Fujitsu Storage
ETERNUS SF
Express V16.9.1 / Storage Cruiser V16.9.1 / AdvancedCopy Manager V16.9.1

Quick Reference

Preface

Purpose of This Manual

This manual describes the pre-installation requirements, installation procedure, configuration procedure, as well as the first use of the following products:

- 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 planning installation or installing the above products for the first time. A basic knowledge of clustered systems and server virtualization is advised to fully understand this manual.

In the case of upgrade from a previous version to the latest version, refer to the *ETERNUS SF Express / Storage Cruiser / AdvancedCopy Manager Migration Guide*.

Structure of This Manual

The structure of this manual is as follows.

Part 1 Express

Conventions

- "FUJITSU Storage" and "Fujitsu Storage" are omitted from the names of the products and manuals.

- This manual abides by the conventions listed in "Conventions" in the *ETERNUS SF Express / Storage Cruiser / AdvancedCopy Manager Documentation Road Map*.

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- This manual is subject to change without advance notice.

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Update History

Content of Update	Updated Section	Revision
The "FUJITSU Storage" part of the product name has been changed to "Fujitsu Storage".	Cover page	12
Information related to the following device has been deleted. - ETERNUS DX200F	General	
The version information has been changed to V16.9A.	Cover page	11
Information related to the following device has been deleted. - NetApp V-Series	General	10
The product overview article has been deleted from this manual because it was moved to the *Overview*.		
Information related to the following devices has been added. - ETERNUS AX/HX series - ETERNUS AB/HB series In addition, the device name "NetApp AFF A series" has been changed to "NetApp AFF series".	6.3	9.3
The description has been corrected.	6.3, 9.1	9.2
The URL address of the *SNIA HBA API Library Installation Guide* has been modified.	9.1	9.1

Content of Update	Updated Section	Revision
Information related to the following devices has been added. - ETERNUS DX S5 series - ETERNUS AF S3 series Information related to the following devices has been deleted. - ETERNUS DX60, DX400 series, DX8000 series - ETERNUS SN200 series	General	9
The description for Conventions has been changed so that the *ETERNUS SF Express / Storage Cruiser / AdvancedCopy Manager Documentation Road Map* is referenced.	"Conventions" in Preface	
The "Manual Organization and Reading Suggestions" section has been deleted from Preface.	Preface	
Information related to Microsoft Windows Server 2019 has been added.	"Notation" in Preface	8.1
Information related to the ETERNUS LT140 has been added.	"Notation" in Preface	
Information related to the ETERNUS DX8900 S4 has been added.	"Notation" in Preface	8
Information related to Solaris 9 has been deleted.	"Notation" in Preface	7
Information related to the ETERNUS DX500 S4/DX600 S4 has been added.	"Notation" in Preface	
Information related to the ETERNUS AF250 S2/AF650 S2 has been added.	"Notation" in Preface, 1.3, 1.4, 4.2, 5.1.2, 6.3, 11.3.1, 12.3.3	
Information related to Microsoft Windows Server 2016 has been added.	"Notation" in Preface	6
Information related to Windows Vista has been deleted.	"Notation" in Preface	
Information related to SUSE Linux Enterprise Server 11 has been deleted and information related to SUSE Linux Enterprise Server 12 for AMD64 & Intel64 has been added.	"Notation" in Preface	
Information related to the ETERNUS DX60 S4/DX100 S4/DX200 S4 has been added.	"Notation" in Preface, 1.3, 1.4, 4.2, 5.1.2, 12.3.3	
Information related to HP-UX 11i v1/v2 has been deleted.	"Notation" in Preface	5
Information related to VMware vSphere 4 has been deleted.	"Notation" in Preface, 6.3, 7.2, 8.3	
Information related to the ETERNUS DX80/DX90 has been deleted.	"Notation" in Preface, 1.3, 1.4, 12.3.3	
Information related to the ETERNUS AF250/AF650 has been added.	"Notation" and "Others" in Preface, 1.3, 1.4, 4.2, 5.1.2, 6.3, 11.3.1, 12.3.3	
Information related to the ETERNUS LT60 has been deleted.	"Notation" in Preface	
Information related to Microsoft Windows Server 2003 has been deleted.	"Notation" in Preface	4
Information related to Windows 10 has been added.	"Notation" in Preface	
The description about SNMPv3 protocol has been added.	2.2, 4.2	
Information related to the ETERNUS DX8700 S3/DX8900 S3 has been added.	"Notation" in Preface	3.2
Information related to the NetApp FAS Series and V-Series has been added.	"Notation" in Preface, 6.3, 9.1	

Content of Update	Updated Section	Revision
The term "VMware Virtual Volumes" has been changed to "VMware vSphere Virtual Volumes" according to the terms used by VMware, Inc.	Throughout this manual	3.1
Information related to VMware vSphere 6 has been added.	"Notation" in Preface	
Information related to the ETERNUS DX200F has been modified or added.	"Others" in Preface, 1.3, 1.4, 4.2, 5.1.2, 6.3, 11.3.1, 12.3.3	3
Information related to the ETERNUS DX60 S3 has been added.	"Notation" in Preface, 1.3, 1.4, 4.2, 5.1.2, 12.3.3	
Information related to the ETERNUS LT260 has been added.	"Notation" in Preface	
In "System Configuration Using Advanced Copy Function", information about the ETERNUS DX90 in the table has been corrected.	1.4	
The description for the Storage Cluster Continuous Copy function has been added.	11.1, 11.3.3, 11.4, 12.2.1, 14.2	
Information about survival monitoring of storage devices has been added.	6.2, 6.4	2
The server node has been added in the figure "Supported Hardware".	6.3	
The explanation of new features supported with Version 16.1 has been added.	10.4, 11.4	
Information in [Point] has been modified.	12.3.2	
Information related to the ETERNUS DX200F has been added.	"Others" in Preface	1.1

Contents

Part 1　　Express

Chapter 1   System Design Before Express Installation

This chapter explains the system design required before Express installation.
Before reading this chapter, check the cautions and limitations mentioned in the software guide.

1.1   Choosing Management Server

Express's manager has to process requests from Web Console as well as various events and data acquisition coming from the managed hardware. To avoid interferences from other software or insufficient physical resources and ensure smooth operations, it is recommended to install Express on its own dedicated server. If a dedicated server cannot be secured, the Management Server should be chosen according to the following requirements:

- Impact on business applications

   On a server running business applications (hereafter described as "business server"), Express's manager operations will likely have an impact on other applications performance. If the candidate server is a mission critical server running financial, distribution or public utilities applications, the decision to install Express's manager must be evaluated with extra caution.

- Impact on other guest OS (for virtual server environment)

   In a virtual server environment, the physical server resources (CPU, memory, and network) are shared by multiple guest OS. Therefore, the operations of a guest OS have an impact on the other guest OS performance. Before installing Express's manager on a guest OS, usage of physical resources and role of other guest OS must be evaluated carefully.

- Incompatible software

   Express's manager cannot run on the same server concurrently to certain other software (hereafter described as "incompatible software"). A server with no incompatible software must be selected.

See
Refer to "Operating Environment of ETERNUS SF Manager" in the *Installation and Setup Guide* for information on the incompatible software.

1.2   Collecting Information Required for Installation

When Express is installed, the following information items are required:

Items	Required Information
License	- Software license to use Express
Server	- Server name - Server IP address - Type of connection between the server and the storage systems - HBA host ID
Storage device	- IP address of storage device - User name and password for storage device - SNMP community name (when using SNMPv1 protocol) - SNMP username, authentication method, authentication password, encryption method, and encryption password (when using SNMPv3 protocol)
Volume	- Volume name - Volume capacity

Items	Required Information
	- Volume type
	- Number of volumes to create
RAID Group	- RAID group name
	- RAID level
	- CM number
	- Number of disks in the RAID group
Advanced Copy function	- Copy table size
	- Proportion
E-mail	- Destination E-mail addresses
	- Source E-mail address
	- IP address and port number of the SMTP server
Host interface	- Host interface type
	- iSCSI name and IP address of the corresponding port
	- Use of Host affinity or not

 See

Refer to "License Management" in the *Installation and Setup Guide* for information on the license.

