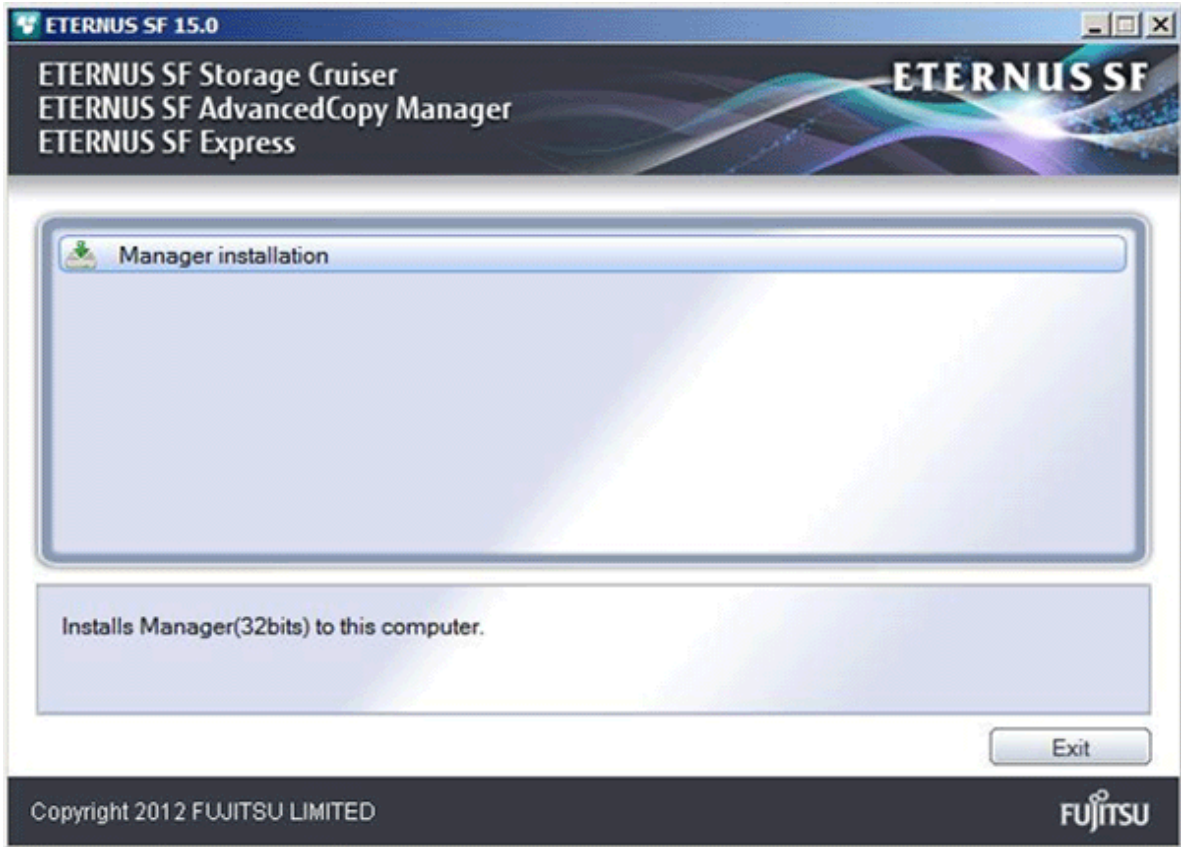
Note

Use DVD-ROM to install AdvancedCopy Manager CCM.

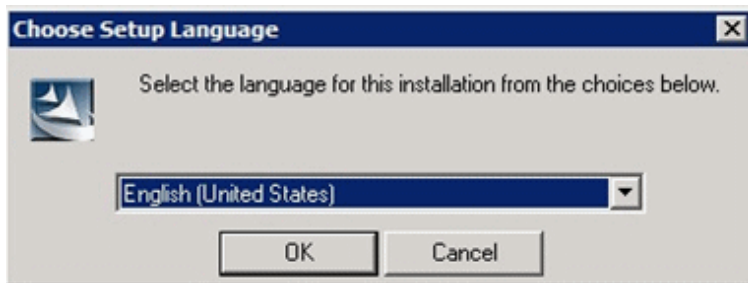
Do not copy DVD-ROM contents to a local directory for installing.

The installation procedure of AdvancedCopy Manager CCM is performed as follows:

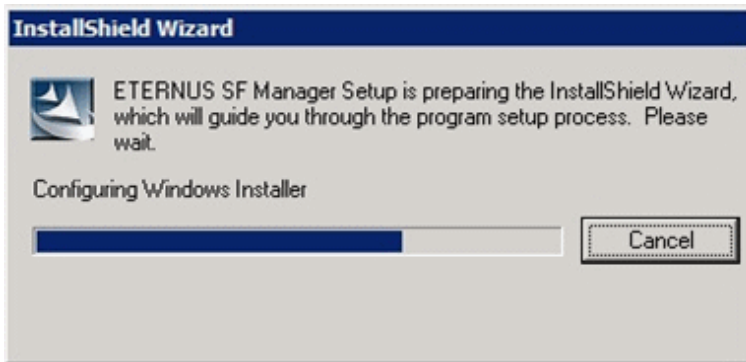
1. Using an account with Administrator privileges, log in the server where the installation will be performed.
2. Insert the DVD-ROM "ETERNUS SF SC/ACM/Express V15.0 Mediapack for Windows (Manager Program)" into the DVD-ROM drive.
3. The following screen is displayed. Click the [Manager installation] button.
To cancel the installation at this point, click the [Exit] button.



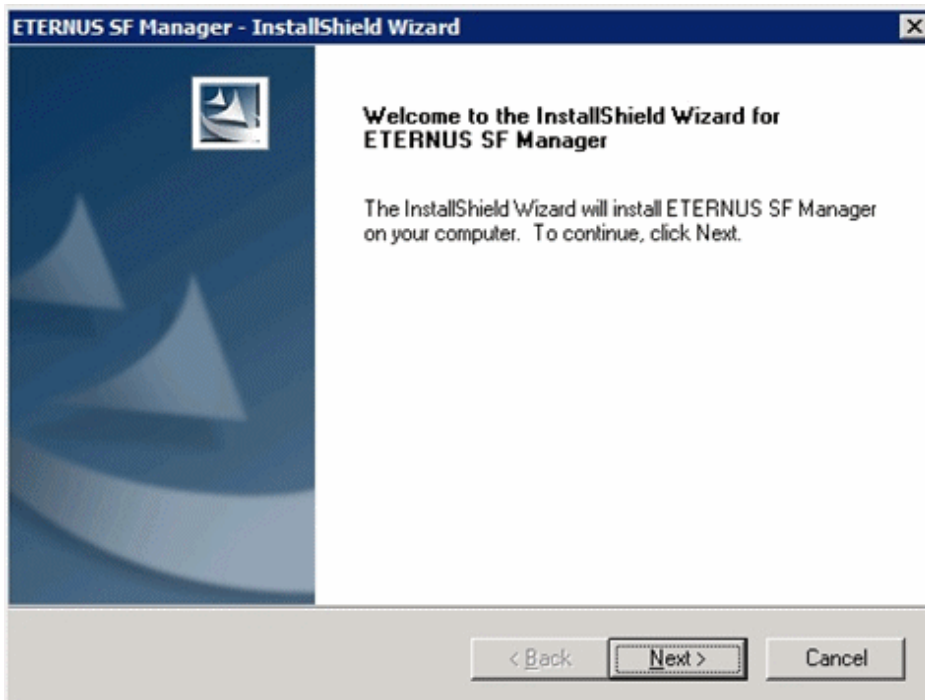
4. The [Choose Setup Language] screen is displayed. Select the language to be used for the installation and click the [OK] button.
The language selected in this screen is used during the installation, and also during the uninstallation.



5. The following screen is displayed. To cancel the installation at this stage, click the [Cancel] button.

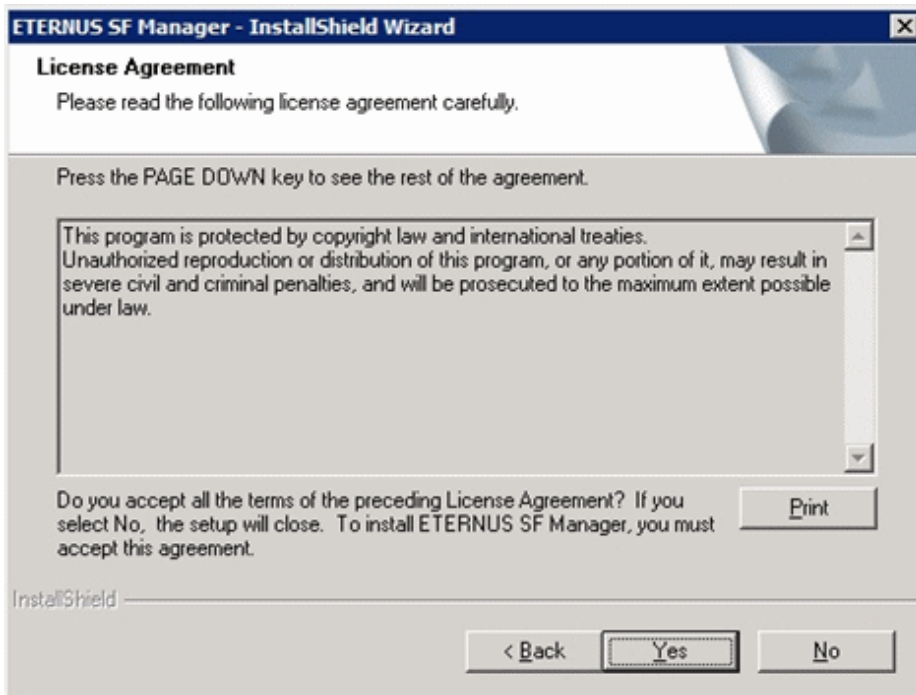


6. The following screen is displayed. After checking the screen contents, click the [Next] button.

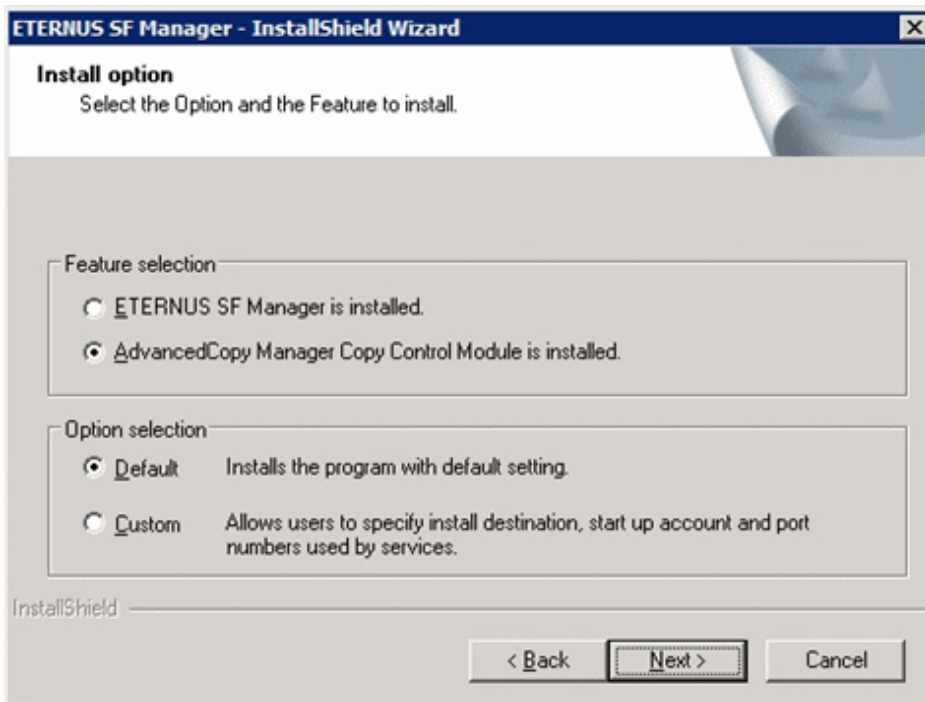


7. Read the terms and conditions in the [License Agreement] screen.

After reading the contents, if the conditions are agreed click the [Yes] button.



8. Select the functions to install and the options in the [Install option] screen.



Feature selection

Select [AdvancedCopy Manager Copy Control Module is installed.].
The component configured AdvancedCopy Manager CCM is installed.

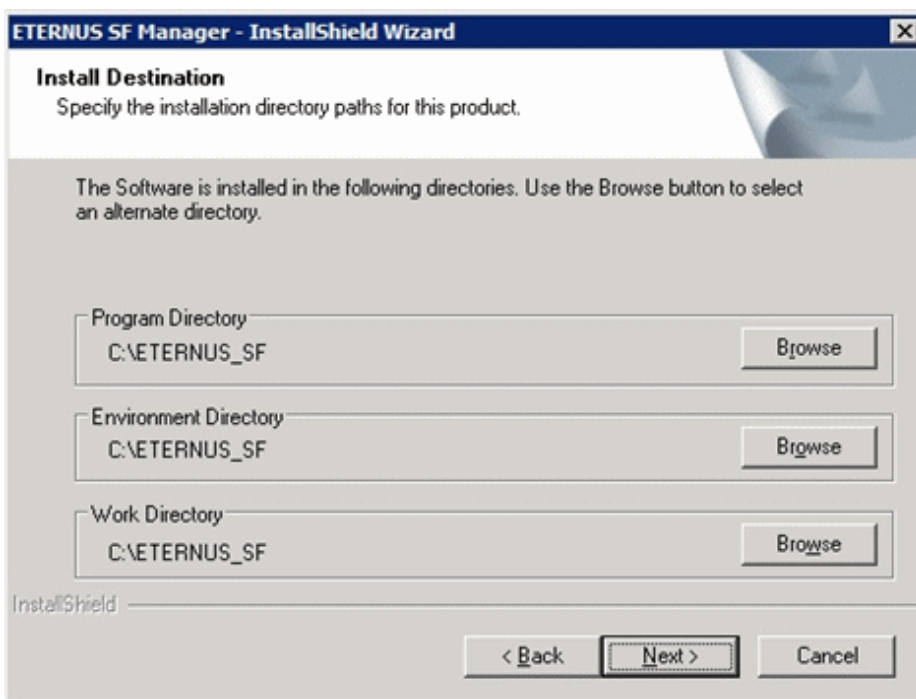
Option selection

Select the desired options according to the following information.

Install option	Explanation
Default	<p>Changing values in the [Installation Destination] screen is optional and can be omitted. In that case, step 9 can be skipped.</p> <p>In this installation method, the following checks are automatically performed regarding the information provided as a default:</p> <ul style="list-style-type: none"> - Is there enough disk space for the installation in the default directory? <p>If an error is detected at this stage, a warning dialog is displayed. If no error is detected, the [Start Copying Files] screen is displayed.</p>
Custom	The installation information must be entered in the screens from step 9.

9. Specify the installation directory in the [Installation Destination] screen.

If installing to a directory other than the directory displayed by default, click the [Browse] button and change the install location. After designating all of the directories, click the [Next] button.



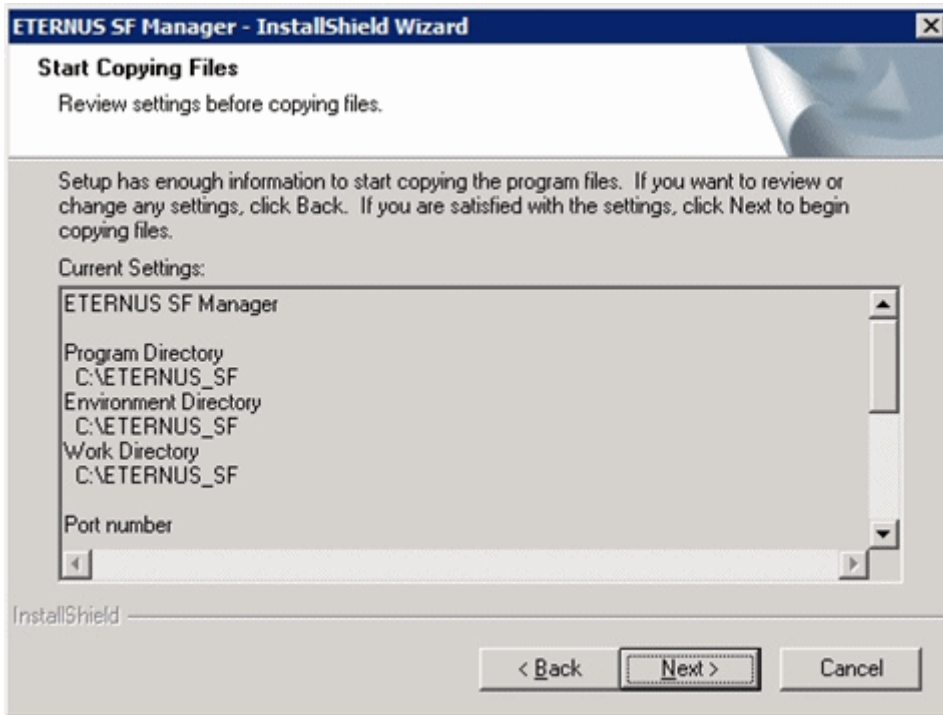
Note

- Do not specify the shared directory as the installation directory.
- The blank space and the following characters [" | : * ? / . < > , % & ^ = ! ;] cannot be used in directory names.
- The number of characters in a directory name must be between 4 and 70.

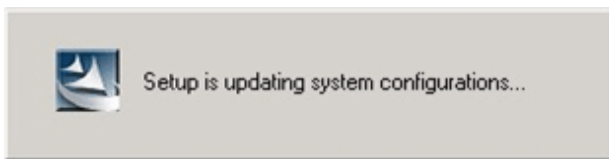
10. Check the settings information in the [Start Copying Files] screen.

If the settings are correct, click the [Next] button.