Chapter 2 Express Installation and Setup

This chapter explains the installation and setup procedures of Express.
In case of update from a previous version to the latest version, refer to the *Migration Guide*.

2.1 Overview of Installation Procedure

The ETERNUS SF Manager must be installed to use Express.
The overview of the installation procedure of ETERNUS SF Manager is shown below.

1. Check if the target server satisfies the hardware and software requirements for the ETERNUS SF Manager installation.

   Refer to "Operating Environment of ETERNUS SF Manager" in the *Installation and Setup Guide* for information on each condition.

2. Install the ETERNUS SF Manager.

   Refer to "Installation of ETERNUS SF Manager" in the *Installation and Setup Guide* for information on the installation procedure.

2.2 Setup Overview

The overview of the procedure for setting up the ETERNUS SF Manager as the Express Manager is shown below.
Refer to "Setup of ETERNUS SF Manager" in the *Installation and Setup Guide* for information on the setup procedure.

1. Create and register a user account that will be using Express.

   The possible operations by the user are dependent on the level of permission the user account is given. The following table describes the differences:

ESF Admin Role	OS Administrator Privilege	
	Yes	No
Yes	Operations are possible from Web Console and the command line.	Operations are possible only from Web Console.
No	Operations are possible only from the command line.	Operations are neither possible from Web Console nor from the command line.

   ### P Point
   ....

   - On systems using Single Sign-on, a created user account should be registered in the corresponding account authentication system so that the user can login to the Management Server. For example, on a Windows environment, if the Management Server belongs to an Active Directory domain, the user must be added to the Active Directory domain.

   - Commands can be executed only by users with OS administrator privileges or users belonging to the OS administrators group.
   ....

2. Set up the firewall.

   The firewall must be set up so that the remote PC where Web Console will be used can connect to the Management Server.

3. Launch Web Console, and then check that the user registered by step 1 can login to the Management Server from Web Console.

   Refer to "Supported Web Browsers" in the *Web Console Guide* for the version level of the supported web browsers.

Point

From the "Chapter 3 Configuration of Express Operating Environment" chapter on, the described tasks are supposed to be performed from Web Console. Before proceeding, it is therefore important to check that Express can actually be operated from Web Console.

Chapter 3 Configuration of Express Operating Environment

3.1 Configuring Network Environment

If a firewall is installed between the Management Server and the Managed Server, or between the Management Server and the Managed device, the network environment must be setup so that the SNMP Traps emitted by the Managed device or the Managed Server can be sent to the Management Server.
Refer to the following section in the *Installation and Setup Guide* for information on the procedures.
"Setup of ETERNUS SF Manager" > "Setup of Express's Manager" > "Configuring Network Environment"

3.2 Setting Storage System

The following procedure is required to set up the storage devices managed with Express:

1. Set the following properties for the storage devices to manage and then register them in Express.

    - IP address of the Management Server

    - Enable the SNMP function of MNT port

    - Created SSH server key (for the storage devices excluding the ETERNUS DX60 S2)

    - Created Software Role Account (for the storage devices excluding the ETERNUS DX60 S2)

    - SNMP community name (for the storage devices excluding the ETERNUS DX60 S2 and for using the SNMPv1 protocol)

    - SNMP username, authentication method, authentication password, encryption method, and encryption password (for the storage devices excluding the ETERNUS DX60 S2 and for using the SNMPv3 protocol)

    Refer to "Registering Disk Storage Systems" in the *Express Operation Guide* for information on the procedure.

2. Register the Managed Servers used for ETERNUS Disk storage system in Express.

    Refer to "Registering Servers" in the *Express Operation Guide* for information on the procedure.

3. Create RAID groups in ETERNUS Disk storage system managed by Express.

    Refer to "Create RAID Group" in the *Web Console Guide* for information on the procedure.

4. Create volumes in ETERNUS Disk storage system.

    Refer to "Create Volume" in the *Web Console Guide* for information on the procedure.

5. Assign volumes in ETERNUS Disk storage system to Managed Servers.

    Refer to "Volume Allocation Wizard" of "Environment Configuration Using Wizard" in the *Express Operation Guide* for information on the procedure.

![Information icon] Information
....
Steps from 2 to 5 of the above procedure are supported by a wizard in Express to make them easier. Refer to "Storage Configuration Wizard" in "Environment Configuration Using Wizard" in the *Express Operation Guide* for information on the wizard.
....

3.3 Checking SNMP Trap Reception

The purpose of the SNMP Trap test is to check that events generated by the storage devices are properly displayed in Express's manager.
Refer to "Event Notification Test" in the *Express Operation Guide* for information on the procedure.

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If the system is operated in a state where events cannot be displayed, problems will not be detected or detected too late and create a possibility that the system will not work properly. It is therefore important to check that the events generated by the storage devices are properly displayed.
. . . .

3.4   Configuring Advanced Copy

If you use the Advanced Copy function of ETERNUS Disk storage system, the environment has to be configured accordingly.

- For ETERNUS Disk storage system using the Copy command via SAN:

    1. Access volume settings

    2. Connection method settings

    3. Advanced Copy settings

- For ETERNUS Disk storage system using the Copy command via LAN:

    1. Connection method settings

    2. Advanced Copy settings

P **Point**
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For the ETERNUS Disk storage system using the Copy command via LAN, access volume settings are not needed.
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- Refer to "Access Volume Settings" in the *Express Operation Guide* for information on the access volume settings.

- Refer to "Connection Type Settings" in the *Express Operation Guide* for information on the connection method settings.

- Refer to "Copy Table Size Settings" in the *Express Operation Guide* for information on the Advanced Copy settings.
. . . .

3.5   Backing Up Setup Information

The Express's manager setting information should be backed up to prevent its loss in case of a failure of the Management Server.
Refer to the following sections in the *Express Operation Guide* for information on the procedure.

- For Windows environments

    "Backing Up Express's Manager Environment (Windows)"

- For Linux environments

    "Backing Up Express's Manager Environment (Linux)"

Chapter 4 Start Express Operation

This chapter explains how to start the Express operation.

4.1 Monitoring and Managing Storage Systems

This explains how to verify the operation and load status for storage systems.

4.1.1 Performance Monitoring

Performance monitoring of ETERNUS Disk storage systems is possible with Express.

Performance monitoring can be performed by selecting a storage device previously registered in "3.2 Setting Storage System" in Web Console.
Refer to "Performance Management" in the *Express Operation Guide* for information on the procedures.

4.1.2 Storage Capacity Virtualization Operation by Using Thin Provisioning

For ETERNUS Disk storage systems (excluding the ETERNUS DX60 S2), storage capacity virtualization operation can be done by using the Thin Provisioning function.

There are two methods to start the Thin Provisioning operation for ETERNUS Disk storage systems:

- By registering the storage device where Thin Provisioning is enabled

- By updating the system information on Web Console after the Thin Provisioning is enabled on an already registered storage device

Refer to "Thin Provisioning Management" in the *Express Operation Guide* for information on the procedures.

4.2 Backing Up Data of Business Volumes

This explains how to backup the data of business volumes using the Advanced Copy function of ETERNUS Disk storage systems.

4.2.1 Executing Advanced Copy

The data of business volumes on the ETERNUS Disk storage systems can be backed up with the Advanced Copy function.
Refer to "Executing Advanced Copy" in the *Express Operation Guide* for information on the procedures.