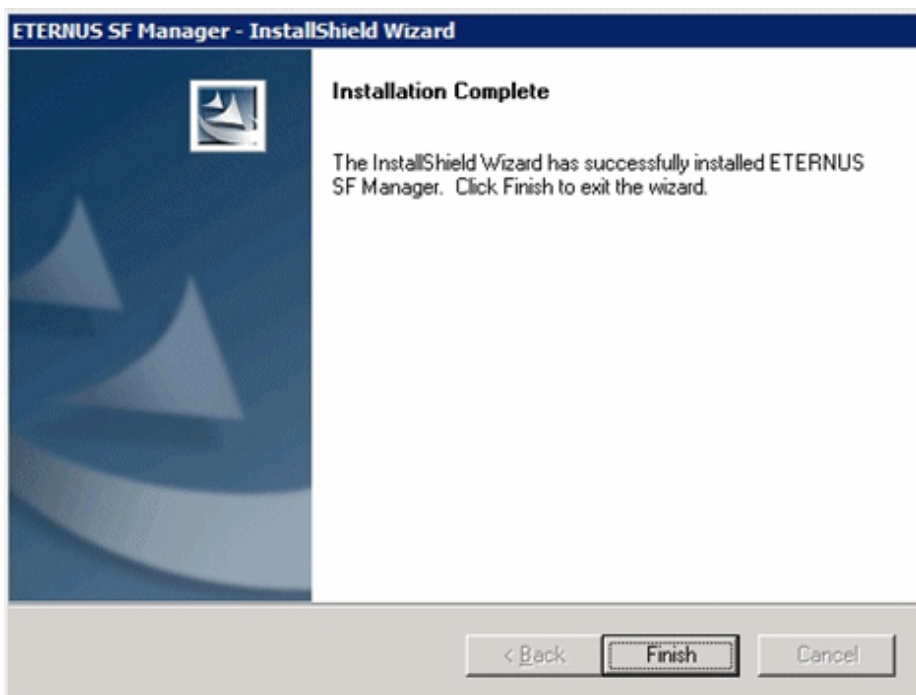
To go back and change a setting, click the [Back] button.



11. Copying of the program is started.
During the process, the file copy completion status is displayed in the [Setup Status] screen.
12. Once the copy process ends, the system configuration is updated. Wait for the configuration update process to finish.



13. The following screen is displayed. The installation process is finished, click the [Finish] button.



14. Eject the DVD-ROM from the DVD-ROM drive.

The installation of AdvancedCopy Manager CCM (for Windows) is completed.

7.3 Installation procedure of AdvancedCopy Manager CCM (for Solaris)

The installation procedure of AdvancedCopy Manager CCM for Solaris is performed as follows:

1. Log in as "root (super user)" on the server on which to install AdvancedCopy Manager CCM.
2. Make sure that the local file system is mounted.
If the local file system is not mounted, execute the following command to mount the local file system:

```
# /usr/sbin/mountall -l
```

3. Insert the DVD-ROM "ETERNUS SF SC/ACM V15.0 Mediapack for Solaris (Manager Program)" to the DVD-ROM drive.
4. Mount the DVD-ROM.

In below example of command execution, the device name of the DVD-ROM drive is mounted as /dev/dsk/c0t4d0s0. Name of DVD-ROM drive is depending on the device.

```
# mount -F hsfs -o ro /dev/dsk/c0t4d0s0 <DVD-ROM mount point>
```

5. Change directory in which the install shell is stored.

```
# cd <DVD-ROM mount point>/Manager_unix
```

6. Specify the install parameter file, and execute the command for installation.

The install parameter file is stored in the same directory in which the install shell is stored. However, specify the install parameter file by using absolute path.

```
# ./esfinstall.sh -s absolute path name for the install parameter file
```

The absolute path name for install parameter file is as follows:

```
<DVD-ROM mount point>/Manager_unix/install_parameter_ccm.txt
```

7. Installation information is displayed.

To continue installation, enter "y". To stop the installation, enter "q".

```
+-----+
|           ETERNUS SF V15.0           |
|                                       |
| All Rights Reserved, Copyright (C) FUJITSU LIMITED 2012 |
+-----+

Setting of installation parameter file.

Install_function:      ETERNUS SF AdvancedCopy Manager CCM

Do you want to continue the installation? [y,q]:
```

8. After installation is completed successfully, the following message is displayed.

```
INFO: ETERNUS SF was installed successfully.
```

If an error occurs during installing, the following message is displayed and no AdvancedCopy Manager CCM files are installed.

- When FJSVccm, for example, is already installed.

```
ERROR: The following product has been already installed on this system.:
      ETERNUS SF AdvancedCopy Manager Copy Control Module

ERROR: Installation has failed.
```

Way of handling: Uninstall the installed software (In this case, FJSVccm).

9. Change directory into other than DVD-ROM. The example is shown below.

```
# cd
```

10. Unmount the DVD-ROM.

```
# umount <DVD-ROM mount point>
```

11. Eject the DVD-ROM from the DVD-ROM drive.

Installation for AdvancedCopy Manager CCM (for Solaris) is completed.

7.4 Installation procedure of AdvancedCopy Manager CCM (for Linux)

The installation procedure of AdvancedCopy Manager CCM for Linux is performed as follows:

1. Log in as "root (super user)" on the server on which to install AdvancedCopy Manager CCM.
2. Make sure that the local file system is mounted.
If the local file system is not mounted, execute the following command to mount the local file system:

```
# /usr/sbin/mountall -l
```

3. Insert the DVD-ROM "ETERNUS SF SC/ACM/Express V15.0 Mediapack for Linux (Manager Program)" or "ETERNUS SF SC/ACM/Express V15.0 Mediapack for Linux 64bit (Manager Program)".
4. Mount the DVD-ROM.

```
# mount /dev/cdrom <DVD-ROM mount point>
```

5. Change directory in which the command for installation is stored.

```
# cd <DVD-ROM mount point>/Manager_unix
```

6. Specify the install parameter file, and execute the command for installation.
The install parameter file is stored in the same directory in which the install shell is stored. However, specify the install parameter file by using absolute path.

```
# ./esfinstall.sh -s absolute path name for the install parameter file
```

The absolute path name for install parameter file is as follows:

```
<DVD-ROM mount point>/Manager_unix/install_parameter_ccm.txt
```

7. Installation information is displayed.
To continue installation, enter "y". To stop the installation, enter "q".

```
+-----+
|               ETERNUS SF V15.0               |
+-----+
```



```
|
| All Rights Reserved, Copyright (C) FUJITSU LIMITED 2012
+-----+
Setting of installation parameter file.

Install_function:      ETERNUS SF AdvancedCopy Manager CCM

Do you want to continue the installation? [y,q]:
```

8. After installation is completed successfully, the following message is displayed.

```
INFO: ETERNUS SF was installed successfully.
```

If an error occurs during installing, the following message is displayed and no AdvancedCopy Manager CCM files are installed

- When FJSVccm, for example, is already installed.

```
ERROR: The following product has been already installed on this system.:
      ETERNUS SF AdvancedCopy Manager Copy Control Module

ERROR: Installation has failed.
```

Way of handling: Uninstall the installed software (In this case, FJSVccm).

9. Change directory into other than DVD-ROM. An example is shown below.

```
# cd
```

10. Unmount the DVD-ROM and eject the DVD-ROM.

```
# umount /dev/cdrom
# eject cdrom
```

Installation for AdvancedCopy Manager CCM (for Linux) is completed.

Chapter 8 Setup of AdvancedCopy Manager CCM

This chapter explains how to set up AdvancedCopy Manager CCM.

8.1 Configuring the network environment

In order to enable the server on which the AdvancedCopy Manager CCM is installed (hereafter referred to as "CCM Server") to communicate with the ETERNUS Disk storage systems to be managed, configure the ETERNUS network environment. Refer to the ETERNUS Web GUI manual for information on how to configure the ETERNUS network environment.

When setting up firewall between CCM Server and ETERNUS Disk storage system

If you set up a firewall between the CCM server and ETERNUS Disk storage system, specify below port numbers so as to enable transmissions to pass the firewall.

The port numbers depend on the model of ETERNUS Disk storage system.

Item to be set	For using ETERNUS Disk storage system that can be operated by Copy command via LAN	For using ETERNUS Disk storage system that cannot be operated by Copy command via LAN
Port number	1372 50002	1999
Protocol	tcp	
Communication start direction	From the CCM Server to ETERNUS Disk storage system	

For using both types of ETERNUS Disk storage system, some that can and some that cannot be operated by Copy command via LAN, make both settings.

For details of ETERNUS Disk storage system models that can be operated by Copy command via LAN, refer to "[Table 2.4 ETERNUS Disk storage system supporting Copy command via SAN and via LAN](#)".

8.2 Creating user account for using AdvancedCopy Manager CCM

This section explains how to create user accounts with the privileges that are required for using the AdvancedCopy Manager CCM.

8.2.1 For Windows Server 2003

When using AdvancedCopy Manager CCM on Windows Server 2003, operate as a user with Administrator permissions or a user in the Administrators group.

8.2.2 For Windows Server 2008 or Windows Server 2008 R2

In Windows Server 2008 and Windows Server 2008 R2, a User Account Control function (hereafter called "UAC") has been added to enhance security.

Cases where UAC is enabled and disabled are explained below.

- When UAC is enabled

When any user other than the built-in Administrator account (including accounts in the Administrator group) executes a process or program that requires administrator permissions, the "Permissions granted/authorized dialog" is displayed. Permissions granted or authorized must be confirmed.

- When UAC is disabled

Processes or programs that require administrator permissions must be executed by either the built-in Administrator account or a user account in the Administrators group.

The operating conditions are shown below.

Table 8.1 Relationship between account and UAC

Account type	UAC: Enabled	UAC: Disabled
Built-in Administrator account	A	A
User account in the Administrator group	B	A
Standard user account	B	C

A: Runs without displaying the permissions granted dialog.

B: Displays the permissions granted dialog, and runs if permissions are approved.

C: Does not run, because Administrator permissions cannot be obtained.

If you do not wish to perform the dialog process using the administrator permissions dialog, and the conditions marked as "B" in the table above apply (for example, in batch processing), the program must be executed using administrator permissions with one of the following methods:

- In the Command Prompt, use the runas command to execute the program as a user with administrator permissions or the permissions required to operate AdvancedCopy Manager CCM. A password must be entered.

[Batch file (test.bat) execution example]

```
runas /noprofile /user:mymachine\acmuser "cmd.exe /k test.bat"
```

- In the Task Scheduler, specify "Execute with top level privileges" to operate the program.
- From the [Start] menu, select [All Programs] - [Accessories] and right-click on [Command Prompt]. Specify "Run as Administrator" to run the Command Prompt. Execute the program from the Command Prompt.

8.2.3 For Solaris or Linux

When using AdvancedCopy Manager CCM in Solaris environment or Linux environment, operate as a "root (super user)".

8.3 Setting PATH environment variable

To execute AdvancedCopy Manager CCM commands, it is necessary to add the "bin" directory of the AdvancedCopy Manager CCM to the PATH environment variables.

For Windows environment

- For Windows Server 2003:
 1. Right-click on [My Computer] on the [Start] menu, and select the [Properties] from the pop-up menu.
 2. Click [Advanced] tab in the [System Properties] dialog, and then click the [Environment Variables] button.
 3. Add the following value to PATH environment variable.

```
<Installation directory of program>\CCM\bin
```

- For Windows Server 2008 or Windows Server 2008 R2:
 1. Right-click on [Computer] on the [Start] menu, and select the [Properties] from the pop-up menu.

2. Click [Advanced system settings] on the left side of [System] dialog.
3. Click [Advanced] tab in the [System Properties] dialog, and then click the [Environment Variables] button.
4. Add the following value to PATH environment variable.

```
<Installation directory of program>\CCM\bin
```

Point

.....
When listing multiple directories, separate them with semicolons (;).
.....

For Solaris environment or Linux environment

When using Bourne shell, add a value to PATH environment variable as below.

```
# PATH=$PATH:/opt/FJSVccm/bin  
# export PATH
```

Point

.....
When listing multiple directories, separate them with semicolons (;).
.....

Chapter 9 Uninstallation of ETERNUS SF Manager

This chapter explains methods for uninstallation of ETERNUS SF Manager.

9.1 Before uninstallation

The following preparation work must be done before starting the uninstallation of ETERNUS SF Manager.



Information

It is not necessary to stop the ETERNUS SF Manager services before starting the uninstallation of ETERNUS SF Manager. The ETERNUS SF Manager uninstaller will stop the ETERNUS SF Manager services before it removes the programs.

9.1.1 Backup of ETERNUS SF Manager environment

If there is a possibility that the current environment will be used again, e.g. after migration, back up (save) the ETERNUS SF Manager environment as needed.

Use the following manuals as reference for saving the ETERNUS SF Manager environment.

- For Express:
"Backing up Express's manager environment" in the "ETERNUS SF Express Operation Guide"
- For Storage Cruiser:
"Backup of Manager" in the "ETERNUS SF Storage Cruiser Operation Guide"
- For AdvancedCopy Manager:
"Operation Maintenance" in the "ETERNUS SF AdvancedCopy Manager Operation Guide"

9.1.2 Backup of backup management list

If ETERNUS SF Manager is uninstalled, the backup management list of AdvancedCopy Manager will also be deleted.

Under any of the following circumstances, you should back up the backup management list before starting the uninstallation of ETERNUS SF Manager.

- If you performed the backup operation of AdvancedCopy Manager on a Management Server (Storage Management Server)
- If there is a possibility that the backup management list will be used again

For backing up the backup management list, execute the `swstresback` command.

For details on the command, refer to "swstresback (Resource backup command)" in the "ETERNUS SF AdvancedCopy Manager Operation Guide" for the operating system of the Management Server.

9.1.3 Deletion of Managed Servers

If AdvancedCopy Manager was used, all Managed Servers (Storage Server) under the Management Server (Storage Management Server) from which ETERNUS SF Manager is uninstalled must be removed from the control of AdvancedCopy Manager.

There are two methods for this task:

- Using the Web Console

- Executing the stgxfwcmdelrv command on the Management Server

For details on the command, refer to "stgxfwcmdelrv (Server information deletion command)" in the "ETERNUS SF AdvancedCopy Manager Operation Guide" for the operating system of the Management Server.

Point

.....
If AdvancedCopy Manager was not used, this task is not necessary.
.....

9.1.4 Backup of pre-processing and post-processing scripts

If ETERNUS SF Manager is uninstalled, AdvancedCopy Manager's pre-processing and post-processing scripts (shell scripts) used in backup/restore and replication will also be deleted.

Under any of the following circumstances, you should back up the scripts before starting the uninstallation of ETERNUS SF Manager.

- If you performed the backup/replication operation of AdvancedCopy Manager on a Management Server (Storage Management Server)
- If there is a possibility that the customized scripts will be used again

9.1.5 Unsetup of database (for Windows)

In order to delete the database, database environment and the repository settings, perform the database unsetup.

Note

-
- For systems that were in cluster operation, this task is unnecessary because the settings have been cleared during the deletion of the Management Server transaction (Storage Management Server transaction).

You should, however, clear the settings according to the instructions in "Deletion of Cluster Environment for Management Server Transactions" or "Deletion of Cluster Environment for Managed Server Transactions" in the "ETERNUS SF Cluster Environment Setup Guide". If you uninstall without clearing the settings, uninstallation processing will terminate prematurely with an error.

- For using Terminal Service (via a remote desktop connection)

If the operating system of the Management Server is Windows Server 2003, the Terminal Service must connect to the console session (ID 0). Refer to the following links for information on how to make console session connections:

- <http://support.microsoft.com/kb/947723>
- <http://support.microsoft.com/kb/278845>

- Do not use the telnet server service for performing the database unsetup, as it will not work properly.
 - The database unsetup uses Symfoware functions. If other software is used to perform Symfoware monitoring, database unsetup may fail. Therefore, stop Symfoware monitoring before performing executing the database unsetup.
-

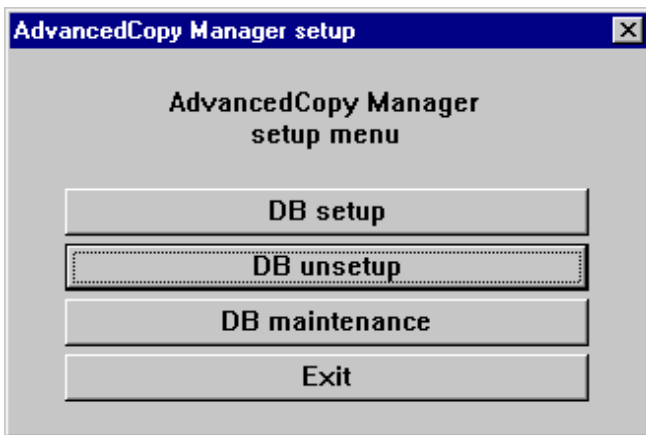
Point

.....
For performing the database unsetup, you must be logged on as the user who was specified when setting the database information (i.e. the user who was set in step 15 of the "3.2 Installation procedure of ETERNUS SF Manager (for Windows)").
.....

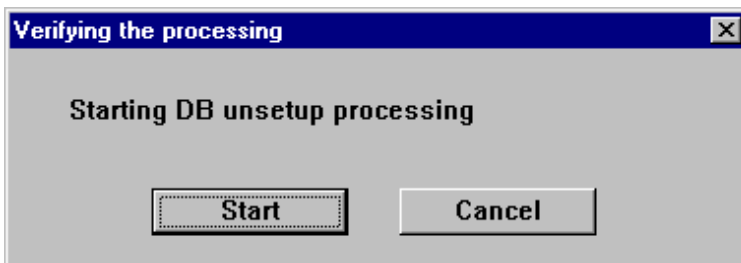
The procedure is as follows:

1. Click [Start] -> [Programs] -> [ETERNUS SF Manager] -> [DB setup tool].

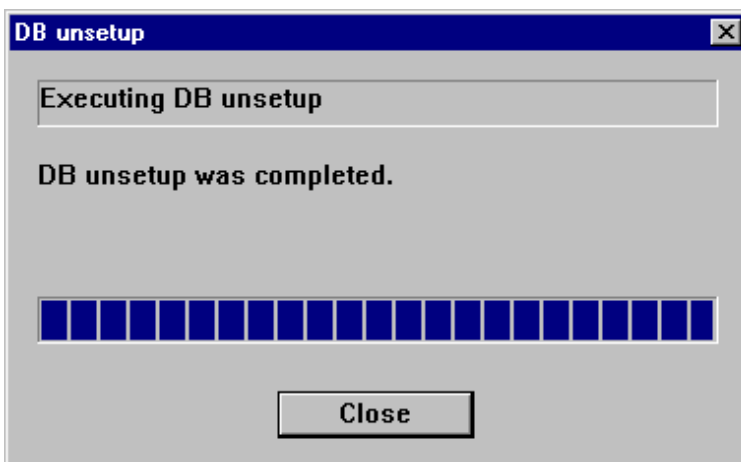
2. The following screen is displayed. Click the [DB unsetup] button.



3. The following verification screen is displayed. Click the [Start] button.



4. When database unsetup is completed, the following screen is displayed. Click the [Close] button to close the screen.



5. Finish DB unsetup by clicking the [Exit] button on the screen displayed in step 2.

The procedure is completed.

9.1.6 Cancel of repository settings (for Solaris and Linux environment)

Start uninstall of the database integration.

Delete the database and its environment.

Cancel the repository configurations.

Note

- When the Server is being operated on the cluster system, the repository configurations are cancelled when Management Server transaction (Storage Management Server transaction) are deactivated and removed. Therefore, it is not necessary to carry out this operation.
- Perform this operation under the locale specified when you installed ETERNUS SF Manager. However, when Symfoware is installed in advance, perform this operation under the locale specified at the time of installing Symfoware.
- DB unsetup uses Symfoware functions. If other software is used to perform Symfoware monitoring, DB unsetup may fail. Therefore, stop Symfoware monitoring before executing DB unsetup.

The procedure is shown below.

1. Log in as a "root (super user)" in the server.
2. Enter the following command to start uninstall of the database integration:

```
# /opt/swstorage/bin/stgdbunset
```

3. The following screen is displayed. To continue processing, enter "y." To stop processing, enter "n."

```
////////////////////////////////////
AdvancedCopy Manager Storage management server ( kiku )
Database unsetup
////////////////////////////////////

+-----+
|
| All of database environments of AdvancedCopy Manager
| will be deleted.
|
| [Notes]
| Once processing has started, all stored data is discarded.
| Make sure that the environment allows execution
| before proceeding.
|
+-----+

Do you want to continue with processing? [y/n] ==>
```

4. Deletion of Management Server database is executed, the actions are displayed on the screen.

Point

If an RDA-SV definition file overwrite confirmation message is displayed on the screen during processing, enter "y".

```
///// AdvancedCopy Manager database unsetup /////

Activation of RDB is complete.
=====
The replication management will be deleted.
=====

=====
Clearing of database will start. (replication management)
=====

.
```



```

Tables have been deleted. (replication management)
=====
Clearing of database is complete. (replication management)
=====

=====
The replication management has been deleted.
=====

:

=====
Clearing of database environment is complete.
=====

=====
The basic section has been deleted.
=====

Database unsetup ended normally.

```

Cancel of repository settings is completed.

9.1.7 Deletion of the port number

From the services file, delete the port numbers that were used by services/daemon of ETERNUS SF Manager. Usually, the services file is on the following path:

OS type	Path name
Windows	C:\WINDOWS\system32\drivers\etc\services
Solaris Linux HP-UX AIX	/etc/services

For the port numbers to be deleted, refer to the following sections:

- If the installation method was default installation:
Port numbers listed in "[Table 3.5 Services and port numbers of ETERNUS SF Manager for Windows \(default\)](#)"
- If the installation method was custom installation:
Port numbers entered in step 10 of the "[3.2 Installation procedure of ETERNUS SF Manager \(for Windows\)](#)"

9.1.8 Eject the media

Make sure that "ETERNUS SF SC/ACM/Express V15.0 Mediapack" is not in a DVD-ROM.

When the media is in the DVD-ROM, eject it from the DVD-ROM drive.



An unexpected error may occur, when the media is left in the DVD-ROM drive.

9.2 Uninstallation procedure of ETERNUS SF Manager (for Windows)

Note

Using the following service for uninstallation requires caution.

- Terminal Service (via a remote desktop connection)

If the operating system of the Management Server is Windows Server 2003, the Terminal Service must connect to the console session (ID 0). Refer to the following links for information on how to make console session connections:

- <http://support.microsoft.com/kb/947723>
- <http://support.microsoft.com/kb/278845>

The uninstallation procedure of ETERNUS SF Manager for Windows is performed as follows:

1. Using an account with Administrator privileges, log in the server where the uninstallation will be performed.
2. Start the uninstaller.

This can be done by either of the following methods:

- Click [Start] -> [All Programs] -> [ETERNUS SF Manager] to open the menu and then click [Uninstall].
- From the Control Panel, open the screen to remove programs and give the instruction to remove ETERNUS SF Manager.

- For Windows Server 2003

From the Control Panel, open the [Add or Remove Programs] screen.

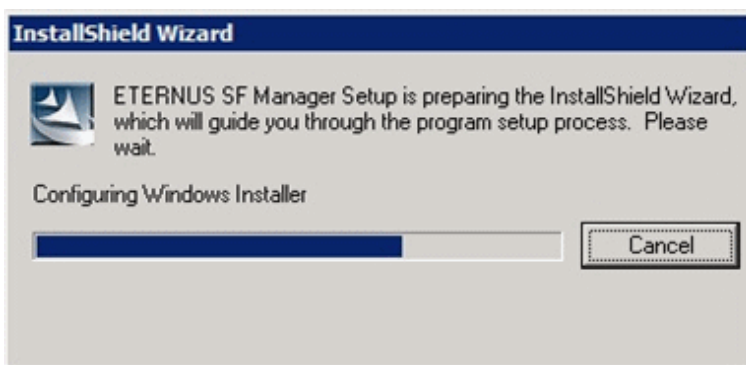
From the list of displayed programs, select "ETERNUS SF Manager" and then click the [Change/Remove] button.

- For Windows Server 2008 or Windows Server 2008 R2

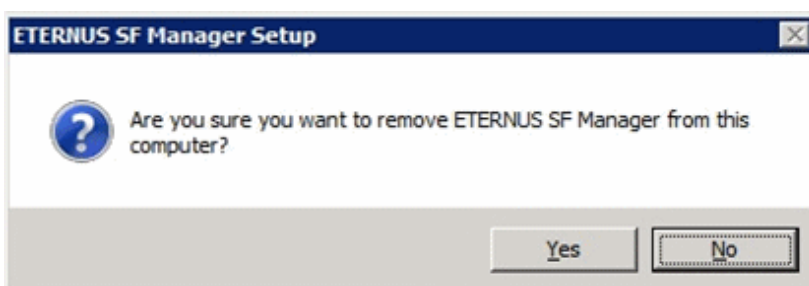
From the Control Panel, open the [Programs and Features] screen.

From the list of displayed programs, select "ETERNUS SF Manager" and then click the [Uninstall] button.

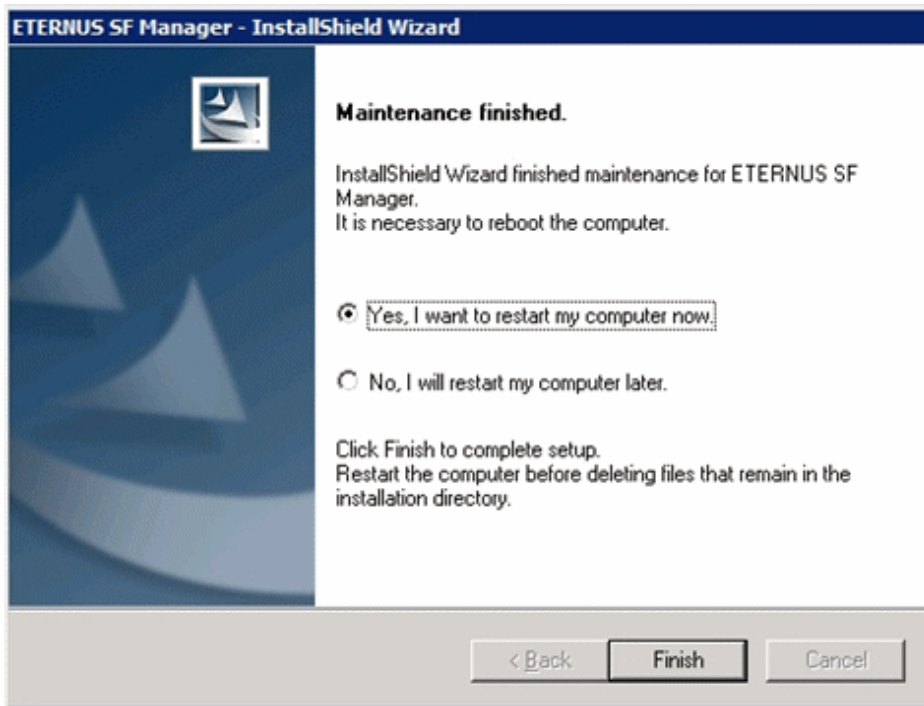
3. The following screen is displayed. To cancel the uninstallation at this stage, click the [Cancel] button.



4. The following verification screen is displayed. Click the [Yes] button.



5. When the uninstallation processing is complete and the following screen is displayed, click the [Finish] button.



6. Restart the system.

7. Delete the agent management information.

Use Explorer or another application to delete all files under *<Environment directory>*\etc after backing up (saving) any files as necessary.

The uninstallation of ETERNUS SF Manager (for Windows) is completed.

Information

The install destination directory is not deleted after ETERNUS SF Manager because of remaining Symfoware resources. Delete the install destination directory according to the following procedure.

1. Be sure that no other products (such as Systemwalker Centric Manager, or similar) are using Symfoware.
2. Uninstall Symfoware using [Add or Remove Programs] or [Programs and Features] screen.
If both Symfoware Server and Symfoware Client are installed, uninstall Symfoware Client first.
3. Delete the install destination directory.
Use Explorer or another application to delete the directory manually.
By default, the installation directory is "C:\ETERNUS_SF".

9.3 Uninstallation procedure of ETERNUS SF Manager (for Solaris)

The uninstallation procedure of ETERNUS SF Manager for Solaris is performed as follows:

1. Log in as a "root (super user)" in the server.
2. Uninstall ETERNUS SF Manager using the following command:

```
# /opt/FJSVesfcm/esinstaller/esfuninstall.sh
```

3. The following screen is displayed. To continue the uninstallation, enter "y". To stop the uninstallation, enter "q".

```
+-----+
|                                     |
|               ETERNUS SF V15.0     |
|                                     |
| All Rights Reserved, Copyright (C) FUJITSU LIMITED 2012 |
|                                     |
+-----+

The following product has been installed on this system:
    ETERNUS SF Manager

Do you want to continue the uninstallation? [y,q]:
```

4. The relevant packages are deleted, and execution result is displayed. The following message is displayed after the uninstallation of ETERNUS SF Manager is completed normally.

```
INFO: ETERNUS SF was uninstalled successfully.
```

5. Start the uninstaller of Symfoware to delete the Symfoware package. Before deleting the package, confirm that none of the package functions used by any system other than ETERNUS SF Manager.

```
# /opt/symfoware/setup/symfo_remove
```

6. Confirmation message to uninstall Symfoware is displayed. To perform the uninstallation, enter "all" or "y". To cancel the process, enter "n". Enter "y" in response to the second confirmation message.

```
Is removal started? (all:all packages y:except common packages n:end (default:n) [all,y,n]:
all
Removal of all packages, Ok? (default:n) [y,n]: y
```

7. The following message is displayed after the uninstallation of Symfoware is completed normally.

```
Removal of "Symfoware Server Enterprise Edition" was successful.
```

8. Delete the FSUNiconv package. Before deleting the package, confirm that none of the package functions used by any system other than ETERNUS SF Manager.

```
# pkgrm FSUNiconv
```

9. Reboot the system.

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

The uninstallation of ETERNUS SF Manager (for Solaris) is completed.

Information

.....
Delete the "/var/opt/FJSVesflm" directory manually, if the directory still exists after ETERNUS SF Manager is uninstalled.
.....

9.4 Uninstallation procedure of ETERNUS SF Manager (for Linux)

The uninstallation procedure of ETERNUS SF Manager for Linux is performed as follows:

1. Log in as a "root (super user)" in the server.

2. Uninstall ETERNUS SF Manager using the following command:

```
# /opt/FJSVesfcm/esinstaller/esfuninstall.sh
```

3. The following screen is displayed. To continue the uninstallation, enter "y". To stop the uninstallation, enter "q".

```
+-----+
|                ETERNUS SF V15.0                |
|                                                  |
| All Rights Reserved, Copyright (C) FUJITSU LIMITED 2012 |
+-----+

The following product has been installed on this system:
  ETERNUS SF Manager

Do you want to continue the uninstallation? [y,q]:
```

4. The relevant packages are deleted, and execution result is displayed.
The following message is displayed after the uninstallation of ETERNUS SF Manager is completed normally.

```
INFO: ETERNUS SF was uninstalled successfully.
```

5. Start the uninstaller of Symfoware to delete the Symfoware package.
Before deleting the package, confirm that none of the package functions used by any system other than ETERNUS SF Manager.

```
# /opt/symfoware/setup/symfo_remove
```

6. Confirmation message to uninstall Symfoware is displayed.
To perform the uninstallation, enter "all" or the "number of the function".
Enter "y" in response to the second confirmation message. To continue the uninstallation, enter "y". To stop the uninstallation, enter "q".

An example of uninstallation with the specification "all":

```
Uninstallation of "Symfoware Server Enterprise Edition" begins.

Please select the functions to be uninstalled.
1: RDB function
2: JDBC function
3: WebAdmin function
4: WebDBtools function
Separate multiple selections with ",". (Example: 1, 2)
[all:All functions,1,2,3,4,q]: all

Selected functions
- RDB function
- JDBC function
- WebAdmin function
- WebDBtools function

Start the uninstallation of the above functions?
y: Uninstallation begins
n: Select the functions again
q: End directly without uninstallation
[y,n,q]: y

Uninstallation begins.
```

7. The following message is displayed after the uninstallation of Symfoware is completed normally.

```
Uninstallation of "Symfoware Server Enterprise Edition" is ended normally.
```

8. Reboot the system

```
# /sbin/shutdown -r now
```

The uninstallation of ETERNUS SF Manager (for Linux) is completed.

Information

.....
Delete the "/var/opt/FJVSesflm" directory manually, if the directory still exists after ETERNUS SF Manager is uninstalled.
.....

Chapter 10 Uninstallation of ETERNUS SF Agent

This chapter explains how to uninstall Storage Cruiser's agent and AdvancedCopy Manager's agent.

10.1 Uninstallation of Storage Cruiser's agent

This section explains how to uninstall Storage Cruiser's agent.

10.1.1 Before uninstallation

The following preparation work must be done before starting the uninstallation of Storage Cruiser's agent.

10.1.1.1 Stopping services/daemons

Perform the tasks described below to stop the service/daemon of the Storage Cruiser's agent to be uninstalled.

For Windows environment

1. Click [Control Panel] -> [Administrative Tools] -> [Services] to display the [Services] screen.
2. Select "ETERNUS SF Storage Cruiser Agent" and click the [Stop] button.

For Solaris, Linux, HP-UX or VMware environments

1. Execute the following command to stop the daemon:

```
# /opt/FJSVssage/bin/pstorageagt
```

2. Execute the following command to confirm that the daemon has stopped:

- For Solaris or HP-UX environments:

```
# /usr/bin/ps -ef | grep FJSVssage
```

- For Linux or VMware environments:

```
# /bin/ps -ef | grep FJSVssage
```

3. If the daemon has not stopped, execute the following command to stop the daemon forcibly:

```
# /usr/bin/kill -9 <Process ID of daemon>
```

10.1.2 Uninstallation procedure of Storage Cruiser's agent (for Windows)

The uninstallation procedure of Storage Cruiser's agent (for Windows) is performed as follows:

1. Using an account with Administrator privileges, log on the server where the uninstallation will be performed.
2. Perform the following tasks.
 - For Windows Server 2003

From the Control Panel, open the [Add or Remove Programs] screen.

From the list of displayed programs, select "ETERNUS SF Storage Cruiser Agent" and then click the [Change/Remove] button.

- For Windows Server 2008 or Windows Server 2008 R2

From the Control Panel, open the [Programs and Features] screen.

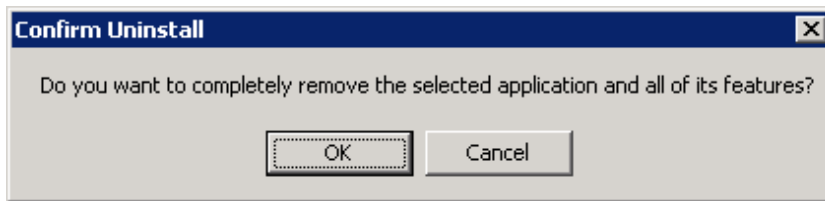
From the list of displayed programs, select "ETERNUS SF Storage Cruiser Agent" and then click the [Uninstall] button.

Information

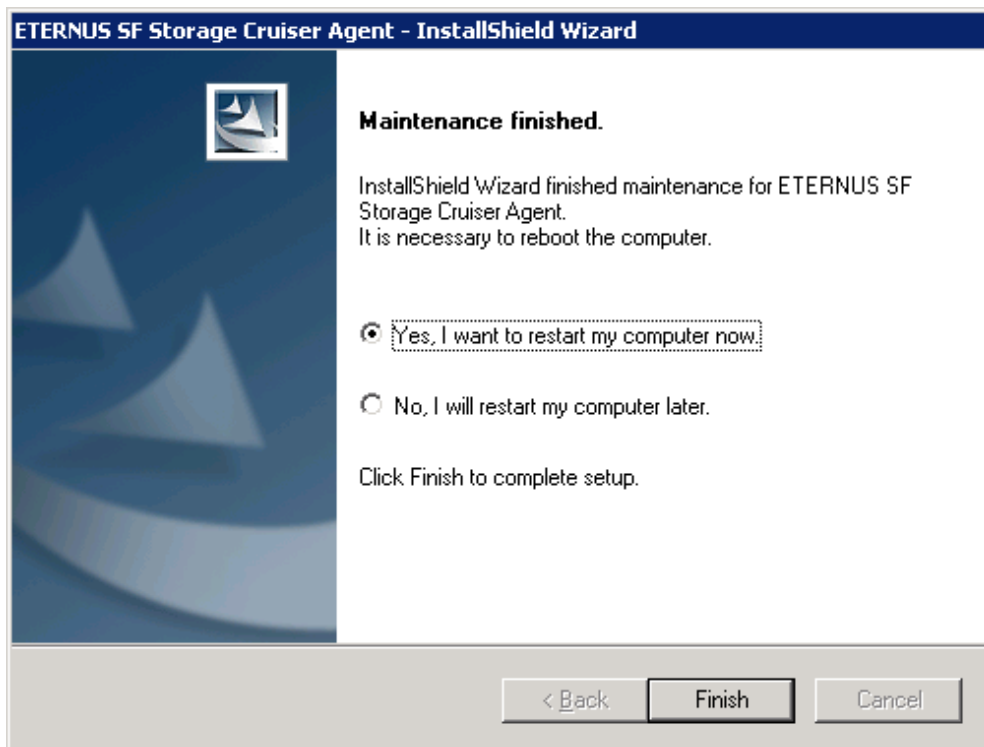
Sometimes, an error dialog may be displaying "Error reading setup initialization file", indicating that uninstallation cannot be performed. In such a case, insert the DVD-ROM that you used for installation into the DVD-ROM drive, open the directory stated below with Explorer or another application, and execute setup.exe.