4.2.2 Checking Copy Status and Cancelling Operation

When Advanced Copy is running, it is possible to check the copy progress status or cancel the copy operation from Web Console or via a command.
Refer to "Executing Advanced Copy" in the *Express Operation Guide* for information on the procedures.

Part 2　　Storage Cruiser

Chapter 5　System Design Before Storage Cruiser Installation

This chapter explains the system design required before the Storage Cruiser installation.
Before reading this chapter, check the cautions and limitations mentioned in the software guide.

5.1　Choosing Management Server

Storage Cruiser's manager has to process requests from Web Console as well as various events and data acquisition coming from the managed hardware. To avoid interferences from other software or insufficient physical resources and ensure smooth operations, it is recommended to install Storage Cruiser's manager on its own dedicated server. If a dedicated server cannot be secured, the Management Server should be chosen according to the following requirements:

- Impact on business applications

  On a server running business applications (hereafter described as "business server"), Storage Cruiser's manager operations will likely have an impact on other applications performance. If the candidate server is a mission critical server running financial, distribution or public utilities applications, the decision to install Storage Cruiser's manager must be evaluated with extra caution.

- Impact on other guest OS (for virtual server environment)

  In a virtual server environment, the physical server resources (CPU, memory, and network) are shared by multiple guest OS. Therefore, the operations of a guest OS have an impact on the other guest OS performance. Before installing Storage Cruiser's manager on a guest OS, usage of physical resources and role of other guest OS must be evaluated carefully.

- Incompatible software

  Storage Cruiser's manager cannot run on the same server concurrently to certain other software (hereafter described as "incompatible software"). A server with no incompatible software must be selected.

📚 See
....
Refer to "Operating Environment of ETERNUS SF Manager" in the *Installation and Setup Guide* for information on the incompatible software.
....

5.2　Selecting Agent Installation

Storage Cruiser provides the following two types for server monitoring models.

- Monitoring without the Storage Cruiser's agent installed

- Monitoring with the Storage Cruiser's agent installed

Refer to the following selection criteria and choose the monitoring condition accordingly.

Monitoring Model	Selection Criteria
Monitoring without agent installed (agent-less monitoring)	- If the OS installed to the Managed Server is not supported by the Storage Cruiser's agent.
	- The HBA built into the Managed Server is not supported by the Storage Cruiser's agent.
	- If the Storage Cruiser's agent cannot be installed on the Managed Server. For example, if installation of applications is not permitted on the Managed Server outside a restricted set of applications, or if an incompatible software application is already installed on the server.

Monitoring Model	Selection Criteria
	- If you want to reduce the maintenance tasks on the Managed Server. For example, if you want to avoid having to apply patches on the software. - If using Storage Cruiser under the VMware vSphere environment. Since direct connections are made with VMware ESX or VMware ESXi, and the VM host and VM guest information is displayed, installation of the Storage Cruiser's agent is not necessary.
Monitoring with agent installed (agent-used monitoring)	- If you want to use some of the functions available when the Storage Cruiser's agent is installed. Access path settings, status monitoring, and fault monitoring, etc.

 See

- Refer to "Support Levels" in the *Storage Cruiser Operation Guide* for the difference in functions between agent-less monitoring and agent-used monitoring.

- Refer to "Operating Environment of Storage Cruiser's Agent" in the *Installation and Setup Guide* for information on the incompatible software for the Storage Cruiser's agent.

5.3   Collecting Information Required for Installation

When Storage Cruiser is installed, the following information items are required:

Required Information	Server Necessary for Information Collection
Information for installation destination server - OS type and version level - IP address - Clustered system or non-clustered system?	- Server to which ETERNUS SF Manager is to be installed - Server to which Storage Cruiser's agent is to be installed
Disk space needed for installation	- Server to which ETERNUS SF Manager is to be installed - Server to which Storage Cruiser's agent is to be installed
Port numbers availability for operation	- Server to which ETERNUS SF Manager is to be installed - Server to which Storage Cruiser's agent is to be installed
Disk space of the database needed for operation	- Server to which ETERNUS SF Manager is to be installed
Whether or not performance management is being done	- Server to which ETERNUS SF Manager is to be installed
Required disk space and memory needed for operation	- Server to which ETERNUS SF Manager is to be installed - Server to which Storage Cruiser's agent is to be installed
Software license for the use of Storage Cruiser	Not information necessary for individual server units. Prepare the license for the device to be managed.

 See

Refer to the following sections in the *Installation and Setup Guide* for the information required for installation.

- "Operating Environment of ETERNUS SF Manager"

- "Operating Environment of Storage Cruiser's Agent"

Chapter 6 Storage Cruiser Installation and Setup

This chapter explains the installation and setup procedures of Storage Cruiser.
In the case of upgrade from a previous version to the latest version, refer to the *Migration Guide*.

6.1 Installation of ETERNUS SF Manager

The ETERNUS SF Manager must be installed to use Storage Cruiser.
The overview of the installation procedure of ETERNUS SF Manager is shown below.

1. Check if the target server satisfies the hardware and software requirements for the ETERNUS SF Manager installation.

   Refer to "Operating Environment of ETERNUS SF Manager" in the *Installation and Setup Guide* for information on each condition.

2. Install the ETERNUS SF Manager.

   Refer to "Installation of ETERNUS SF Manager" in the *Installation and Setup Guide* for information on the installation procedure.

🖼 See
. . . .
Refer to the *Cluster Environment Setup Guide* for the installation procedures to a clustered system.
. . . .

6.2 Setup of ETERNUS SF Manager

The overview of the procedure for setting up the ETERNUS SF Manager as the Storage Cruiser's manager is shown below.
Refer to "Setup of ETERNUS SF Manager" in the *Installation and Setup Guide* for information on the setup procedure.

1. Create and register a user account that will be using Storage Cruiser.

   The possible operations by the user are dependent on the level of permission the user account is given. The following table describes the differences:

ESF Admin Role	OS Administrator Privilege	
	Yes	No
Yes	Operations are possible from Web Console and the command line.	Operations are possible only from Web Console.
No	Operations are possible only from the command line.	Operations are neither possible from Web Console nor from the command line.

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- On systems using Single Sign-on, a created user account should be registered in the corresponding account authentication system so that the user can login to the Management Server. For example, on a Windows environment, if the Management Server belongs to an Active Directory domain, the user must be added to the Active Directory domain.

- Commands can be executed only by users with OS administrator privileges or users belonging to the OS administrators group.
. . . .

2. Set up the firewall.

   The firewall must be set up so that the remote PC where Web Console will be used can connect to the Management Server.

3. Launch Web Console, and then check that the user registered by step 1 can login to the Management Server from Web Console.

   Refer to "Supported Web Browsers" in the *Web Console Guide* for the version level of the supported web browsers.

   ## 🅿 Point
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   From the "Chapter 7 Configuration of Storage Cruiser Operating Environment" chapter on, the described tasks are supposed to be performed from Web Console. Before proceeding, it is therefore important to check that Storage Cruiser can actually be operated from Web Console.
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4. A Storage Cruiser license must be registered for each of the ETERNUS Disk storage systems managed in Storage Cruiser.

   ## 🅿 Point
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   There are two ways of registering a license, from Web Console or from the command line.
   However, use the command line interface to register a license in this time.

   License registration from Web Console is possible only for ETERNUS Disk storage systems already managed in Storage Cruiser. Registration for the ETERNUS Disk storage systems not yet managed in Storage Cruiser is possible from the command line.

   Registration from Web Console becomes possible after "7.2 Registering Device".
   ....

   Refer to "License Management" in the *Installation and Setup Guide* for information on the license and registering procedure.