- *<DVD-ROM drive>*:\Agent_windows\Storage_Cruiser\windows_x86

3. The following screen is displayed. Click the [OK] button.



4. When the uninstallation processing is complete and the following screen is displayed, click the [Finish] button.



5. Restart the system.

The uninstallation of Storage Cruiser's agent (for Windows) is completed.

Information

Sometimes, uninstallation does not delete the directory into which the software was installed.

[For example]

C:\ETERNUS_SF\ESC\Agent

In such a case, use Explorer or another application to delete the directory manually.

10.1.3 Uninstallation procedure of Storage Cruiser's agent (for Solaris)

The uninstallation procedure of Storage Cruiser's agent (for Solaris) is performed as follows:

1. Log in as "root (super user)" on the server on which to uninstall Storage Cruiser's agent.
2. Execute the following command:

```
# pkgrm FJSVssage
```

Note

If you are planning to install Storage Cruiser's agent again in a different directory after executing the pkgrm command, make sure that no FJSVssage package directories remain. For information on the FJSVssage package directory, refer to "[2.3.3.1 Required disk space for installation](#)".

If the FJSVssage package directory contains any user-specific files, the uninstallation process cannot delete these files; due to this, executing the pkgrm command will also not delete the FJSVssage package directory. In such a case, delete the directory manually.

3. Delete the sscruisera line from the /etc/services file.
4. Reboot the system.

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

The uninstallation of Storage Cruiser's agent (for Solaris) is completed.

10.1.4 Uninstallation procedure of Storage Cruiser's agent (for Linux)

The uninstallation procedure of Storage Cruiser's agent (for Linux) is performed as follows:

1. Log in as "root (super user)" on the server on which to uninstall Storage Cruiser's agent.
2. Execute the following command:

```
# rpm -e FJSVssage
```

Note

If you are planning to install Storage Cruiser's agent again in a different directory after executing the rpm command, make sure that no FJSVssage package directories remain. For information on the FJSVssage package directory, refer to "[2.3.3.1 Required disk space for installation](#)".

If the FJSVssage package directory contains any user-specific files, the uninstallation process cannot delete these files; due to this, executing the rpm command will also not delete the FJSVssage package directory. In such a case, delete the directory manually.

3. Delete the sscruisera line from the /etc/services file.
4. Reboot the system.

```
# /sbin/shutdown -r now
```

The uninstallation of Storage Cruiser's agent (for Linux) is completed.

10.1.5 Uninstallation procedure of Storage Cruiser's agent (for HP-UX)

The uninstallation procedure of Storage Cruiser's agent (for HP-UX) is performed as follows:

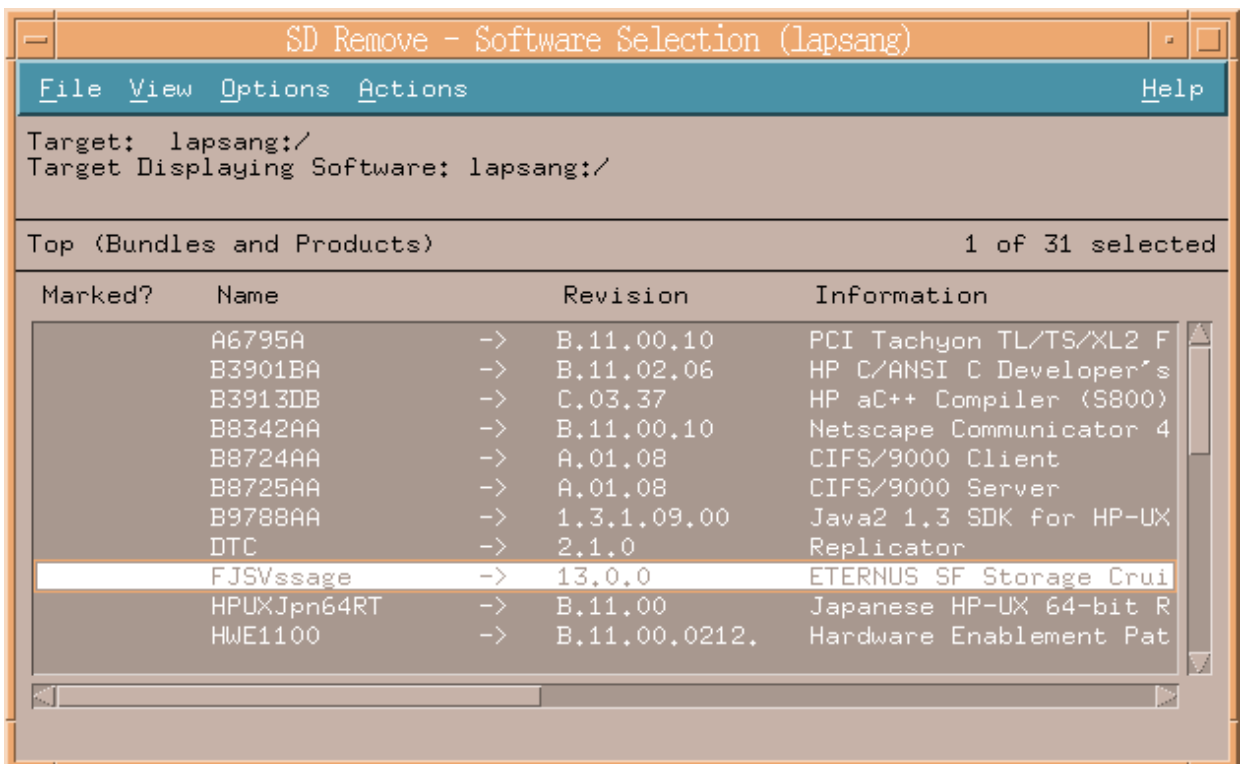
1. Log in as "root (super user)" on the server on which to uninstall Storage Cruiser's agent.
2. Move to the root directory (/).

```
# cd /
```

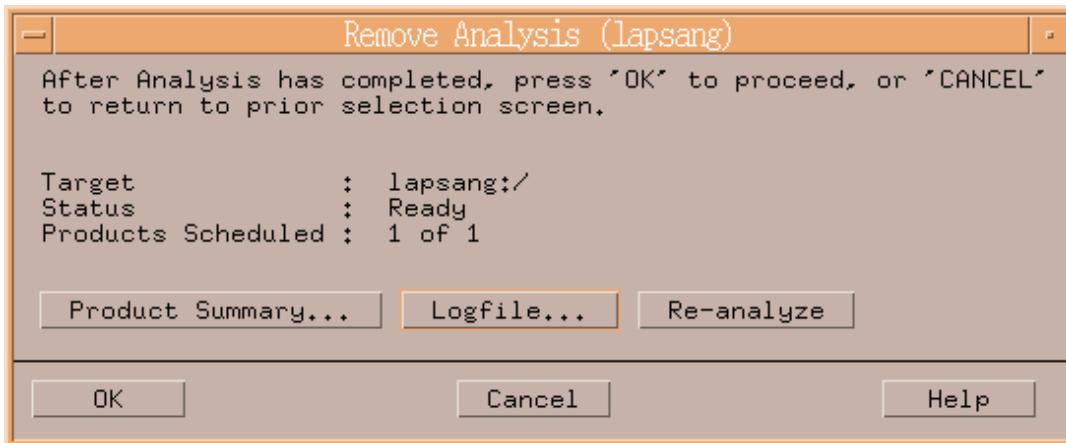
3. Execute the following command:

```
# swremove
```

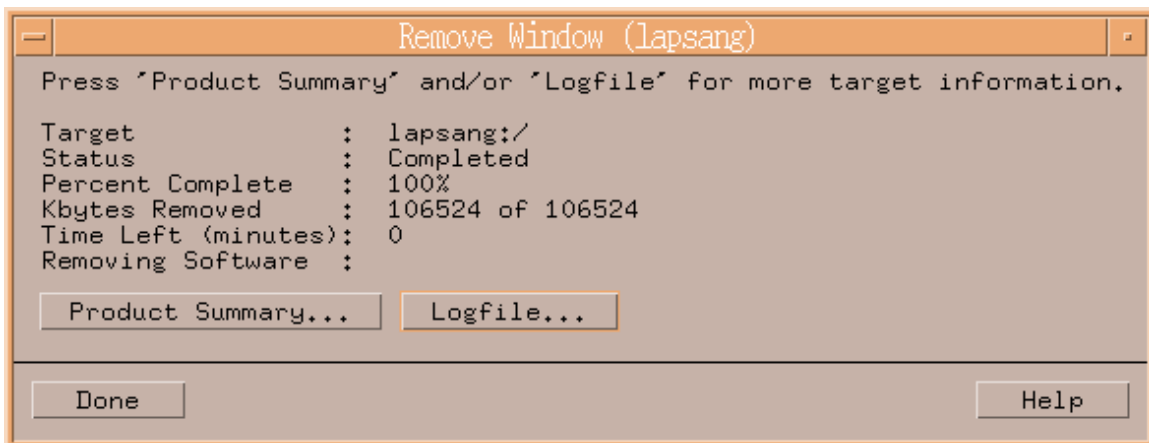
4. The following screen will be displayed. Select "FJSVssage" from the list, and click [Actions]-[Remove].



- The [Remove Analysis] screen is displayed, and package will be checked. After checking package is completed, click the [OK] button.



- The [Remove Window] screen is displayed. When "Completed" is displayed in the [Status] field, the uninstallation is completed. Clicking the [Done] button to go back to the initial screen.



- Delete the sscrusera line from the /etc/services file.
- The uninstallation of Storage Cruiser's agent (for HP-UX) is completed.

10.1.6 Uninstallation procedure of Storage Cruiser's agent (for VMware)

The uninstallation procedure of Storage Cruiser's agent (for VMware) is performed as follow:

- Log in as "root (super user)" on the server (Service Console of VMware ESX Server) on which to uninstall the Storage Cruiser's agent.
- Execute the following command:

```
# rpm -e FJSVssage
```

Note

If you are planning to install Storage Cruiser's agent again in a different directory after executing the rpm command, make sure that no FJSVssage package directories remain. For information on the FJSVssage package directory, refer to ["2.3.3.1 Required disk space for installation"](#).

If the FJSVssage package directory contains any user-specific files, the uninstallation process cannot delete these files; due to this, executing the rpm command will also not delete the FJSVssage package directory. In such a case, delete the directory manually.

3. Delete the sscrusera line from the /etc/services file.
4. Reboot the system.

```
# /sbin/shutdown -r now
```

The uninstallation of Storage Cruiser's agent (for VMware) is completed.

10.2 Uninstallation of AdvancedCopy Manager's agent

This section explains how to uninstall AdvancedCopy Manager's agent.

10.2.1 Before uninstallation

The following preparation work must be done before starting the uninstallation of AdvancedCopy Manager's agent.

10.2.1.1 Backup of backup management list

If you are planning to use the backup management list afterwards, back up the backup management list using swstresback command before starting the uninstallation of AdvancedCopy Manager's agent.

For details on the command, refer to "swstresback (Resource backup command)" in the "ETERNUS SF AdvancedCopy Manager Operation Guide" for the operating system of the Managed Server (Storage Server).

10.2.1.2 Deletion of clustered operating environment

Before starting the uninstallation of AdvancedCopy Manager's agent from server nodes on which a cluster environment is built, delete the environment of all Managed Server transactions (Storage Server transactions) created on these server nodes.

For detailed instructions, refer to "Deletion of Cluster Environment for Managed Server Transactions" in the "ETERNUS SF Cluster Environment Setup Guide".

10.2.1.3 Deletion of backup operation settings for Exchange Server (Windows environment only)

Before starting the uninstallation of AdvancedCopy Manager's agent from environments in which backup operation was implemented for Exchange Server databases, perform the tasks described under "Uninstallation" in "Backup and Restore of Exchange Server Databases" in the "ETERNUS SF AdvancedCopy Manager Operation Guide".

10.2.1.4 Deletion of Managed Server

The server from which the AdvancedCopy Manager's agent is uninstalled must be removed from the control of Management Server (Storage Management Server).

There are two methods for this task:

- Using the Web Console

- Executing the stgxfwcmdelrv command on the Management Server

For details on the command, refer to "stgxfwcmdelrv (Server information deletion command)" in the "ETERNUS SF AdvancedCopy Manager Operation Guide" for the operating system of the Management Server.

10.2.1.5 Backup of pre-processing and post-processing scripts

If AdvancedCopy Manager's agent is uninstalled, AdvancedCopy Manager's pre-processing and post-processing scripts (shell scripts) used in backup/restore and replication will also be deleted.

If there is a possibility that any customized scripts are used again, back up these scripts.

10.2.1.6 Stopping services/daemons

Perform the tasks described below to stop the services/daemons of the AdvancedCopy Manager's agent to be uninstalled.

For Windows environment

1. Select [Control Panel] -> [Administrative Tools] -> [Services] to display the Services screen.
2. Click the service which you want to stop, and click the [Stop] button.

For Solaris, Linux, HP-UX or AIX environments

Execute the following command to stop AdvancedCopy Manager daemon.

```
# /opt/swstorage/bin/stopacm
```

10.2.1.7 Deletion of the port number

From the services file, delete the port numbers that were used by services/daemons of AdvancedCopy Manager's agent. Usually, the services file is on the following path:

OS type	Path name
Windows	C:\WINDOWS\system32\drivers\etc\services
Solaris Linux HP-UX AIX	/etc/services

10.2.2 Uninstallation procedure of AdvancedCopy Manager's agent (for Windows)

The uninstallation procedure of AdvancedCopy Manager's agent (for Windows) is performed as follows:

1. Using an account with Administrator privileges, log on the server where the uninstallation will be performed.
2. Perform the following tasks.
 - For Windows Server 2003

From the Control Panel, open the [Add or Remove Programs] screen.

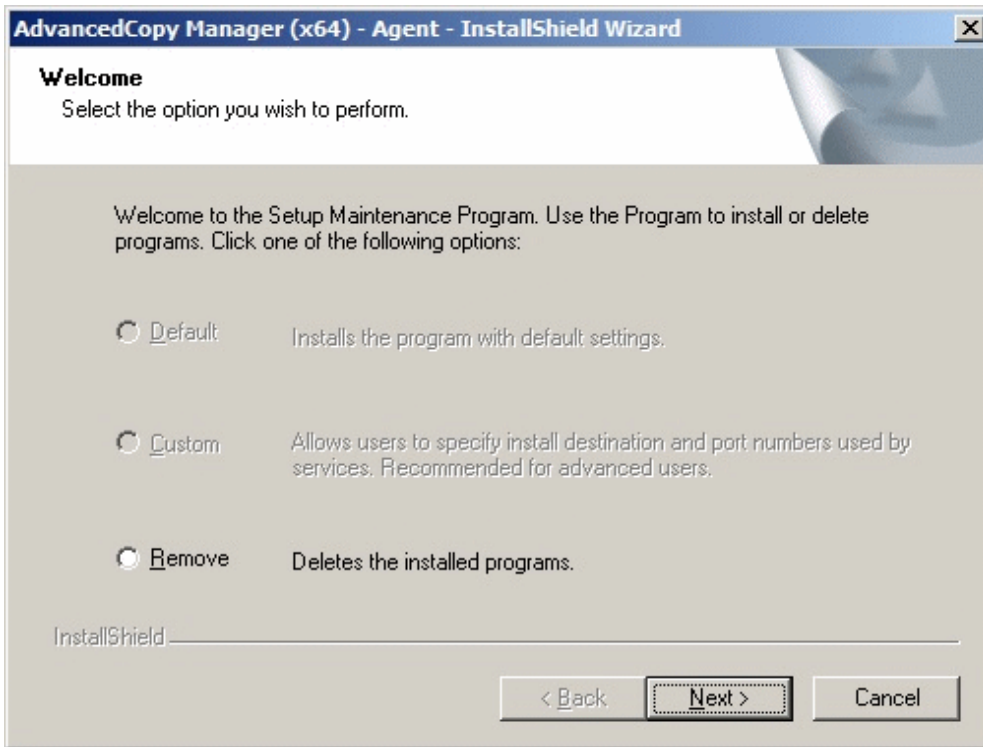
From the list of displayed programs, select "AdvancedCopy Manager - Agent" and then click the [Change/Remove] button.

- For Windows Server 2008 or Windows Server 2008 R2

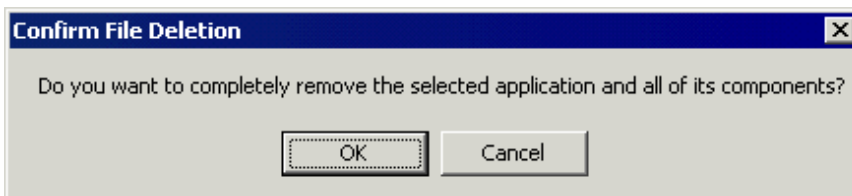
From the Control Panel, open the [Programs and Features] screen.

From the list of displayed programs, select "AdvancedCopy Manager - Agent" and then click the [Uninstall] button.

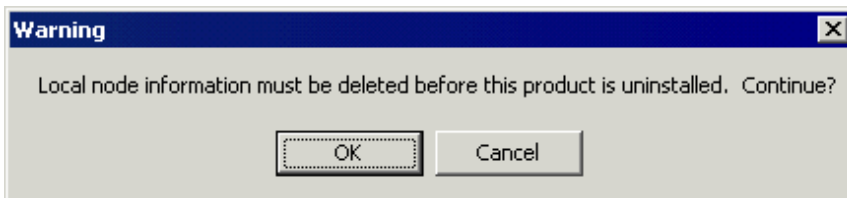
3. Select [Remove] on the [Welcome] screen, and then click the [Next] button.



4. The following screen is displayed. Click the [OK] button.

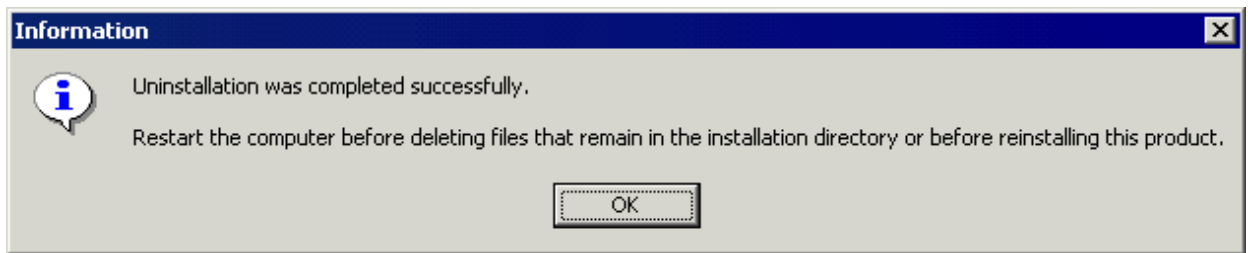


5. A screen is displayed to confirm whether you have completed the tasks described under "[10.2.1.4 Deletion of Managed Server](#)". If you have completed them, click the [OK] button.



If you have not completed them, click the [Cancel] button to terminate the uninstallation processing, and then perform the "[10.2.1.4 Deletion of Managed Server](#)". After that, restart this procedure from step 1.

6. When the uninstallation processing is completed, the following screen is displayed. Click the [OK] button.



7. Restart the system.

8. Delete the agent management information.

Use Explorer or another application to delete all files under *<Environment directory>*\etc after backing up any files as necessary.

The uninstallation of AdvancedCopy Manager's agent (for Windows) is completed.

10.2.3 Uninstallation procedure of AdvancedCopy Manager's agent (for Solaris)

The uninstallation procedure of AdvancedCopy Manager's agent (for Solaris) is performed as follows:

1. Log in as "root (super user)" on the server on which to uninstall AdvancedCopy Manager's agent.
2. Execute the following command:

By executing below command, most of the packages described in "[A.2.2 Program components of AdvancedCopy Manager's agent](#)" will be deleted.

```
# /opt/swstorage/setup/stg/swunsetup
```

3. Reboot the system.

The uninstallation of AdvancedCopy Manager's agent (for Solaris) is completed.

Information

- If you are planning to install AdvancedCopy Manager's agent again in a different directory after executing the swunsetup command, make sure that no package directories described in "[A.2.2 Program components of AdvancedCopy Manager's agent](#)" remain.
- In some cases, executing the swunsetup command will not delete the package directories described in "[A.2.2 Program components of AdvancedCopy Manager's agent](#)". If these are unnecessary, delete them manually.

10.2.4 Uninstallation procedure of AdvancedCopy Manager's agent (for Linux)

The uninstallation procedure of AdvancedCopy Manager's agent (for Linux) is performed as follows:

1. Log in as "root (super user)" on the server on which to uninstall AdvancedCopy Manager's agent.
2. Execute the following command:

By executing below command, most of the packages described in "[A.2.2 Program components of AdvancedCopy Manager's agent](#)" will be deleted.

```
# /opt/swstorage/setup/stg/swunsetup
```

3. Reboot the system.

The uninstallation of AdvancedCopy Manager's agent (for Linux) is completed.

Information

- If you are planning to install AdvancedCopy Manager's agent again in a different directory after executing the swunsetup command, make sure that no package directories described in "[A.2.2 Program components of AdvancedCopy Manager's agent](#)" remain.
- In some cases, executing the swunsetup command will not delete the package directories described in "[A.2.2 Program components of AdvancedCopy Manager's agent](#)". If these are unnecessary, delete them manually.

10.2.5 Uninstallation procedure of AdvancedCopy Manager's agent (for HP-UX)

The uninstallation procedure of AdvancedCopy Manager's agent (for HP-UX) is performed as follows:

1. Log in as "root (super user)" on the server on which to uninstall AdvancedCopy Manager's agent.
2. Execute the following command:

By executing below command, most of the packages described in "[A.2.2 Program components of AdvancedCopy Manager's agent](#)" will be deleted.

```
# /opt/swstorage/setup/stg/swunsetup
```

3. Reboot the system.

The uninstallation of AdvancedCopy Manager's agent (for HP-UX) is completed.

Information

- If you are planning to install AdvancedCopy Manager's agent again in a different directory after executing the swunsetup command, make sure that no package directories described in "[A.2.2 Program components of AdvancedCopy Manager's agent](#)" remain.
- In some cases, executing the swunsetup command will not delete the package directories described in "[A.2.2 Program components of AdvancedCopy Manager's agent](#)". If these are unnecessary, delete them manually.

10.2.6 Uninstallation procedure of AdvancedCopy Manager's agent (for AIX)

The uninstallation procedure of AdvancedCopy Manager's agent (for AIX) is performed as follows:

1. Log in as "root (super user)" on the server on which to uninstall AdvancedCopy Manager's agent.
2. Execute the following command:

By executing below command, most of the packages described in "[A.2.2 Program components of AdvancedCopy Manager's agent](#)" will be deleted.

```
# /opt/swstorage/setup/stg/swunsetup
```

3. If the following line is defined in the /etc/rc.shutdown file, delete this line.

```
/opt/FJSVswstf/daemon/stop_smgr0
```

4. Reboot the system.

The uninstallation of AdvancedCopy Manager's agent (for AIX) is completed.



Information

- If you are planning to install AdvancedCopy Manager's agent again in a different directory after executing the swunsetup command, make sure that no package directories described in "[A.2.2 Program components of AdvancedCopy Manager's agent](#)" remain.
- In some cases, executing the swunsetup command will not delete the package directories described in "[A.2.2 Program components of AdvancedCopy Manager's agent](#)". If these are unnecessary, delete them manually.

Chapter 11 Uninstallation of AdvancedCopy Manager CCM

This chapter explains how to uninstall AdvancedCopy Manager CCM.

Point

.....
This chapter describes the tasks that are necessary only if you have installed the AdvancedCopy Manager CCM as a standalone product. If you were using the AdvancedCopy Manager CCM that is included in ETERNUS SF Manager, do not perform the tasks described in this chapter.
.....

11.1 Before uninstallation

The following preparation work must be done before starting the uninstallation of AdvancedCopy Manager CCM.

11.1.1 Backup of the environment setting files

If there is a possibility that the current environment will be used again, e.g. after migration, back up (save) the AdvancedCopy Manager CCM environment as needed.

For detail how to backup, refer to "Backing up environment settings files" in the "ETERNUS SF Operation Guide for Copy Control Module".

11.1.2 Stopping of copy sessions

Stop all Advanced Copy sessions that are currently in progress in ETERNUS Disk storage system under the control of AdvancedCopy Manager CCM.

For the methods for checking and stopping active sessions of Advanced Copy, refer to "Managing copy sessions" in the "ETERNUS SF Operation Guide for Copy Control Module".

11.1.3 Eject the media

Make sure that "ETERNUS SF SC/ACM/Express V15.0 Mediapack" is not in a DVD-ROM.

When the media is in the DVD-ROM, eject it from the DVD-ROM drive.

Note

.....
An unexpected error may occur, when the media is left in the DVD-ROM drive.
.....

11.2 Uninstallation procedure of AdvancedCopy Manager CCM (for Windows)

The uninstallation procedure of AdvancedCopy Manager CCM is performed as follows:

1. Using an account with Administrator privileges, log in the server where the uninstallation will be performed.

2. Perform the following tasks:

- For Windows Server 2003

From the Control Panel, open the [Add or Remove Programs] screen.

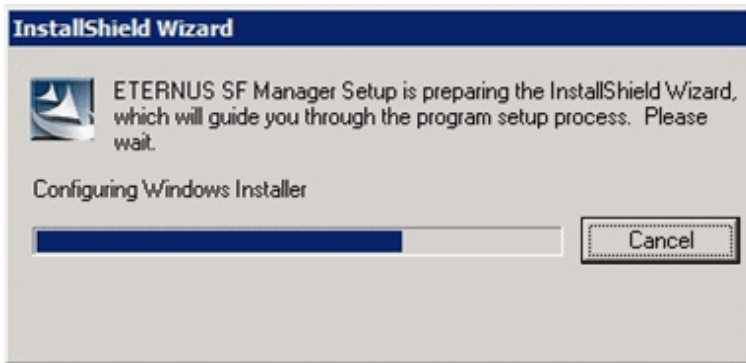
From the list of displayed programs, select "ETERNUS SF AdvancedCopy Manager Copy Control Module" and then click the [Change/Remove] button.

- For Windows Server 2008 or Windows Server 2008 R2

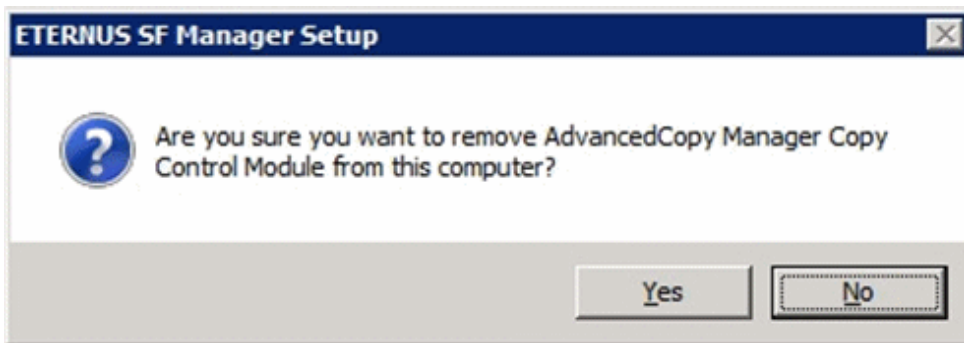
From the Control Panel, open the [Programs and Features] screen.

From the list of displayed programs, select "ETERNUS SF AdvancedCopy Manager Copy Control Module" and then click the [Uninstall] button.

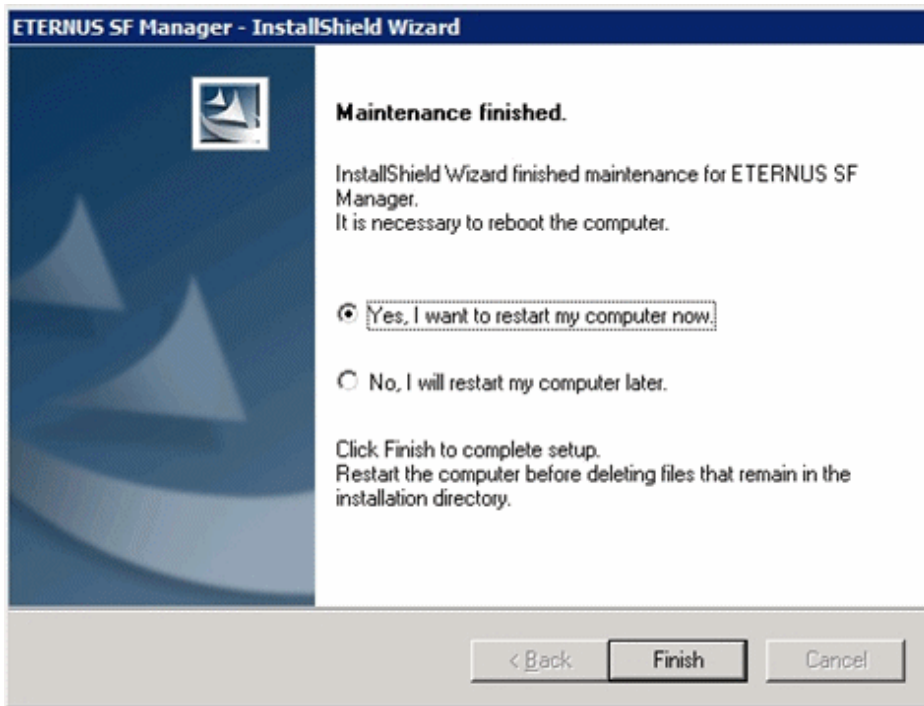
3. The following screen is displayed. To cancel the uninstallation at this stage, click the [Cancel] button.



4. The following verification screen is displayed. Click the [Yes] button.



5. The uninstallation processing starts. When it is complete and the following screen is displayed, click the [Finish] button.



Sometimes, uninstallation does not delete the directory into which the software was installed. In such a case, use Explorer or another application to delete the directory manually. By default, the installation directory is "C:\ETERNUS_SF".

6. Restart the system.

The uninstallation of AdvancedCopy Manager CCM (for Windows) is completed.

11.3 Uninstallation procedure of AdvancedCopy Manager CCM (for Solaris)

Use the following procedure to uninstall AdvancedCopy Manager CCM for Solaris.

1. Uninstall work of AdvancedCopy Manager CCM must be carried out as a super user. If a general user, use the su command to switch to super user.

```
$ su
```

2. Uninstall ETERNUS SF AdvancedCopy Manager CCM using the following command:

```
# /opt/FJSVesfcm/esinstaller/esfuninstall.sh
```

3. The following screen is displayed. To continue uninstallation, enter "y". To stop the uninstallation, enter "q".

```
+-----+
|                                     |
|               ETERNUS SF V15.0      |
|                                     |
| All Rights Reserved, Copyright (C) FUJITSU LIMITED 2012 |
|                                     |
+-----+
The following product has been installed on this system:
    ETERNUS SF AdvancedCopy Manager CCM
```

```
Do you want to continue the uninstallation? [y,q]:
```

4. The relevant packages are deleted, and execution result is displayed.

The following message is displayed at the end.

```
INFO: ETERNUS SF was uninstalled successfully.
```

5. Reboot the system.

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

The uninstallation of AdvancedCopy Manager CCM (for Solaris) is completed.

11.4 Uninstallation procedure of AdvancedCopy Manager CCM (for Linux)

Use the following procedure to uninstall AdvancedCopy Manager CCM for Linux.

1. Uninstall work of AdvancedCopy Manager CCM must be carried out as a super user. If a general user, use the su command to switch to super user.

```
$ su
```

2. Uninstall ETERNUS SF AdvancedCopy Manager CCM using the following command:

```
# /opt/FJVSvesfcm/esinstaller/esfuninstall.sh
```

3. The following screen is displayed. To continue uninstallation, enter "y". To stop the uninstallation, enter "q".

```
+-----+
|                                     |
|               ETERNUS SF V15.0     |
|                                     |
| All Rights Reserved, Copyright (C) FUJITSU LIMITED 2012 |
+-----+
The following product has been installed on this system:
      ETERNUS SF AdvancedCopy Manager CCM

Do you want to continue the uninstallation? [y,q]:
```

4. The relevant packages are deleted, and execution result is displayed.

The following message is displayed at the end.

```
INFO: ETERNUS SF was uninstalled successfully.
```

5. Reboot the system.

```
# /sbin/shutdown -r now
```

The uninstallation of AdvancedCopy Manager CCM (for Linux) is completed.

Chapter 12 Adding and Changing Products in Use

This chapter explains how to add and change products in use.

For upgrading from a previous product version, refer to the "ETERNUS SF Migration Guide".

The required procedures for the addition and change of products in use are as follows:

Addition and change of using products when ETERNUS SF Manager is installed

When ETERNUS SF Manager is installed, you can add and change the using products without uninstalling ETERNUS SF Manager.

The procedure for addition and change of products in use is as below.

Table 12.1 For adding and changing products in use when ETERNUS SF Manager is installed

Products in use	Products after addition and change					
	Express	Storage Cruiser	AdvancedCopy Manager	AdvancedCopy Manager CCM	Storage Cruiser and AdvancedCopy Manager	Storage Cruiser and AdvancedCopy Manager CCM
Express	-	- Register the Storage Cruiser license	- Register the AdvancedCopy Manager license	- Register the AdvancedCopy Manager license	- Register the Storage Cruiser and AdvancedCopy Manager licenses	
Storage Cruiser	-	-	1. Delete the Storage Cruiser license 2. Register the AdvancedCopy Manager license	- Register the AdvancedCopy Manager license	- Register the AdvancedCopy Manager license	
AdvancedCopy Manager	-	1. Delete the AdvancedCopy Manager license 2. Register the Storage Cruiser license	-	Can be used without any modifications	- Register the Storage Cruiser license	
AdvancedCopy Manager CCM			Can be used without any modifications	-		
Storage Cruiser and AdvancedCopy Manager	-	-	-	-	-	Can be used without any modifications
Storage Cruiser and AdvancedCopy Manager CCM	-	-	-	-	Can be used without any modifications	-

- : The products in use cannot be added and changed.

Addition and change of products when ETERNUS SF Manager CCM is installed as a standalone program

When AdvancedCopy Manager CCM is installed as a standalone program, AdvancedCopy Manager CCM uninstallation and ETERNUS SF Manager installation are required for the addition and change of products in use.

The required procedures for the addition and change of products in use are as follows.

1. Delete the AdvancedCopy Manager license.
2. Uninstall AdvancedCopy Manager CCM.
3. Install ETERNUS SF Manager.
4. Set up ETERNUS SF Manager as a manager for the product in use.

 **Point**

- When two products are used in one Management Server, ETERNUS SF Manager must be set up as a manager for each product.
- Register the license during setting up.

5. When a product in use is Storage Cruiser or AdvancedCopy Manager, install and set up the agent for each product if needed.

 **See**

For each procedure, refer to the following table.