6.3 Installation of Storage Cruiser's Agent

The overview of the installation procedure of Storage Cruiser's agent is shown below.

🅿 Point
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It is not necessary to install the Storage Cruiser's agent under the VMware vSphere environment.
....

1. Check if the target server satisfies the hardware and software requirements for the Storage Cruiser's agent installation.

   Refer to "Operating Environment of Storage Cruiser's Agent" in the *Installation and Setup Guide* for information on each condition.

2. Install the Storage Cruiser's agent.

   Refer to "Installation of Storage Cruiser's Agent" in the *Installation and Setup Guide* for information on the installation procedure.

6.4 Setup of Storage Cruiser's Agent

For the setup of the Storage Cruiser's agent, it is necessary to set up such things as the port numbers to be used and the SNIA HBA API library.

The items and procedures necessary for setup vary according to OS. Refer to the part detailing one's OS in "Setup of Storage Cruiser's Agent" in the *Installation and Setup Guide*.

Chapter 7   Configuration of Storage Cruiser Operating Environment

7.1   Setting Up to Manage Devices

Perform the necessary setup for the devices to be monitored / managed by Storage Cruiser.

Servers

So that Storage Cruiser can manage the HBA built into the Managed Server to which the Storage Cruiser's agent has been installed, install the SNIA HBA API library that HBA vendor distributes.
Refer to the *SNIA HBA API Library Installation Guide* at the following URL for the installation method for the HBA API library.

```
https://www.fujitsu.com/global/support/products/computing/storage/manuals-list.html
```

Fibre Channel Switches

So that Storage Cruiser can manage Fibre Channel switch devices, first, perform setup to them.
Refer to "Fibre Channel Switch" in "Environment Configuration" in the *Storage Cruiser Operation Guide* for items and procedures pertaining to setup.

Disk Storage Systems

So that Storage Cruiser can manage ETERNUS Disk storage systems, first, perform setup to them.
Refer to "Disk Storage Systems and All-Flash Arrays" in "Environment Configuration" in the *Storage Cruiser Operation Guide* for items and procedures pertaining to setup.

Network Attached Storages

So that Storage Cruiser can manage NetApp FAS Series, FAS Series (with clustered Data ONTAP), and AFF A series, first, perform setup to them.

Refer to "NetApp FAS Series, FAS Series (with clustered Data ONTAP), and AFF A series Network Disk Storage System" in "Environment Configuration" in the *Storage Cruiser Operation Guide* for items and procedures pertaining to setup.

Tape Libraries

So that Storage Cruiser can manage tape library devices, first, perform setup to them.
Refer to "Tape Library Devices" in "Environment Configuration" in the *Storage Cruiser Operation Guide* for items and procedures pertaining to setup.

7.2   Registering Device

For the managing of devices with Storage Cruiser, register the managed devices to Storage Cruiser.
Refer to "Registering Device" in the *Storage Cruiser Operation Guide* for information on the procedure.

7.3   Registering License

If the ETERNUS Disk storage system just registered in Storage Cruiser does not have a Storage Cruiser license, register the Storage Cruiser license for it.

 Point

The license registration can be performed either from Web Console or from the command line.
Refer to "License Management" in the *Installation and Setup Guide* for information on the license and registering procedure.

7.4   Checking SNMP Trap Reception

The purpose of the SNMP Trap test is to check that events generated by the storage devices are properly displayed in Storage Cruiser.
Refer to the following sections in the *Storage Cruiser Operation Guide* for information on the procedures:

- "swtraptest (SNMP Trap Test for Fibre Channel Switch)"

- "grtraptest (SNMP Trap Test for ETERNUS Disk Storage System)"

 Point

If the system is operated in a state where events cannot be displayed, problems will not be detected or detected too late and create a possibility that the system will not work properly. It is therefore important to check that the events generated by the storage devices are properly displayed.

7.5   Backing Up Setup Information

The Storage Cruiser's manager setting information should be backed up to prevent its loss in case of a failure of the Management Server.
Refer to "Backup of Manager" in the *Storage Cruiser Operation Guide* for information on the procedures.

Chapter 8   Start Storage Cruiser Operation

This chapter explains how to start the Storage Cruiser operation.

8.1   Performance Monitoring

Performance monitoring of the Fibre Channel switch and ETERNUS Disk storage system is possible with Storage Cruiser.

Performance monitoring can be performed by selecting a storage device previously registered in "7.2 Registering Device".

Refer to "Performance Management" in the *Storage Cruiser Operation Guide* for information on the procedure.

8.2   Energy-saving Operation for Storage Device by Using Eco-mode

Storage Cruiser can achieve the energy-saving operation by using the Eco-mode function of ETERNUS Disk storage system.

For Eco-mode, there is "storage device Eco-mode" and "RAID Group Eco-mode". One can set each Eco-mode ON or OFF separately, so it is possible to achieve a meticulously energy-saving operation.

Refer to "How to Control Eco-mode" in the *Storage Cruiser Operation Guide* for information on the procedure.

8.3   Storage Capacity Virtualization Operation by Using Thin Provisioning

Storage Cruiser can achieve the storage capacity virtualization operation by using the Thin Provisioning function of ETERNUS Disk storage system.

There are two methods to start the Thin Provisioning operation for the ETERNUS Disk storage systems:

- By registering ETERNUS Disk storage systems where Thin Provisioning is enabled

- By updating the system information on Web Console after the Thin Provisioning is enabled on an already registered ETERNUS Disk storage system

Refer to "Thin Provisioning Management" in the *Storage Cruiser Operation Guide* for information on the procedures.

8.4   High Availability Operation for Storage Device by Using Storage Cluster Function

Storage Cruiser can achieve high availability operation for storage devices by using the Storage Cluster function.

Refer to "Storage Cluster Function" in the *Storage Cruiser Operation Guide* for information on the procedures.

Part 3　　AdvancedCopy Manager

Chapter 9 System Design Before AdvancedCopy Manager Installation

This chapter explains the system design required before the AdvancedCopy Manager installation.
Before reading this chapter, check the cautions and limitations mentioned in the software guide.

9.1 Choice of Operating Model

With AdvancedCopy Manager, the following two operating modes are available:

- Agent-based operating model

  This operating model requires the installation of ETERNUS SF Manager and the AdvancedCopy Manager's agent. Use of this operating model requires that the installed ETERNUS SF Manager be set up as the AdvancedCopy Manager's manager.

  Application data copy is possible on a server where a business application is installed (hereafter "business server"). As a function to trigger scripts before and after the copy operation is provided, scripts can be customized to conform to the administration policies and allow flexible and optimized operations.

- Agent-less operating model

  This operating model requires the installation of AdvancedCopy Manager CCM.

  There is no need to install either ETERNUS SF Manager or AdvancedCopy Manager's agent, therefore the time to get ready to start is shorter compared to Agent-based operating model. Moreover, as all the operations can be done directly on the server where the CCM has been installed, there are no requirements about the OS environment of the business server.

  Unlike the copy operation with an agent, the copy is done per disk rather than per partition or slice. For this reason, the copy destination resource must be larger. Also, as copy is done without relation to the application running on the business server, the operator must ensure the integrity of the copied data. (for example, by performing the copy when the data is inactive).

Decide which operating model to use by considering the following criteria.

Operating Model	Choice Criteria
Agent-based	- If you want to use functions available when the AdvancedCopy Manager's agent is installed. For example, if you want to use Advanced Copy operations such as multiple generation backup management function, interaction with a DBMS on a business server, volume shadow copy service (VSS Volume Shadow Copy Service function), etc.
Agent-less	- If there are many business servers and you want to reduce the cost of installation and start operation as soon as possible. - If the OS on the business server is not supported by the AdvancedCopy Manager's manager or the AdvancedCopy Manager's agent. - If the AdvancedCopy Manager's agent cannot be installed on the business server. For example, if installation of applications is not permitted on the business server outside a restricted set of applications, or if an incompatible software application is already installed on the server. - If you want to reduce the maintenance tasks on the business server. For example, if you want to avoid having to apply patches on the software.