Procedure	Reference place
Registration of license	B.3.1 Registration of license
Removal of license	B.3.3 Removal of license
Installation of ETERNUS SF Manager	Chapter 3 Installation of ETERNUS SF Manager
Setup of ETERNUS SF Manager	Chapter 4 Setup of ETERNUS SF Manager
Installation of Storage Cruiser's agent	5.1 Installation of Storage Cruiser's agent
Setup of Storage Cruiser's agent	6.1 Setup of Storage Cruiser's agent
Installation of AdvancedCopy Manager's agent	5.2 Installation of AdvancedCopy Manager's agent
Setup of AdvancedCopy Manager's agent	6.2 Setup of AdvancedCopy Manager's agent
Uninstallation of AdvancedCopy Manager CCM	Chapter 11 Uninstallation of AdvancedCopy Manager CCM

Appendix A Program components

This appendix explains the program components with Express, Storage Cruiser, and AdvancedCopy Manager.

A.1 Program components of ETERNUS SF Manager

This section explains the program components of ETERNUS SF Manager.

Program components of ETERNUS SF Manager for Windows

ETERNUS SF Manager for Windows is composed of the following package.

Table A.1 Program components of ETERNUS SF Manager for Windows

No.	Program name	Version	Function
1	ETERNUS SF Manager	15.0	Management of storage systems

Program components of ETERNUS SF Manager for Solaris

ETERNUS SF Manager for Solaris is composed of the following package.

Table A.2 Program components of ETERNUS SF Manager for Solaris

No.	Program name	Version	Function
1	FJSVssmgr	14.2.0	ETERNUS SF Manager Virtual storage management
2	FJSVssmgx	13.1.0	ETERNUS SF Manager (extension)
3	FJSVswstt	4.1	SNMP trap daemon
4	FJSVssmge	14.2.0	ETERNUS SF Manager (maintenance)
5	FJSVssetl	1.6.0	ETERNUS management library
6	FJSVgrapi	2.20	ETERNUS Disk storage systems Access API
7	FJSVswsrp	15.0	Replication Management
8	FJSVswssc	15.0	Security Framework
9	FJSVswstc	15.0	AdvancedCopy Manager API Library
10	FJSVswstf	15.0	AdvancedCopy Manager Basic
11	FJSVswsts	15.0	Backup Management
12	FJSVswtrc	13.4	Common Trace
13	FJSVrdbap	V28L10	Symfoware/RDB Client Package
14	FJSVrdbdb	V28L10	Symfoware/RDB Server Package
15	FJSVsymee	8.0	SymfoWARE Server Enterprise Edition Common Package
16	FSUNiconv	1.2.2	iconv standard code converter
17	FJSVsymjd	V20L81	Symfoware JDBC Driver package
18	FSUNrdb2b	V28L10	Symfoware/RDB Common Package
19	FSUNrdbps	V28L10	Symfoware/RDB Parallel Query Option
20	FJSVsymwa	V12L11	Symfoware WebAdmin
21	FJSVsymme	8.0.0	Symfoware Server Enterprise Edition Manual Package

No.	Program name	Version	Function
22	FJSVsymwd	V15L11	Symfoware WebDBtools
23	FJSVapccm	V38L10	Symfoware/RDB Connection Manager Common Package
24	FJSVapcdb	V38L10	Symfoware/RDB Connection Manager Server Package

Program components of ETERNUS SF Manager for Linux

ETERNUS SF Manager for Linux is composed of the following package.

Table A.3 Program components of ETERNUS SF Manager for Linux (For Red Hat Enterprise Linux 5 (for x86))

No.	Program name	Version	Function
1	FJSVssmgr	14.2.0	ETERNUS SF Manager Virtual storage management
2	FJSVssmgx	13.1.0	ETERNUS SF Manager (extension)
3	FJSVssmge	14.2.0	ETERNUS SF Manager (maintenance)
4	FJSVssetl	1.6.0	ETERNUS management library
5	FJSVgrapi	1.16-1	ETERNUS Disk storage systems Access API
6	FJSVswsrp	15.0-01	Replication Management
7	FJSVswssc	15.0-01	Security Framework
8	FJSVswstc	15.0-01	AdvancedCopy Manager API Library
9	FJSVswstf	15.0-01	AdvancedCopy Manager Basic
10	FJSVswsts	15.0-01	Backup Management
11	FJSVswtrc	13.1-01	Common Trace
12	FJSVrdb2b	2910.50-1	Symfoware/RDB Common Package
13	FJSVrdbap	2910.50-1	Symfoware/RDB Client Package
14	FJSVrdbdb	2910.50-1	Symfoware/RDB Server Package
15	FJSVsymee	9010.50-1	Symfoware Server Enterprise Edition Common Package
16	FJSVsymjd	9010.50-1	Symfoware JDBC Driver Package
17	FJSVrdbps	2910.50-1	Symfoware/RDB Parallel Query Package
18	FJSVsymwd	1610.50-1	Symfoware WebDBtools
19	FJSVsymwa	1310.50-1	Symfoware WebAdmin
20	FJSVsymme	9010.50-1	Symfoware Server Enterprise Edition Manual Package
21	FJSVapccm	2910.50-1	Symfoware Server Connection Manager Common Package
22	FJSVapcdb	2910.50-1	Symfoware Server Connection Manager Database Package

Table A.4 Program components of ETERNUS SF Manager for Linux (For Red Hat Enterprise Linux 5 (for Intel64))

No.	Program name	Version	Function
1	FJSVssmgr	14.2.0	ETERNUS SF Manager Virtual storage management
2	FJSVssmgx	13.1.0	ETERNUS SF Manager (extension)

No.	Program name	Version	Function
3	FJSVssmge	14.2.0	ETERNUS SF Manager (maintenance)
4	FJSVssetl	1.6.0	ETERNUS management library
5	FJSVgrapi	1.16-1	ETERNUS Disk storage systems Access API
6	FJSVswsrp	15.0-01	Replication Management
7	FJSVswssc	15.0-01	Security Framework
8	FJSVswstc	15.0-01	AdvancedCopy Manager API Library
9	FJSVswstf	15.0-01	AdvancedCopy Manager Basic
10	FJSVswsts	15.0-01	Backup Management
11	FJSVswtrc	14.2-01	Common Trace
12	FJSVrdb2b	3920.50-1	Symfoware/RDB Common Package
13	FJSVrdbap	3920.50-1	Symfoware/RDB Client Package
14	FJSVrdbdb	3920.50-1	Symfoware/RDB Server Package
15	FJSVsymee	9020.50-1	Symfoware Server Enterprise Edition Common Package
16	FJSVsymjd	9020.50-2	Symfoware JDBC Driver Package
17	FJSVrdbps	3920.50-1	Symfoware/RDB Parallel Query Package
18	FJSVsymwd	1620.50-1	Symfoware WebDBtools
19	FJSVsymwa	1320.50-1	Symfoware WebAdmin
20	FJSVsymme	9020.50-1	Symfoware Server Enterprise Edition Manual Package
21	FJSVapccm	2920.50-1	Symfoware Server Connection Manager Common Package
22	FJSVapcdb	2920.50-1	Symfoware Server Connection Manager Database Package

Table A.5 Program components of ETERNUS SF Manager for Linux (For RHEL6)

No.	Program name	Version	Function
1	FJSVssmgr	14.2.0	ETERNUS SF Manager Virtual storage management
2	FJSVssmgx	13.1.0	ETERNUS SF Manager (extension)
3	FJSVssmge	14.2.0	ETERNUS SF Manager (maintenance)
4	FJSVssetl	1.6.0	ETERNUS management library
5	FJSVgrapi	1.16-1	ETERNUS Disk storage systems Access API
6	FJSVswsrp	15.0-01	Replication Management
7	FJSVswssc	15.0-01	Security Framework
8	FJSVswstc	15.0-01	AdvancedCopy Manager API Library
9	FJSVswstf	15.0-01	AdvancedCopy Manager Basic
10	FJSVswsts	15.0-01	Backup Management
11	FJSVswtrc	15.0-01	Common Trace
12	FJSVrdb2b	VA100.6-3	Symfoware/RDB Common Package
13	FJSVrdbap	VA100.6-3	Symfoware/RDB Client Package
14	FJSVrdbdb	VA100.6-1	Symfoware/RDB Server Package

No.	Program name	Version	Function
15	FJSVsymee	VA100.6-1	Symfoware Server Enterprise Edition Common Package
16	FJSVsymjd	VA100.6-3	Symfoware JDBC Driver Package
17	FJSVrdbps	VA100.6-1	Symfoware/RDB Parallel Query Package
18	FJSVsymwd	VA000.6-2	Symfoware WebDBtools
19	FJSVsymwa	VA010.6-2	Symfoware WebAdmin
20	FJSVsymme	VA103.6-1	Symfoware Server Enterprise Edition Manual Package
21	FJSVapccm	VA100.6-3	Symfoware Server Connection Manager Common Package
22	FJSVapcdb	VA100.6-1	Symfoware Server Connection Manager Database Package

A.2 Program components of ETERNUS SF Agent

This section explains the program components of ETERNUS SF Agent.

A.2.1 Program components of Storage Cruiser's agent

Storage Cruiser's agent is composed of the following packages:

Program components of Storage Cruiser's agent for Windows

Storage Cruiser's agent for Windows is composed of the following package:

Table A.6 Program components of Storage Cruiser's agent for Windows

No.	Program name	Version	Function
1	ETERNUS SF Storage Cruiser Agent	15.0	Storage Cruiser's agent

Program components of Storage Cruiser's agent for Solaris

Storage Cruiser's agent for Solaris is composed of the following package:

Table A.7 Program components of Storage Cruiser's agent for Solaris

No.	Package name	Version	Function
1	FJSVssage	14.2.0	Storage Cruiser's agent

Program components of Storage Cruiser's agent for Linux

Storage Cruiser's agent for Linux is composed of the following package:

Table A.8 Program components of Storage Cruiser's agent for Linux

No.	Package name	Version	Function
1	FJSVssage	14.2.0	Storage Cruiser's agent

Program components of Storage Cruiser's agent for HP-UX

Storage Cruiser's agent for HP-UX is composed of the following packages:

Table A.9 Program components of Storage Cruiser's agent for HP-UX

No.	Package name	Version	Function
1	FJSVssage	13.0.0	Storage Cruiser's agent (for HP-UX 11 and 11i v1)
2	FJSVssage	13.4.0	Storage Cruiser's agent (for HP-UX 11i v2 and 11i v3)

Program components of Storage Cruiser's agent for VMware

Storage Cruiser's agent for VMware is composed of the following package:

Table A.10 Program components of Storage Cruiser's agent for VMware

No.	Package name	Version	Function
1	FJSVssage	14.2.0	Storage Cruiser's agent

A.2.2 Program components of AdvancedCopy Manager's agent

AdvancedCopy Manager's agent is composed of the following packages:

Program components of AdvancedCopy Manager's agent for Windows

AdvancedCopy Manager's agent for Windows is composed of the following package:

Table A.11 Program components of AdvancedCopy Manager's agent for Windows

No.	Program name	Version	Function
1	ETERNUS SF AdvancedCopy Manager Agent	15.0	AdvancedCopy Manager's agent

Program components of AdvancedCopy Manager's agent for Solaris

AdvancedCopy Manager's agent for Solaris is composed of the following packages:

Table A.12 Program components of AdvancedCopy Manager's agent for Solaris

No.	Package name	Version	Function
1	FJSVgrapi	2.20	ETERNUS disk storage systems Access API
2	FJSVswsrp	15.0	Replication Management
3	FJSVswstc	15.0	AdvancedCopy Manager API Library
4	FJSVswstf	15.0	AdvancedCopy Manager Basic
5	FJSVswsts	15.0	Backup Management
6	FJSVswtrc	13.4	Common Trace

Program components of AdvancedCopy Manager's agent for Linux

AdvancedCopy Manager's agent for Solaris is composed of the following packages:

The necessary package varies depending on the version of the system environment where the AdvancedCopy Manager's agent for Linux is installed.

For RHEL-AS4, RHEL-ES4, and RHEL5

The package configuration is represented as follows based on the system environment where the agent is installed:

- Red Hat Enterprise Linux AS (v.4 for x86)
- Red Hat Enterprise Linux ES (v.4 for x86)
- Red Hat Enterprise Linux AS (v.4 for EM64T)
- Red Hat Enterprise Linux ES (v.4 for EM64T)
- Red Hat Enterprise Linux 5 (for x86)
- Red Hat Enterprise Linux 5 (for Intel64)

Table A.13 Program components of AdvancedCopy Manager's agent for Linux (For RHEL-AS4, RHEL-ES4, and RHEL5)

No.	Package name	Version	Function
1	FJSVgrapi	1.16-1	ETERNUS disk storage systems Access API
2	FJSVswsrp	15.0-01	Replication Management
3	FJSVswstc	- For v.4 : 13.3-01 - For 5: 15.0-01	AdvancedCopy Manager API Library
4	FJSVswstf	15.0-01	AdvancedCopy Manager Basic
5	FJSVswsts	15.0-01	Backup Management
6	FJSVswtrc	- For v.4: 13.0-01 - For 5 (for x86): 13.1-01 - For 5 (for Intel64): 14.2-01	Common Trace

For RHEL6

The package configuration is represented as follows based on the system environment where the agent is installed:

- Red Hat Enterprise Linux 6 (for x86)
- Red Hat Enterprise Linux 6 (for Intel64)

Table A.14 Program components of AdvancedCopy Manager's agent for Linux (For RHEL6)

No.	Package name	Version	Function
1	FJSVgrapi	1.16-1	ETERNUS disk storage systems Access API
2	FJSVswsrp	15.0-01	Replication Management
3	FJSVswstc	15.0-01	AdvancedCopy Manager API Library
4	FJSVswstf	15.0-01	AdvancedCopy Manager Basic
5	FJSVswsts	15.0-01	Backup Management
6	FJSVswtrc	15.0-01	Common Trace

For SUSE Linux Enterprise Server 11

The package configuration is represented as follows based on the system environment where the agent is installed:

- SUSE Linux Enterprise Server 11 (for x86)
- SUSE Linux Enterprise Server 11 (for EM64T)

Table A.15 Program components of AdvancedCopy Manager's agent for Linux (For SUSE Linux Enterprise Server)

No.	Package name	Version	Function
1	FJSVgrapi	1.16-1	ETERNUS disk storage systems Access API
2	FJSVswsrp	15.0-01	Replication Management
3	FJSVswstc	15.0-01	AdvancedCopy Manager API Library
4	FJSVswstf	15.0-01	AdvancedCopy Manager Basic
5	FJSVswsts	15.0-01	Backup Management
6	FJSVswtrc	15.0-01	Common Trace

Program components of AdvancedCopy Manager's agent for HP-UX

AdvancedCopy Manager's agent for HP-UX is composed of the following packages:

Table A.16 Program components of AdvancedCopy Manager's agent for HP-UX

No.	Package name	Version	Function
1	FJSVgrapi	2.18	ETERNUS disk storage systems Access API
2	FJSVswsrp	15.0	Replication Management
3	FJSVswstc	13.4	AdvancedCopy Manager API Library
4	FJSVswstf	15.0	AdvancedCopy Manager Basic
5	FJSVswsts	15.0	Backup Management
6	FJSVswtrc	13.1	Common Trace

Program components of AdvancedCopy Manager's agent for AIX

AdvancedCopy Manager's agent for AIX is composed of the following packages:

Table A.17 Program components of AdvancedCopy Manager's agent for AIX

No.	Package name	Version	Function
1	FJSVgrapi	2.18	ETERNUS disk storage systems Access API
2	FJSVswsrp	15.0	Replication Management
3	FJSVswstc	13.3	AdvancedCopy Manager API Library
4	FJSVswstf	15.0	AdvancedCopy Manager Basic
5	FJSVswsts	15.0	Backup Management
6	FJSVswtrc	13.1	Common Trace

A.3 Program components of AdvancedCopy Manager CCM

AdvancedCopy Manager CCM is composed of the following packages:

Program components of AdvancedCopy Manager CCM for Solaris

AdvancedCopy Manager CCM for Solaris is composed of the following package:

Table A.18 Program components of AdvancedCopy Manager CCM for Solaris

No.	Package name	Version	Function
1	FJSVccm	15.0	ETERNUS SF AdvancedCopy Manager Copy Control Module

Program components of AdvancedCopy Manager CCM for Linux

AdvancedCopy Manager CCM for Linux is composed of the following package:

Table A.19 Program components of AdvancedCopy Manager CCM for Linux

No.	Package name	Version	Function
1	FJSVccm	15.0-1	ETERNUS SF AdvancedCopy Manager Copy Control Module

Appendix B License Management

In order to enable the functions of Express, Storage Cruiser, and AdvancedCopy Manager, it is required to register the corresponding license keys in ETERNUS SF Manager.

This appendix explains the license management function.

B.1 Types of license

On the current version level of the product, the following types of license that can be managed by the license management function:

Table B.1 Types of license

No. (NOTE)	License name	Explanation
L1	ETERNUS SF Local Copy License	License for using Advanced Copy functions of ETERNUS DX60/DX60 S2/DX80/DX80 S2/DX90/DX90 S2. Advanced Copy can be done inside the storage system only.
L2	ETERNUS SF Remote Copy License	License for using the remote Advanced Copy functions.
L3	ETERNUS SF Storage Cruiser Basic License	License for managing ETERNUS Disk storage systems.
L4	ETERNUS SF Storage Cruiser Standard License	License for totally managing the SAN environment including ETERNUS Disk storage systems, switches and servers. This license is also necessary for managing NetApp FAS Series and V-Series.
L5	ETERNUS SF Storage Cruiser Standard CM Expansion (2->4CM)	License for managing ETERNUS DX8700/DX8700 S2, ETERNUS8000 models 2100 and 2200. This license is required for a disk storage system which has more than 2 CMs.
L6	ETERNUS SF Storage Cruiser Standard CM Expansion (4->6CM)	License for managing ETERNUS DX8700/DX8700 S2, ETERNUS8000 models 2100 and 2200. This license is required for a disk storage system which has more than 4 CMs.
L7	ETERNUS SF Storage Cruiser Standard CM Expansion (6->8CM)	License for managing ETERNUS DX8700/DX8700 S2, ETERNUS8000 models 2100 and 2200. This license is required for a disk storage system which has more than 6 CMs.
L8	ETERNUS SF Storage Cruiser Optimization Option	License for managing Automated Storage Tiering feature for ETERNUS DX80 S2/DX90 S2, ETERNUS DX400 S2 series, ETERNUS DX8000 S2 series.
L9	ETERNUS SF AdvancedCopy Manager Local Copy License	License for using Advanced Copy functions of ETERNUS Disk storage system in the following ways: Advanced Copy can be done inside the storage system only. <ul style="list-style-type: none"> - Agent-based operation model: An agent is installed on a Managed Server and the operation is done in cooperation with the Managed Server's OS or DBMS. - Agent-less operation model: Advanced Copy is done by using AdvancedCopy Manager Copy Control Module, without installing an agent on the Managed Server.