Note

It is possible to have operating models with Agent-based and Agent-less at the same time, but when operated in parallel, the copy data of both operating models must not have common areas.
If the copy data of both operating models have common areas, there is a possibility of data loss when copy operations use the mutual areas.

See

Refer to the following sections of the *Installation and Setup Guide* for details about incompatible software with AdvancedCopy Manager.

- Agent-based operating model:

   "Operating Environment of ETERNUS SF Manager" and "Operating Environment of AdvancedCopy Manager's Agent"

- Agent-less operating model:

   "Operating Environment of AdvancedCopy Manager CCM"

9.2 System Design for Agent-Based Operating Model

This section explains the required tasks to perform before the installation and configuration of Agent-based operating model.

9.2.1 Selecting Function to Use

With Agent-based operating model, the following two functions are available:

- Backup management function

   This function allows maintaining multiple generations of the copied data.
   Unlike the data copied with the replication management function, the data copied with backup cannot be used outside this function.

   By setting a backup policy, the backup can be performed according to that policy.
   This function creates multiple generations of the copied data. When performing a restoration, any one of the backup generations can be chosen and restored.

   However, this function does not support data copy to a different ETERNUS Disk storage system. To copy data over to a different ETERNUS Disk storage system, use the replication management function.

   ## Note

   This function does not support the Storage Cluster Continuous Copy function.

- Replication management function

   This function allows using the copy data differently from a backup (for example, using the copied data in a business application, etc).
   Copy to a different ETERNUS Disk storage system, including a remote location, is possible.

   A replication data source and destination areas are defined as a pair, and data are copied inside this pair. As multi-generation data management is not supported by the replication management function, several pairs must be defined for one data source and multiple data destinations.

Refer to the following selection criteria and decide the function to use.

Function	Choice Criteria
Backup management function	- If you need to keep multiple generations of the data copied in AdvancedCopy Manager.
Replication management function	- If you want to use the copied data outside a backup dataset. - If you want to copy between volumes that are connected to different servers - If you want to copy between volumes that are residing on different ETERNUS Disk storage systems. - If you want to backup data from Microsoft Exchange Server. The backup management function does not support copying data from Microsoft Exchange Server. - If you want to backup data from a Hyper-V Guest OS. The backup management function does not support copying data from Hyper-V Guest OS. - If you want to use the Storage Cluster Continuous Copy function.

9.2.2 Choosing Management Server

AdvancedCopy Manager's manager has to process requests from Web Console as well as various events and data acquisition coming from the managed hardware. To avoid interferences from other software or insufficient physical resources and ensure smooth operations, it is recommended to install AdvancedCopy Manager's manager on its own dedicated server. If a dedicated server cannot be secured, the Management Server should be chosen according to the following requirements:

Impact on Business Applications

On a server running business applications (hereafter described as "business server"), AdvancedCopy Manager's manager operations will likely have an impact on other applications performance. If the candidate server is a mission critical server running financial, distribution or public utilities applications, the decision to install AdvancedCopy Manager's manager must be evaluated with extra caution.

Impact on Other Guest OS (for Virtual Server Environment)

In a virtual server environment, the physical server resources (CPU, memory, and network) are shared by multiple guest OS. Therefore, the operations of a guest OS have an impact on the other guest OS performance. Before installing AdvancedCopy Manager's manager on a guest OS, usage of physical resources and role of other guest OS must be evaluated carefully.

Incompatible Software

AdvancedCopy Manager's manager cannot run on the same server concurrently to certain other software (hereafter described as "incompatible software"). A server with no incompatible software must be selected.

See

Refer to "Operating Environment of ETERNUS SF Manager" in the *Installation and Setup Guide* for information on the incompatible software.

9.2.3 Collecting Information Required for Installation

When AdvancedCopy Manager is installed, the following information items are required:

Required Information	Server Necessary for Information Collection
Information for installation destination server - OS type and version level	- Server to which ETERNUS SF Manager is to be installed - Server to which AdvancedCopy Manager's agent is to be installed

Required Information	Server Necessary for Information Collection
- IP address - Clustered system or non-clustered system?	
Disk space needed for installation	- Server to which ETERNUS SF Manager is to be installed - Server to which AdvancedCopy Manager's agent is to be installed
Port numbers availability for operation	- Server to which ETERNUS SF Manager is to be installed - Server to which AdvancedCopy Manager's agent is to be installed
Disk space of the database needed for operation	- Server to which ETERNUS SF Manager is to be installed
Required disk space and memory needed for operation	- Server to which ETERNUS SF Manager is to be installed - Server to which AdvancedCopy Manager's agent is to be installed
Software license for the use of AdvancedCopy Manager	The AdvancedCopy Manager software licenses are based on the ETERNUS Disk storage system to be managed. Prepare the license(s) for each of the ETERNUS Disk storage systems to be managed. Each ETERNUS Disk storage system to be managed may have a local and/or remote copy license.

See

Refer to the following sections in the *Installation and Setup Guide* for the information required for installation.

- "Operating Environment of ETERNUS SF Manager"

- "Operating Environment of AdvancedCopy Manager's Agent"

- "License Management"

9.3 System Design for Agent-Less Operating Model

This section explains the required tasks to perform before the installation and configuration of Agent-less operating model.

9.3.1 Choosing CCM Server

AdvancedCopy Manager CCM has to process requests from Web Console as well as various events and data acquisition coming from the managed hardware. To avoid interferences from other software or insufficient physical resources and ensure smooth operations, it is recommended to install AdvancedCopy Manager CCM on its own dedicated server. If a dedicated server cannot be secured, the server should be chosen according to the following requirements:

- Impact on business applications

  On a server running business applications (hereafter described as "business server"), AdvancedCopy Manager CCM operations will likely have an impact on other applications performance. If the candidate server is a mission critical server running financial, distribution or public utilities applications, the decision to install AdvancedCopy Manager CCM must be evaluated with extra caution.

- Impact on other guest OS (for virtual server environment)

  In a virtual server environment, the physical server resources (CPU, memory, and network) are shared by multiple guest OS. Therefore, the operations of a guest OS have an impact on the other guest OS performance. Before installing AdvancedCopy Manager CCM on a guest OS, usage of physical resources and role of other guest OS must be evaluated carefully.

- Incompatible software

    AdvancedCopy Manager CCM cannot run on the same server concurrently to certain other software (hereafter described as "incompatible software"). A server with no incompatible software must be selected.

![See icon] See
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Refer to "Operating Environment of AdvancedCopy Manager CCM" in the *Installation and Setup Guide* for information on the incompatible software.
· ·

9.3.2 Selecting Program to Install

AdvancedCopy Manager CCM can be installed using two methods.

- [Method 1] Install the ETERNUS SF Manager program and use the AdvancedCopy Manager CCM included in the ETERNUS SF Manager program

- [Method 2] Install and use the AdvancedCopy Manager CCM program only

![Point icon] Point
· ·

With method 1, in addition to the Command Line Interface, AdvancedCopy Manager CCM can be operated from Web Console. However, method 1 has the following additional requirements:

- The required disk space for installation is larger than method 2.

- There are more incompatible software applications than method 2.

- An estimate of the database size is required.

Select the program to install after considering these requirements.
· ·

9.3.3 Selecting Advanced Copy Control Method

In AdvancedCopy Manager CCM, the CM Server sends a command to ETERNUS Disk storage system to perform an Advanced Copy function. There are two available methods for sending the copy command:

- Sending a command to ETERNUS Disk storage system to perform an Advanced Copy function from the server over the SAN (hereafter referred to as "Copy command via SAN")

- Sending a command to ETERNUS Disk storage system to perform an Advanced Copy function from the server over the LAN (hereafter referred to as "Copy command via LAN")

With AdvancedCopy Manager CCM, the ETERNUS Disk storage systems listed below can use Copy command via SAN and via LAN.

Table 9.1 ETERNUS Disk Storage Systems That Can Be Operated by Copy Command via SAN or via LAN

Device Name	Copy Command via SAN		Copy Command via LAN	
	Operation	Firmware Version	Operation	Firmware Version
ETERNUS AF All-Flash Arrays ETERNUS DX series (excluding the ETERNUS DX60 S2)	A	All versions	A	All versions
ETERNUS DX60 S2	A	All versions	N/A	-

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

When using the Copy command via SAN method, a logical volume that can be accessed from the CCM Server is needed in ETERNUS Disk storage system. In this manual, this logical volume is called "access volume". One logical volume of ETERNUS Disk storage system must be assigned to CCM Server as the access volume.

Figure 9.1 Example of System Configuration Using Copy Command via SAN
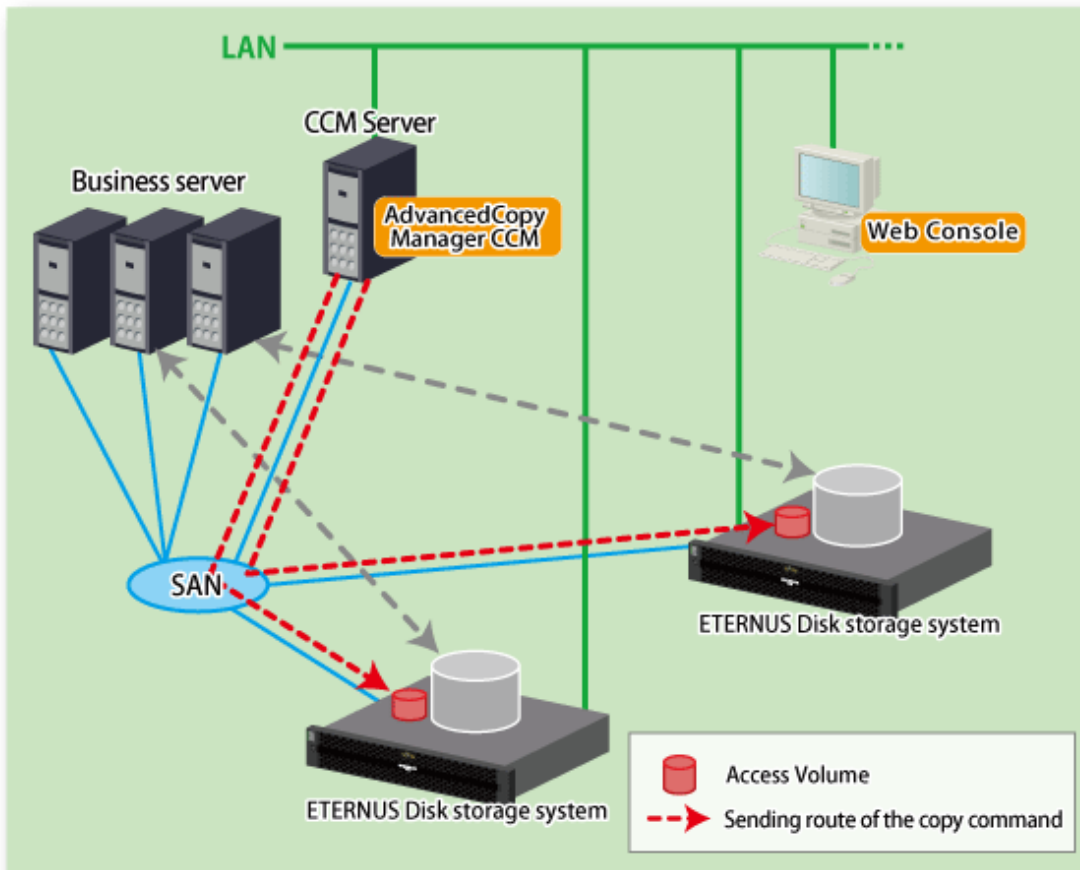
When using the Copy command via LAN method, no access volume is needed.

Figure 9.2 Example of System Configuration Using Copy Command via LAN
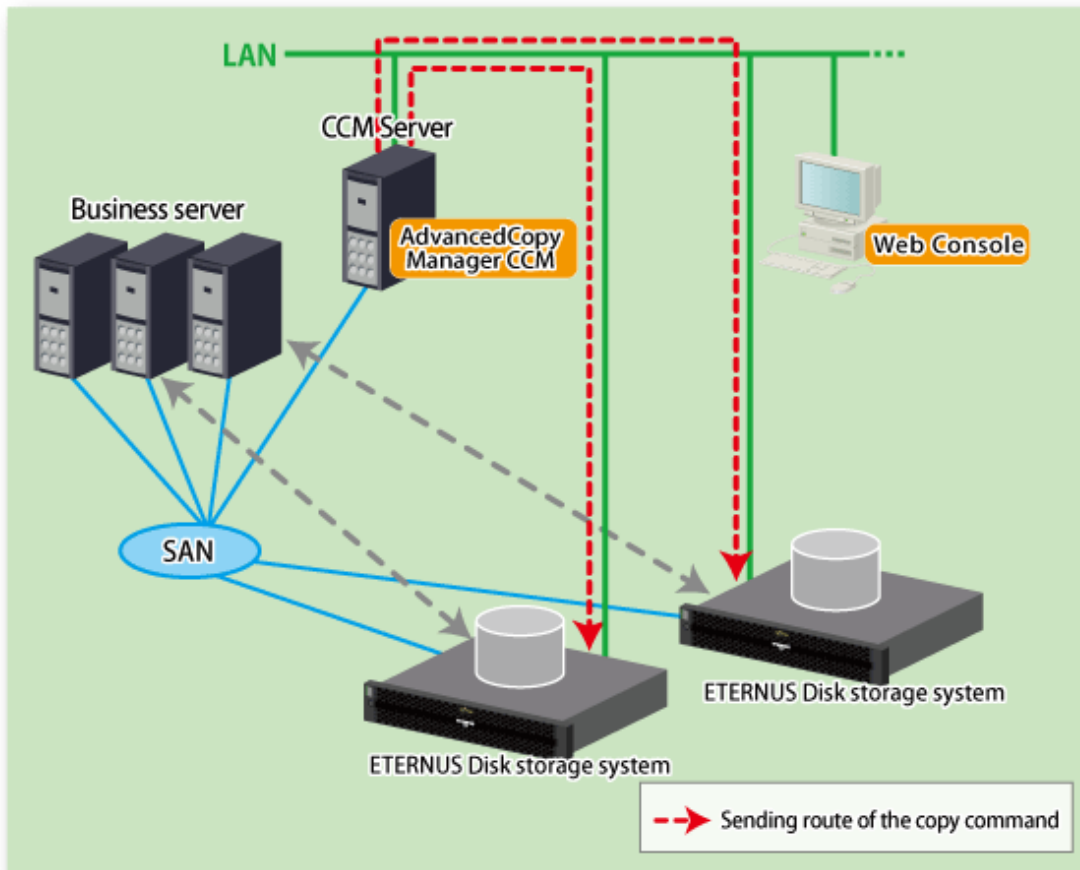
📖 Information
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Among the ETERNUS Disk storage systems described in "Table 9.1 ETERNUS Disk Storage Systems That Can Be Operated by Copy Command via SAN or via LAN", some models do not support the Copy command via LAN. In case of a system environment where not all managed ETERNUS Disk storage systems support the Copy command via LAN, it is recommended to use only the Copy command via SAN.
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9.3.4   Collecting Information Required for Installation