No. (NOTE)	License name	Explanation
		<p>This license applies to ETERNUS DX60/DX60 S2/DX80/DX80 S2/DX90/DX90 S2 and ETERNUS DX400 S2 series.</p> <p>Advanced Copy Feature license for the ETERNUS Disk storage system is not required.</p>
L10	ETERNUS SF AdvancedCopy Manager Local Copy License (w/o HW license)	<p>License for using Advanced Copy functions of ETERNUS Disk storage system in the following ways: Advanced Copy can be done inside the storage system only.</p> <ul style="list-style-type: none"> - Agent-based operation model: An agent is installed on a Managed Server and the operation is done in cooperation with the Managed Server's OS or DBMS. - Agent-less operation model: Advanced Copy is done by using AdvancedCopy Manager Copy Control Module, without installing an agent on the Managed Server. <p>This license applies to ETERNUS Disk storage system except ETERNUS DX60/DX60 S2/DX80/DX80 S2/DX90/DX90 S2 and ETERNUS DX400 S2 series.</p> <p>The prior registration of the Advanced Copy Feature license for the ETERNUS Disk storage system is required.</p>
L11	ETERNUS SF AdvancedCopy Manager Local Copy CM Expansion (2->4CM)	<p>License for using Advanced Copy functions of ETERNUS DX8700/DX8700 S2, ETERNUS8000 models 2100 and 2200.</p> <p>This license is required for a disk storage system which has more than 2 CMs.</p>
L12	ETERNUS SF AdvancedCopy Manager Local Copy CM Expansion (4->6CM)	<p>License for using Advanced Copy functions of ETERNUS DX8700/DX8700 S2, ETERNUS8000 models 2100 and 2200.</p> <p>This license is required for a disk storage system which has more than 4 CMs.</p>
L13	ETERNUS SF AdvancedCopy Manager Local Copy CM Expansion (6->8CM)	<p>License for using Advanced Copy functions of ETERNUS DX8700/DX8700 S2, ETERNUS8000 models 2100 and 2200.</p> <p>This license is required for a disk storage system which has more than 6 CMs.</p>
L14	ETERNUS SF AdvancedCopy Manager Remote Copy License	<p>License for using Remote Advanced Copy functions of ETERNUS Disk storage system in the following ways: Advanced Copy can be done between ETERNUS Disk storage systems.</p> <ul style="list-style-type: none"> - Agent-based operation model: An agent is installed on a Managed Server and the operation is done in cooperation with the Managed Server's OS or DBMS. - Agent-less operation model: Advanced Copy is done by using AdvancedCopy Manager Copy Control Module, without installing an agent on the Managed Server. <p>This license applies to ETERNUS DX90/DX90 S2 and ETERNUS DX400 S2 series.</p> <p>Advanced Copy Feature license for the ETERNUS Disk storage system is not required.</p>

No. (NOTE)	License name	Explanation
L15	ETERNUS SF AdvancedCopy Manager Remote Copy License (w/o HW license)	<p>License for using Remote Advanced Copy functions of ETERNUS Disk storage system in the following ways: Advanced Copy can be done between ETERNUS Disk storage systems.</p> <ul style="list-style-type: none"> - Agent-based operation model: An agent is installed on a Managed Server and the operation is done in cooperation with the Managed Server's OS or DBMS. - Agent-less operation model: Advanced Copy is done by using AdvancedCopy Manager Copy Control Module, without installing an agent on the Managed Server. <p>The license applies to ETERNUS Disk storage system except ETERNUS DX90/DX90 S2 and ETERNUS DX400 S2 series.</p> <p>The prior registration of the Advanced Copy Feature license for the ETERNUS Disk storage system is required.</p>
L16	ETERNUS SF AdvancedCopy Manager Remote Copy CM Expansion (2->4CM)	<p>License for using Remote Advanced Copy functions of ETERNUS DX8700/DX8700 S2, ETERNUS8000 models 2100 and 2200.</p> <p>This license is required for a disk storage system which has more than 2 CMs.</p>
L17	ETERNUS SF AdvancedCopy Manager Remote Copy CM Expansion (4->6CM)	<p>License for using Remote Advanced Copy functions of ETERNUS DX8700/DX8700 S2, ETERNUS8000 models 2100 and 2200.</p> <p>This license is required for a disk storage system which has more than 4 CMs.</p>
L18	ETERNUS SF AdvancedCopy Manager Remote Copy CM Expansion (6->8CM)	<p>License for using Remote Advanced Copy functions of ETERNUS DX8700/DX8700 S2, ETERNUS8000 models 2100 and 2200.</p> <p>This license is required for a disk storage system which has more than 6 CMs.</p>
L19	ETERNUS SF Storage Cruiser V15 Standard License Software Upgrade	<p>License for totally managing the SAN environment including ETERNUS Disk storage systems, switches and servers.</p> <p>This license is an additional license on which L3 license is already registered.</p>
L20	ETERNUS SF AdvancedCopy Manager V15 Local Copy License Software Upgrade	<p>License for using Advanced Copy functions of ETERNUS Disk storage system in the following ways: Advanced Copy can be done inside the storage system only.</p> <ul style="list-style-type: none"> - Agent-based operation model: An agent is installed on a Managed Server and the operation is done in cooperation with the Managed Server's OS or DBMS. - Agent-less operation model: Advanced Copy is done by using AdvancedCopy Manager Copy Control Module, without installing an agent on the Managed Server. <p>This license applies to ETERNUS DX60/DX60 S2/DX80/DX80 S2/DX90/DX90 S2 and ETERNUS DX410 S2/DX440 S2, and is an additional license on which L1 license or Advanced Copy Feature license is already registered.</p> <p>For ETERNUS DX410 S2/DX440 S2, Advanced Copy Feature license must be registered prior to this license registration.</p>

No. (NOTE)	License name	Explanation
L21	ETERNUS SF AdvancedCopy Manager V15 Remote Copy License Software Upgrade	<p>License for using Remote Advanced Copy functions of ETERNUS Disk storage system in the following ways: Advanced Copy can be done between ETERNUS Disk storage systems.</p> <ul style="list-style-type: none"> - Agent-based operation model: An agent is installed on a Managed Server and the operation is done in cooperation with the Managed Server's OS or DBMS. - Agent-less operation model: Advanced Copy is done by using AdvancedCopy Manager Copy Control Module, without installing an agent on the Managed Server. <p>This license applies to ETERNUS DX90/DX90 S2 and is an additional license on which L2 license is already registered.</p>

NOTE: The text string for the item numbers (Lxx) solely serves for explanation purposes. This is not the actual license key or license number.

B.2 Functions provided by licenses

On the current version level of the product, the range of functions that become available varies with each license. The functions provided by each license are shown in the following table.

Table B.2 Available major functions per license

Function		License (A=Available)						
		Express (Free of charge)	Express Local Copy License	Express Remote Copy License	Storage Cruiser Basic	Storage Cruiser Standard	Advanced Copy Manager Local Copy License	Advanced Copy Manager Remote Copy License
Display of ETERNUS Disk storage system status	Normal/abnormal status	A	-	-	A	A	A	A
	Detailed status of disk storage system configuration	A	-	-	A	A	-	-
	Eco-mode status	A	-	-	A	A	-	-
Other device status		-	-	-	-	Server and switch	-	-
Server, volumes connection management	ETERNUS Disk storage system, switch and server	-	-	-	-	A	-	-
Volume creation and allocation	ETERNUS Disk storage system	A	-	-	A	A	-	-
I/O path configuration	ETERNUS Disk storage system and switch	-	-	-	-	A	-	-
Eco Mode setting	ETERNUS Disk storage system	A	-	-	A	A	-	-

Function		License (A=Available)						
		Express (Free of charge)	Express Local Copy License	Express Remote Copy License	Storage Cruiser Basic	Storage Cruiser Standard	Advanced Copy Manager Local Copy License	Advanced Copy Manager Remote Copy License
Performance data collection	ETERNUS Disk storage system	24 hours Max	-	-	User defined interval	User defined interval	-	-
	Switch	-	-	-	-	User defined interval	-	-
Performance monitoring	ETERNUS Disk storage system	-	-	-	A	A	-	-
Storage system temperature graph display	ETERNUS Disk storage system	24 hours Max	-	-	User defined interval	User defined interval	-	-
Advanced Copy	SnapOPC+	8 sessions Max	A	-	-	-	A	-
	OPC/QuickOPC	-	A	-	-	-	A	-
	EC	-	A	-	-	-	A	-
	REC	-	-	A	-	-	-	A
	Advanced Copy settings	A	A	A	A	A	A	A
	Remote copy path settings	-	-	A	-	-	-	A
	Backup management	-	-	-	-	-	A	-
	DBMS/OS support (NOTE)	-	-	-	-	-	A	A

NOTE: Interoperability with external applications such as Exchange Server and SQL Server, including file systems and pre/post processing scripts.

B.3 Operation of license management function

This section explains the various ways to operate the license management function.

The license management function can be operated using either the Web Console or the CLI (Command Line Interface). The table below shows the types and methods of operation for handling licenses.

Type of operation	Method (A=Available, N/A=Not Available)	
	CLI	Web Console
License registration	A	A
Display of license information	A	A
License removal	A	A

Type of operation	Method (A=Available, N/A=Not Available)	
	CLI	Web Console
Backup and restore of database for license management	A	N/A

Point

The command is available in all the operating system environments in which ETERNUS SF Manager or AdvancedCopy Manager Copy Control Module operates.

For details on the commands, refer to "[B.4 Command reference](#)".

Note

- License registration and removal from the Web Console can be operated only by users who belong to the ESFAdmin role group.
- The license registration command can be executed only by users with administrator privileges.
The meaning of "User with administrative privileges" varies according to the OS as indicated below.
 - In Linux environment or Solaris environment, the term referring to "User with administrative privileges" is root (Super user).
 - In Windows environment, the term referring to the user of belonging to Administrators group.
- Before you register licenses from the Web Console, carry out device registration for the ETERNUS Disk storage system. For the procedure for registering devices of the disk storage system, refer to "[4.2.4 Registering disk storage system](#)".
If you want to register licenses in a disk storage system for which device registration has not been performed, use the CLI.
- The following ETERNUS Disk storage systems can specify the IP address on the command.
ETERNUS DX60/DX60 S2/DX80/DX80 S2/DX90/DX90 S2, ETERNUS DX400 S2 series, ETERNUS DX8000 S2 series
Enable the following connections in setting up interface on the ETERNUS Disk storage system.
 - For specifying the IP address of ETERNUS DX60/DX60 S2/DX80/DX90
Enable the telnet connection.
 - For specifying the IP address of ETERNUS DX80 S2/DX90 S2, ETERNUS DX400 S2 series, ETERNUS DX8000 S2 series
Enable the ssh connection or telnet connection.

B.3.1 Registration of license

This subsection explains how to register licenses in a disk storage system.

Using the Web Console

For details about the procedure, refer to "Registration of license" in the "ETERNUS SF Web Console Guide".

Using the line command

The following procedure is required to register a license:

1. Confirm the license ID of the license to register with the esflm listid command.

```
> esflm listid
```

2. Execute the following command:

- If the server on which the command is executed can access the target ETERNUS Disk storage system:

```
> esflm add License-ID License-Key -i IP-Address -u User-Name -p Password
```

- If the server on which the command is executed cannot access the target ETERNUS Disk storage system:

```
> esflm add License-ID License-Key -s Serial-Number
```

B.3.2 Displaying of the license

This subsection explains how to display the registered licenses.

Using the Web Console

For details about the procedure, refer to "Displaying the license" in the "ETERNUS SF Web Console Guide".

Using the line command

For displaying the information of registered licenses, execute the esflm list command.

- For displaying the information of all registered licenses:

Execute the esflm list command without any operands.

```
> esflm list
```

- For displaying the information for each product:

Execute the esflm list command by specifying the product name.

```
> esflm list Product-Name
```

- For displaying the information for each ETERNUS Disk storage system:

Execute the esflm list command by specifying the serial number of the target ETERNUS Disk storage system.

```
> esflm list Serial-Number
```

B.3.3 Removal of license

This subsection explains how to remove registered licenses.

Using the Web Console

For details about the procedure, refer to "Removal of license" in the "ETERNUS SF Web Console Guide".

Using the line command

For removing the registered licenses, execute the esflm remove command.

- For removing a particular license:

Execute the esflm remove command by specifying the serial number of the target ETERNUS Disk storage system and the ID of the license to be removed.

```
> esflm remove Serial-Number License-ID
```

- For removing all licenses from a particular ETERNUS Disk storage system:

Execute the esflm remove command by specifying the serial number of the target ETERNUS Disk storage system and the -all option

```
> esflm remove Serial-Number -all
```

B.3.4 Backup and restore the license management database

The license information that is registered in the license management function is stored in a database called "license management database". The following procedure is required to back up and restore the license management database.

- For backup:

Execute the esflm backup command by specifying the name of the file in which to back up the license management database.

```
> esflm backup Backup-File-Name
```

- For restoration:

Execute the esflm restore command by specifying the name of the file in which the license management database is backed up.

```
> esflm restore Backup-File-Name
```

B.4 Command reference

This section describes the usage of the license management function command.

The commands of license management function are as follows:

Command name	Description
esflm	Performs various functions for license management.

The commands of license management function are stored in the following directory.

OS type	Location
Windows	<Installation directory of ETERNUS SF Manager or AdvancedCopy Manager Copy Control Module>\LM\bin
Solaris Linux	/opt/FJSVesflm/bin



Note

The command can be executed only by users with administrator privileges.

The meaning of "User with administrative privileges" varies according to the OS as indicated below.

- In Linux environment or Solaris environment, the term referring to "User with administrative privileges" is root (Super user).
 - In Windows environment, the term referring to the user of belonging to Administrators group.
-

B.4.1 esflm add (License registration command)

NAME

esflm add - Registers a license information to the license management function

SYNOPSIS

```
esflm add License-ID [License-Key {-s Serial-Number | -i IP-Address -u User-Name [-p Password ]}] | -i IP-Address -u User-Name [-p Password]
```

DESCRIPTION

This command registers the license information to the license management function.

OPTIONS

-s *Serial-Number*

This option is used to specify the serial number of the target ETERNUS Disk storage system, if a license for remote copy is registered and the server on which the command is executed cannot access the target ETERNUS Disk storage system.

-i *IP-Address*

This option is used to specify an IP address of the target ETERNUS Disk storage system.

-u *User-Name*

This option is used to specify a user name to access the target ETERNUS Disk storage system.

-p *Password*

This option is used to specify the password of the user specified by the -u option.

When this option is omitted, it is necessary to enter the password from the console.

OPERANDS

License-ID

This operand is used to specify a license ID.

License-Key

This operand is used to specify a license key.

If the license is already set in the ETERNUS Disk storage system, it is possible to specify the -i option instead of this operand.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> esflm add 01000002 A3CD487CB52F7C03 -i 192.168.10.11 -u user1 -p psw99999
A license was registered successfully
```

B.4.2 esflm backup (License management database backup command)

NAME

esflm backup - Performs a backup of the license management database

SYNOPSIS

```
esflm backup Backup-File
```

DESCRIPTION

This command performs a backup of the license management database.

OPERANDS

Backup-File

This operand is used to specify the name of the file in which to back up the data.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> esflm backup Backup.dat
Backup of license database was performed successfully
```

B.4.3 esflm list (License list command)

NAME

esflm list - Displays the list of license information registered into the license management function

SYNOPSIS

```
esflm list [Product-Name | Serial-Number] [-remaindays Days]
```

DESCRIPTION

This command displays the list of license information registered to license management function. The contents to be displayed are as follows:

Title	Description
Product	Product name Express : ETERNUS SF Express ACM : ETERNUS SF AdvancedCopy Manager SC: ETERNUS SF Storage Cruiser
License ID	License ID
License	License name
Serial Number	Serial number of ETERNUS Disk storage system
Registration Date	Date of license registration
Expire Date	Expired date for trial license (for the license which is not trial license, the blank is displayed in this field)

OPTIONS

-remaindays *Days*

This option is used to specify the number of remaining days for trial licenses.

For example, for displaying a list of information on trial licenses whose validity expires on the today and tomorrow, specify this option argument to "1".

OPERANDS

Product-Name

This operand is used to specify a product name if you would like to display the license information associated with a particular ETERNUS SF product. The strings that can be specified are as follows:

Strings that can be specified	Product name
Express	ETERNUS SF Express
ACM	ETERNUS SF AdvancedCopy Manager
SC	ETERNUS SF Storage Cruiser

Serial-Number

This operand is used to specify a serial number of the target ETERNUS Disk storage system if you would like to display the license information associated with a particular ETERNUS Disk storage system.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> esflm list Express
Product License ID License                               Serial Number Registration Date Expire Date
Express 020006000  ETERNUS SF Express 15 TierS ABCDEFGHIJKL  2011/07/15      2011/08/14
```

B.4.4 esflm listid (License ID list command)

NAME

esflm listid - Displays the list of license IDs that can be registered to license management function

SYNOPSIS

```
esflm listid [-s Serial-Number | -i IP-Address -u User-Name [-p Password]]
```

DESCRIPTION

This command displays the list of license IDs that can be registered to license management function. The contents to be displayed are as follows:

Title	Description
Product	Product name Express : ETERNUS SF Express ACM : ETERNUS SF AdvancedCopy Manager SC: ETERNUS SF Storage Cruiser
License ID	License ID
License Name	License name

OPTIONS

-s *Serial-Number*

This option is used to specify the serial number of the ETERNUS Disk storage system.

If licenses are already registered under the specified serial number, license information available for registration on the same model name will be displayed.

If no licenses are registered, all licenses that are available for registration will be displayed.

-i *IP-Address*

This option is used to specify the IP address of the ETERNUS Disk storage system.

If licenses are already registered under the serial number of the ETERNUS Disk storage system specified by the IP address, license information available for registration on the same model name will be displayed.

If no licenses are registered, the hardware licenses that are set in the ETERNUS Disk storage system will be surveyed, and then the licenses that are set will be displayed.

If no hardware licenses are registered either, all licenses that are available for registration will be displayed.

-u *User-Name*

This option is used to specify the user name for access to the ETERNUS Disk storage system.

-p *Password*

This option is used to specify the password of the user who is specified by the -u option.

This option is omitted, it is necessary to enter the password from the console.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

Display all the license IDs that can be registered to the license management function.