When AdvancedCopy Manager CCM is installed, the following information items are required:

Required Information	Necessary for Information Collection	
	Using AdvancedCopy Manager CCM Included in ETERNUS SF Manager	Using AdvancedCopy Manager CCM to Be Install Individually
Information for installation destination server - OS type and version level - IP address - Clustered system or non-clustered system?	Necessary	Necessary
Disk space needed for installation	Necessary	Necessary
Port numbers availability for operation	Necessary (*1)	No necessary

Required Information	Necessary for Information Collection	
	Using AdvancedCopy Manager CCM Included in ETERNUS SF Manager	Using AdvancedCopy Manager CCM to Be Install Individually
Disk space of the database needed for operation	Necessary (*1)	No necessary
Required disk space and memory needed for operation	Necessary	Necessary
Software license for the use of AdvancedCopy Manager (*2)	Necessary	Necessary

*1: This information is required for ETERNUS SF Manager.
*2: Prepare the license for the ETERNUS Disk storage system to be managed.

 See
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Refer to the following sections in the *Installation and Setup Guide* for the information required for installation.

- If using AdvancedCopy Manager CCM included in ETERNUS SF Manager:

    - "Operating Environment of ETERNUS SF Manager"

    - "License Management"

- If using AdvancedCopy Manager CCM to be installed individually:

    - "Operating Environment of AdvancedCopy Manager CCM"

    - "License Management"
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Chapter 10 Installation and Setup of Agent-Based Operation Model

This chapter explains the installation and setup procedures of Agent-based operation model.
In case of update from a previous version to the latest version, refer to the *Migration Guide*.

10.1 Installation of ETERNUS SF Manager

The ETERNUS SF Manager must be installed to use AdvancedCopy Manager's manager functions.
The overview of the installation procedure of ETERNUS SF Manager is shown below.

1. Check if the target server satisfies the hardware and software requirements for the ETERNUS SF Manager installation.

   Refer to "Operating Environment of ETERNUS SF Manager" in the *Installation and Setup Guide* for information on each condition.

2. Install the ETERNUS SF Manager.

   Refer to "Installation of ETERNUS SF Manager" in the *Installation and Setup Guide* for information on the installation procedure.

See
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Refer to the *Cluster Environment Setup Guide* for the procedures of the Installation to a clustered system.
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10.2 Setup of ETERNUS SF Manager

The overview of the procedure for setting up the ETERNUS SF Manager as the AdvancedCopy Manager's manager is shown below.
Refer to "Setup of ETERNUS SF Manager" in the *Installation and Setup Guide* for information on the setup procedure.

1. Create and register a user account that will be using AdvancedCopy Manager.

   The possible operations by the user are dependent on the level of permission the user account is given. The following table describes the differences:

ESF Admin Role	OS Administrator Privilege	
	Yes	No
Yes	Operations are possible from Web Console and the command line.	Operations are possible only from Web Console.
No	Operations are possible only from the command line.	Operations are neither possible from Web Console nor from the command line.

Point
. . . .
- On systems using Single Sign-on, a created user account should be registered in the corresponding account authentication system so that the user can login to the Management Server. For example, on a Windows environment, if the Management Server belongs to an Active Directory domain, the user must be added to the Active Directory domain.

- The commands of AdvancedCopy Manager can be executed only by the following users.

  - For Windows environments

    Local users belonging to the Administrators group or domain users belonging to the Domain Admins group

- For Solaris or Linux environments

    Users who have OS administrator privilege (root user)

2. Set up the firewall.

    The firewall must be set up so that the remote PC where Web Console will be used can connect to the Management Server.

3. Launch Web Console, and then check that the user registered by step 1 can login to the Management Server from Web Console.

    Refer to "Supported Web Browsers" in the *Web Console Guide* for the version level of the supported web browsers.

🅿 Point

From the "Chapter 11 Configuration of Agent-Based Operation Model Environment" chapter on, the described tasks are supposed to be performed from Web Console. Before proceeding, it is therefore important to check that AdvancedCopy Manager can actually be operated from Web Console.

4. Register the AdvancedCopy Manager licenses with the license management commands for all the ETERNUS Disk storage systems managed by AdvancedCopy Manager.

    Refer to "License Management" in the *Installation and Setup Guide* for information on the licenses and registering procedure.

10.3   Installation of AdvancedCopy Manager's Agent

The overview of the installation procedure of AdvancedCopy Manager's agent is shown below.

1. Check if the target server satisfies the hardware and software requirements for the AdvancedCopy Manager's agent installation.

    Refer to "Operating Environment of AdvancedCopy Manager's Agent" in the *Installation and Setup Guide* for information on each condition.

2. Install the AdvancedCopy Manager's agent.

    Refer to "Installation of AdvancedCopy Manager's Agent" in the *Installation and Setup Guide* for information on the installation procedure.

📚 See

Refer to the *Cluster Environment Setup Guide* for the procedures of the Installation to a clustered system.

10.4   Setup of AdvancedCopy Manager's Agent

To setup the AdvancedCopy Manager's agent, services and hardware configuration is required.
The items and procedures necessary for setup vary according to OS.

Refer to the part detailing one's OS in "Setup of AdvancedCopy Manager's Agent" in the *Installation and Setup Guide*.

Chapter 11 Configuration of Agent-Based Operation Model Environment

This chapter explains how to configure the Agent-based operation model environment.

11.1 Configuration of Environment Using Backup Management Function

This section describes the procedure for configuring the operating environment for backup management function.

1. Managed Server registration

   Register each Managed Server on the Management Server.
   Refer to "Registering Managed Server" in "Backup Operation" in the *AdvancedCopy Manager Operation Guide* for the operating system of the Managed Server for information on the procedure.

2. Device information collection

   Collect the information about the devices connected to the Managed Server.
   Refer to "Fetching Device Information on Managed Server" in "Backup Operation" in the *AdvancedCopy Manager Operation Guide* for the operating system of the Managed Server for information on the procedure.

3. Backup server environment configuration

   Decide and configure on which server the backup operations will be performed.
   Refer to "Configuring Environment for Backup Operation Server" in "Backup Operation" in the *AdvancedCopy Manager Operation Guide* for the operating system of the Managed Server for information on the procedure.

4. Volume type settings

   Set the type for volumes to be managed by AdvancedCopy Manager from among volumes fetched in step 2. Choose one of the following types for each volume:

   - Transaction volume

     This is a volume to be backed up (copy data source).

   - Backup volume

     This is a volume that will keep the backed up data (copy data destination).

   Refer to "Setting Operation Type for Device" in "Backup Operation" in the *AdvancedCopy Manager Operation Guide* for the operating system of the Managed Server for information on the procedure.

5. Backup policy settings

   Set the backup policy for each of the transaction volumes set up in step 4.

   - Preservation generations

   - Interval days

   Refer to "Setting Backup Policy" in "Backup Operation" in the *AdvancedCopy Manager Operation Guide* for the operating system of the Managed Server for information on the procedure.

6. Pre-processing and post-processing scripts customization

   If the specific pre-processing and post-processing is needed, customize the pre-processing and post-processing scripts for backup.
   Refer to "Pre-processing and Post-processing of Backup and Restoration" in the *AdvancedCopy Manager Operation Guide* for the operating system of the Managed Server for information on the procedure.

11.2 Configuration of Environment Using Replication Management Function

This section describes the procedure for configuring the operating environment for replication management function.