```

> esflm listid
Product License ID      License Name
Express 00000803L      ETERNUS SF Local Copy License V15 for DX80S2
Express 00000903L      ETERNUS SF Local Copy License V15 for DX90S2
:
ACM      04000603L      ETERNUS SF AdvancedCopy Manager V15 Local Copy License for DX60S2
ACM      04000606L      ETERNUS SF AdvancedCopy Manager V15 Local Copy License Software Upgrade for
DX60S2
:
SC      08020600B      ETERNUS SF Storage Cruiser V15 Basic License for DX60 (DX60S2)
:

```

B.4.5 esflm remove (License remove command)

NAME

esflm remove - Removes a registered license information from the license management function

SYNOPSIS

```
esflm remove Serial-Number {License-ID | -all}
```

DESCRIPTION

This command removes the registered license information from the license management function.

OPTIONS

-all

This option is used to remove all the registered licenses of the target ETERNUS Disk storage system.

OPERANDS

Serial-Number

This operand is used to specify a serial number of the target ETERNUS Disk storage system.

License-ID

This operand is used to specify a license ID if a particular license information is to be removed.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```

> esflm remove ABCDEFGHIJKL -all
All licenses were removed successfully

```

B.4.6 esflm restore (License management database restore command)

NAME

esflm restore - Performs a restoration of the license management database

SYNOPSIS

```
esflm restore Backup-File
```

DESCRIPTION

This command performs a restoration of the license management database.

OPERANDS

Backup-File

This operand is used to specify a backed up file.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> esflm restore Backup.dat
Restoration of license database was performed successfully
```

B.5 Maintenance of license management function

This section describes methods for changing the operating environment using the license management function and for troubleshooting.

B.5.1 Backup and restoration of license definition information

For methods for backing up and restoring license definition information, refer to "[B.3.4 Backup and restore the license management database](#)".

If a license key is not set, this operation is not required.

B.5.2 Collection of troubleshooting data for license management function

Log in on the server where the license management function is running and collect the information listed below:

After that, send the collected data to your Fujitsu system engineer.

OS type	File type	Collected files
Windows	Log files	All files under the <Installation directory of ETERNUS SF Manager or AdvancedCopy Manager Copy Control Module>\LM\var directory

OS type	File type	Collected files
	Definition files	All files under the <Installation directory of ETERNUS SF Manager or AdvancedCopy Manager Copy Control Module>\LM\ etc directory
Solaris	Log files	All files under the /var/opt/FJSVesflm directory
Linux	Definition files	All files under the /etc/opt/FJSVesflm directory

Appendix C Required Disk Space for Performance Management

This appendix explains the required disk space for the performance management with ETERNUS SF Manager.

When the performance management is being performed, based on the fibre channel switch used to collect the performance information, the type of ETERNUS disk storage system, the number of logical units involved, the number of DE (Disk Enclosure), and the number of days for which information is to be collected, the required capacity given below becomes necessary.

Information

The default number of days for collection is seven. The number of secured LUs (Logical Units) is the actual number of LUs the functions of which are secured in order to perform performance management for the ETERNUS disk storage systems. Performance management is secured in units of 64 LUN for the ETERNUS disk storage systems. Therefore, when instructed to secure from LUN 15 to 200, the information for the actual LUs 0 to 255 (256 in total) would be secured.

Target device	Required disk space (Unit : MB)
ETERNUS DX60/DX60 S2 ETERNUS DX80/DX80 S2 ETERNUS DX90/DX90 S2	$(Number_of_keeping_days + 1) * (240 + (1.2 + 0.3 * Number_of_DEs + 0.3 * (Number_of_secured_LUs + Number_of_secured_RAIDGroups [NOTE 1])) * (86400 / Performance_monitoring_interval(seconds)) + 3 * (10.6 + 0.07 * (86400 / Performance_monitoring_interval(seconds) [NOTE 2])) (95 * Number_of_DEs) + (50 * (Number_of_secured_LUs + Number_of_secured_RAIDGroups[NOTE 1]))) / 1024$ <p>NOTE 1 : The "Number_of_secured_RAIDGroups" is the number of RAIDGroups created from the secured LUs. NOTE 2 : The performance monitoring interval sets 60 seconds if its interval is set to less than 60 seconds.)</p>
ETERNUS DX400 series	$(Number_of_keeping_days + 1) * (6837 + (17 + 0.2 * Number_of_DEs + 0.2 * Number_of_secured_LUs + 0.3 * Number_of_secured_RAIDGroups [NOTE 1]) * (86400 / Performance_monitoring_interval(seconds)) + (10.6 + 0.07 * (86400 / Performance_monitoring_interval(seconds) [NOTE 2])) + (79 * Number_of_DEs) + (89 * Number_of_secured_LUs) + (103 * Number_of_secured_RAIDGroups [NOTE 1])) / 1024$ <p>NOTE 1 : The "Number_of_secured_RAIDGroups" is the number of RAIDGroups created from the secured LUs. NOTE 2 : The performance monitoring interval sets 60 seconds if its interval is set to less than 60 seconds.)</p>
ETERNUS DX400 S2 series ETERNUS DX8000 S2 series	$(Number_of_keeping_days + 1) * (6837 + (17 + 0.2 * Number_of_DEs + 0.2 * Number_of_secured_LUs + 0.3 * Number_of_secured_RAIDGroups [NOTE 1]) * (86400 / Performance_monitoring_interval(seconds)) + 3 * (10.6 + 0.07 * (86400 / Performance_monitoring_interval(seconds) [NOTE 2])) + (79 * Number_of_DEs) + (89 * Number_of_secured_LUs) + (103 * Number_of_secured_RAIDGroups [NOTE 1])) / 1024$ <p>NOTE 1 : The "Number_of_secured_RAIDGroups" is the number of RAIDGroups created from the secured LUs. NOTE 2 : The performance monitoring interval sets 60 seconds if its interval is set to less than 60 seconds.</p>
ETERNUS DX8100	Refer to the formula of ETERNUS DX400 series.

Target device	Required disk space (Unit : MB)
ETERNUS DX8400 ETERNUS DX8700	$(Number_of_keeping_days + 1) * (24090 + (60 + 0.2 * Number_of_DEs + 0.2 * Number_of_secured_LUs + 0.3 * Number_of_secured_RAIDGroups[NOTE])) * (86400 / Performance_monitoring_interval(seconds)) + (10.6 + 0.07 * (86400 / Performance_monitoring_interval(seconds) [Note 2])) + (79 * Number_of_DEs) + (89 * Number_of_secured_LUs) + (103 * Number_of_secured_RAIDGroups[NOTE])) / 1024$ <p>NOTE 1 : The "Number_of_secured_RAIDGroups" is the number of RAIDGroups created from the secured LUs.</p> <p>NOTE 2 : The performance monitoring interval sets 60 seconds if its interval is set to less than 60 seconds.</p>
ETERNUS2000	<p>The firmware version is older than V10L50:</p> $(Number_of_keeping_days + 1) * (140 + (0.7 + 0.2 * Number_of_DEs + 0.3 * (Number_of_secured_LUs + Number_of_secured_RAIDGroups[NOTE])) * (86400 / Performance_monitoring_interval(seconds)) + (60 * Number_of_DEs) + (50 * (Number_of_secured_LUs + Number_of_secured_RAIDGroups[NOTE]))) / 1024$ <p>NOTE: The "Number_of_secured_RAIDGroups" is the number of RAIDGroups created from the secured LUs.</p> <p>The firmware version is V10L50 or later:</p> $(Number_of_keeping_days + 1) * (140 + (0.7 + 0.2 * Number_of_DEs + 0.3 * (Number_of_secured_LUs + Number_of_secured_RAIDGroups [NOTE 1])) * (86400 / Performance_monitoring_interval(seconds)) + (10.6 + 0.07 * (86400 / Performance_monitoring_interval(seconds) [NOTE 2])) + (60 * Number_of_DEs) + (50 * (Number_of_secured_LUs + Number_of_secured_RAIDGroups [Note 1]))) / 1024$ <p>NOTE 1: The "Number_of_secured_RAIDGroups" is the number of RAIDGroups created from the secured LUs.</p> <p>NOTE 2: The performance monitoring interval sets 60 seconds if its interval is set to less than 60 seconds.</p>
ETERNUS4000 models 300 and 500	<p>The firmware version is older than V11L40:</p> $(Number_of_keeping_days + 1) * (5000 + (30 + 0.4 * Number_of_DEs + 0.3 * Number_of_secured_LUs) * (86400 / Performance_monitoring_interval(seconds)) + (120 * Number_of_DEs) + (50 * Number_of_secured_LUs)) / 1024$ <p>The firmware version is V11L40 or later, and older than V11L50:</p> $(Number_of_keeping_days + 1) * (5000 + (30 + 0.4 * Number_of_DEs + 0.3 * (Number_of_secured_LUs + Number_of_secured_RAIDGroups[NOTE])) * (86400 / Performance_monitoring_interval(seconds)) + (120 * Number_of_DEs) + (50 * (Number_of_secured_LUs + Number_of_secured_RAIDGroups[NOTE]))) / 1024$ <p>NOTE: The "Number_of_secured_RAIDGroups" is the number of RAIDGroups created from the secured LUs.</p> <p>The firmware version is V11L50 or later:</p> $(Number_of_keeping_days + 1) * (5000 + (30 + 0.4 * Number_of_DEs + 0.3 * (Number_of_secured_LUs + Number_of_secured_RAIDGroups [NOTE 1])) * (86400 / Performance_monitoring_interval(seconds)) + (10.6 + 0.07 * (86400 / Performance_monitoring_interval(seconds)$

Target device	Required disk space (Unit : MB)
	$[\text{NOTE 2}]) + (120 * \text{Number_of_DEs}) + (50 * (\text{Number_of_secured_LUs} + \text{Number_of_secured_RAIDGroups} [\text{NOTE 1}])) / 1024$ <p>NOTE 1: The "Number_of_secured_RAIDGroups" is the number of RAIDGroups created from the secured LUs.</p> <p>NOTE 2: The performance monitoring interval sets 60 seconds if its interval is set to less than 60 seconds.</p>
ETERNUS4000 models 400 and 600	Refer to the formula of ETERNUS DX400 series.
ETERNUS8000 models 700, 900, 1100 and 2100	<p>The firmware version is older than V11L40:</p> $(\text{Number_of_keeping_days} + 1) * (18000 + (90 + 0.4 * \text{Number_of_DEs} + 0.3 * \text{Number_of_secured_LUs}) * (86400 / \text{Performance_monitoring_interval(seconds)})) + (120 * \text{Number_of_DEs}) + (50 * \text{Number_of_secured_LUs}) / 1024$ <p>The firmware version is V11L40 or later, and older than V11L50:</p> $(\text{Number_of_keeping_days} + 1) * (18000 + (90 + 0.4 * \text{Number_of_DEs} + 0.3 * (\text{Number_of_secured_LUs} + \text{Number_of_secured_RAIDGroups} [\text{NOTE}])) * (86400 / \text{Performance_monitoring_interval(seconds)})) + (120 * \text{Number_of_DEs}) + (50 * (\text{Number_of_secured_LUs} + \text{Number_of_secured_RAIDGroups} [\text{NOTE}])) / 1024$ <p>NOTE: The "Number_of_secured_RAIDGroups" is the number of RAIDGroups created from the secured LUs.</p> <p>The firmware version is V11L50 or later:</p> $(\text{Number_of_keeping_days} + 1) * (18000 + (90 + 0.4 * \text{Number_of_DEs} + 0.3 * (\text{Number_of_secured_LUs} + \text{Number_of_secured_RAIDGroups} [\text{Note 1}])) * (86400 / \text{Performance_monitoring_interval(seconds)})) + (10.6 + 0.07 * (86400 / \text{Performance_monitoring_interval(seconds)}) [\text{Note 2}])) + (120 * \text{Number_of_DEs}) + (50 * (\text{Number_of_secured_LUs} + \text{Number_of_secured_RAIDGroups} [\text{Note 1}])) / 1024$ <p>NOTE 1 : The "Number_of_secured_RAIDGroups" is the number of RAIDGroups created from the secured LUs.</p> <p>NOTE 2 : The performance monitoring interval sets 60 seconds if its interval is set to less than 60 seconds.</p>
ETERNUS8000 model 800	Refer to the formula of ETERNUS DX400 series.
ETERNUS8000 models 1200 and 2200	Refer to the formula of ETERNUS DX8400/DX8700.
ETERNUS SN200 series Fibre Channel switch (Maximum number of FC ports = 16 or less) PRIMERGY Fibre Channel Switch Blade PRIMERGY Fibre Channel Switch Blade(4Gbps) Brocade Fibre Channel Switch (Maximum number of FC ports = 16 or less)	$(\text{Number_of_keeping_days} + 1) * (30 / \text{Performance_monitoring_interval(seconds)}) * 1.6$
ETERNUS SN200 series Fibre Channel switch (Maximum number of FC ports = 32 or less) Brocade Fibre Channel Switch (Maximum number of FC ports = 32 or less)	$(\text{Number_of_keeping_days} + 1) * (30 / \text{Performance_monitoring_interval(seconds)}) * 3.2$
ETERNUS SN200 series Fibre Channel switch (Maximum number of FC ports = 128 or less)	$(\text{Number_of_keeping_days} + 1) * (30 / \text{Performance_monitoring_interval(seconds)}) * 13$

Target device	Required disk space (Unit : MB)
Brocade Fibre Channel Switch (Maximum number of FC ports = 128 or less)	
ETERNUS SN200 series Fibre Channel switch (Maximum number of FC ports = 256 or less) Brocade Fibre Channel Switch (Maximum number of FC ports = 256 or less)	$(Number_of_keeping_days + 1) * (30 / Performance_monitoring_interval(seconds)) * 26$
ETERNUS SN200 series Fibre Channel switch (Maximum number of FC ports = 384 or less) Brocade Fibre Channel Switch (Maximum number of FC ports = 384 or less)	$(Number_of_keeping_days + 1) * (30 / Performance_monitoring_interval(seconds)) * 39$
ETERNUS SN200 MDS series Fibre Channel switch	$(Number_of_keeping_days + 1) * 0.1 * Maximum_number_of_slots_supported_by_device[NOTE] * 128 * (30 / Performance_monitoring_interval(seconds))$ NOTE: Use 1 as the maximum number of slots for MDS9120

Additionally, when performance information is output using the performance information operation command, the following disk space is required, depending on the number of LUs of ETERNUS Disk storage system and Fibre Channel switches, number of DEs, number of ports that is used to collect performance information, and number of days of performance information output. Each element (number of installed CM CPUs, number of installed DEs, installed CA Ports, installed CM Ports, LUs, RAIDGroups, and installed FC Ports) is the number mounted in the device when the command is executed.

Target device	Required disk space (Unit : MB)
ETERNUS DX60/DX60 S2 ETERNUS DX80/DX80 S2 ETERNUS DX90/DX90 S2	$Number_of_days_to_output * (((0.1 + 0.4 * Number_of_DEs + 0.1 * Number_of_CM_Ports + 0.2 * (Number_of_LUs + Number_of_RAIDGroups)) * (86400 / Performance_monitoring_interval(seconds))) + (0.2 + 0.6 * Number_of_DEs + 0.2 * Number_of_CM_Ports + 0.4 * (Number_of_LUs + Number_of_RAIDGroups))) / 1024$
ETERNUS DX400/DX400 S2 series ETERNUS DX8000 series	$Number_of_days_to_output * (((0.1 + 0.2 * Number_of_DEs + 0.1 * Number_of_CA_Ports + 0.2 * (Number_of_LUs + Number_of_RAIDGroups)) + 0.1 * Number_of_CM_CPUs) * (86400 / Performance_monitoring_interval(seconds))) + (0.9 + 0.8 * Number_of_DEs + 0.2 * Number_of_CA_Ports + 0.4 * (Number_of_LUs + Number_of_RAIDGroups)) + 0.1 * Number_of_CM_CPUs) / 1024$
ETERNUS2000	$Number_of_days_to_output * (((0.1 + 0.2 * Number_of_DEs + 0.1 * Number_of_CM_Ports + 0.2 * (Number_of_LUs + Number_of_RAIDGroups)) * (86400 / Performance_monitoring_interval(seconds))) + (0.2 + 0.3 * Number_of_DEs + 0.2 * Number_of_CM_Ports + 0.4 * (Number_of_LUs + Number_of_RAIDGroups))) / 1024$
ETERNUS4000 models 300 and 500	$Number_of_days_to_output * (((0.3 + 0.4 * Number_of_DEs + 0.1 * Number_of_CA_Ports + 0.2 * (Number_of_LUs + Number_of_RAIDGroups)) * (86400 / Performance_monitoring_interval(seconds))) + (0.9 + 0.8 * Number_of_DEs + 0.2 * Number_of_CA_Ports + 0.4 * (Number_of_LUs + Number_of_RAIDGroups))) / 1024$
ETERNUS4000 models 400 and 600	Refer to the formula of ETERNUS DX400/DX400 S2 series.
ETERNUS8000 models 700, 900, 1100 and 2100	Refer to the formula of ETERNUS4000 models 300 and 500.
ETERNUS8000 models 800, 1200 and 2200	Refer to the formula of ETERNUS DX400/DX400 S2 series.

Target device	Required disk space (Unit : MB)
Fibre Channel switches	$\frac{\text{Number_of_days_to_output} * (0.1 + \text{Number_of_FC_ports} + (0.1 * \text{Number_of_FC_ports})) + (0.1 + \text{Number_of_ports} + (0.1 * \text{Number_of_FC_ports}) * (86400 / \text{Performance_monitoring_interval(seconds)}))}{1024}$



See

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 For the command, refer to "Performance information operation command (storageadm perfdata)" in the "ETERNUS SF Storage Cruiser Operation Guide".