1. Managed Server registration

   Register each Managed Server on the Management Server.
   Refer to "Registering Managed Server" in "Replication" in the *AdvancedCopy Manager Operation Guide* for the operating system of the Managed Server for information on the procedure.

2. Storage Cluster environment settings (only when using the Storage Cluster Continuous Copy function)

   Set the Storage Cluster environment.
   Refer to "Storage Cluster Continuous Copy Function" in the *AdvancedCopy Manager Operation Guide* for the operating system of the Managed Server for information on the procedure.

3. Device information collection

   Collect the information about the devices connected to the Managed Server.
   Refer to "Fetching Device Information on Managed Server" in "Replication" in the *AdvancedCopy Manager Operation Guide* for the operating system of the Managed Server for information on the procedure.

4. Settings of volumes for replication

   Set the copy source and destination volumes used with the replication operation.
   Refer to "Configuring Source Volume and Replica Volume" in "Replication" in the *AdvancedCopy Manager Operation Guide* for the operating system of the Managed Server for information on the procedure.
   When using the Storage Cluster Continuous Copy function, only TFOV can be specified for the copy source and destination volumes.

5. Pre-processing and post-processing scripts customization

   If in one of the following 2 situations, customize the pre-processing and post-processing scripts for replication:

   - Specific processing needs to be added before or after replication.

   - The standard processing before or after the replication needs to be modified.

   Refer to "Pre-processing and Post-processing of Replication" in the *AdvancedCopy Manager Operation Guide* for the operating system of the Managed Server for information on the procedure.

11.3 Backing Up Setup Information

AdvancedCopy Manager setting information should be backed up to prevent its loss in case of a failure of the Management Server.
Refer to "Maintenance of Database" in the *AdvancedCopy Manager Operation Guide* for the using operating system for information on the procedure.

Chapter 12 Start Operation of Agent-Based Operation Model

This chapter explains how to start the operation of the Agent-based operation model.

12.1 Starting Operation Using Backup Management Function

This section explains how to do data backup using the backup management function.

12.1.1 Executing Backup

Perform a backup of the business data in the transaction volume by executing an Advanced Copy.

The backup volume is automatically selected.
However, it is possible to configure the relation between source volumes and destination volumes by using the "device map file".
Refer to the following sections under the chapter "Backup Operation" in the *AdvancedCopy Manager Operation Guide* for the using operating system for information on the procedure.

- "Performing Snapshot High-speed Backup"

- "Performing Synchronized High-speed Backup"

See

Refer to "Preparing Device Map File" in "Backup Operation" in the *AdvancedCopy Manager Operation Guide* for the using operating system for information on the device map file.

12.1.2 Checking Copy Status and Cancelling Operation

When Advanced Copy is running, it is possible to check the copy progress status or cancel the copy operation.
Refer to "Managing Backup History" in "Backup Operation" in the *AdvancedCopy Manager Operation Guide* for the using operating system for information on the procedure.

12.2 Starting Operation Using Replication Management Function

This section explains how to copy data using the replication management function.

12.2.1 Executing Replication

Copy from a source volume to a destination volume is possible by executing an Advanced Copy.
A data copy created with the replication management function can also be used as a backup.
Refer to the following sections under the chapter "Replication" in the *AdvancedCopy Manager Operation Guide* for the using operating system for information on the procedure.

- "Executing Snapshot Replication"

- "Executing Synchronized Replication"

12.2.2 Checking Copy Status and Cancelling Operation

When Advanced Copy is running, it is possible to check the copy progress status or cancel the copy operation.
Refer to the following sections under the chapter "Replication" in the *AdvancedCopy Manager Operation Guide* for the using operating system for information on the procedure.

- "Executing Snapshot Replication"

- "Executing Synchronized Replication"

- "Stopping Operation"

Chapter 13 Installation and Setup of Agent-Less Operation Model

This chapter explains the installation and setup procedures of Agent-less operation model.
In case of update from a previous version to the latest version, refer to the *Migration Guide*.

13.1 Installation of AdvancedCopy Manager CCM

There are two possible methods to install AdvancedCopy Manager CCM, as mentioned in "9.3.2 Selecting Program to Install".

When Using AdvancedCopy Manager CCM Included in ETERNUS SF Manager

Install the ETERNUS SF Manager. The overview of the installation procedure is shown below.

1. Check if the target server satisfies the hardware and software requirements for the ETERNUS SF Manager installation.

   Refer to "Operating Environment of ETERNUS SF Manager" in the *Installation and Setup Guide* for information on each condition.

2. Install the ETERNUS SF Manager.

   Refer to "Installation of ETERNUS SF Manager" in the *Installation and Setup Guide* for information on the installation procedure.

When Using AdvancedCopy Manager CCM to Be Installed Individually

Install the AdvancedCopy Manager CCM. The overview of the installation procedure is shown below.

1. Check if the target server satisfies the hardware and software requirements for the AdvancedCopy Manager CCM installation.

   Refer to "Operating Environment of AdvancedCopy Manager CCM" in the *Installation and Setup Guide* for information on each condition.

2. Install the AdvancedCopy Manager CCM.

   Refer to "Installation of AdvancedCopy Manager CCM" in the *Installation and Setup Guide* for information on the installation procedure.

13.2 Setup of AdvancedCopy Manager CCM

The overview of the procedure for setting up the AdvancedCopy Manager CCM is shown below.

When Using AdvancedCopy Manager CCM Included in ETERNUS SF Manager

The overview of the procedure for setting up the ETERNUS Manager as the AdvancedCopy Manager CCM is shown below.
Refer to "Setup of ETERNUS SF Manager" in the *Installation and Setup Guide* for information on the setup procedure.

1. Create and register a user account that will be using AdvancedCopy Manager CCM.

   The possible operations by the user are dependent on the level of permission the user account is given. The following table describes the differences:

ESF Admin Role	OS Administrator Privilege	
	Yes	No
Yes	Operations are possible from Web Console and the command line.	Operations are possible only from Web Console.

ESF Admin Role	OS Administrator Privilege	
	Yes	No
No	Operations are possible only from the command line.	Operations are neither possible from Web Console nor from the command line.

🅿 **Point**
. . . .

- On systems using Single Sign-on, a created user account should be registered in the corresponding account authentication system so that the user can login to the Management Server (also used as CCM Server). For example, on a Windows environment, if the Management Server belongs to an Active Directory domain, the user must be added to the Active Directory domain.

- The commands of AdvancedCopy Manager CCM can be executed only by the following users.

  - For Windows environments

    Local users belonging to the Administrators group or domain users belonging to the Domain Admins group

  - For Solaris or Linux environments

    Users who have OS administrator privilege (root user)

. . . .

2. Set up the firewall.

   The firewall must be set up so that the remote PC where Web Console will be used can connect to the Management Server.

3. Launch Web Console, and then check that the user registered by step 1 can login to the Management Server from Web Console.

   Refer to "Supported Web Browsers" in the *Web Console Guide* for the version level of the supported web browsers.

🅿 **Point**
. . . .

From the "Chapter 11 Configuration of Agent-Based Operation Model Environment" chapter on, the described tasks are supposed to be performed from Web Console. Before proceeding, it is therefore important to check that AdvancedCopy Manager can actually be operated from Web Console.
. . . .

4. Register the AdvancedCopy Manager licenses with the license management commands for all the ETERNUS Disk storage systems managed by AdvancedCopy Manager CCM.

   Refer to "License Management" in the *Installation and Setup Guide* for information on the licenses and registering procedure.

When using AdvancedCopy Manager CCM to Be Installed Individually

The overview of the procedure for setting up AdvancedCopy Manager CCM is shown below.
Refer to "Setup of AdvancedCopy Manager CCM" in the *Installation and Setup Guide* for information on the setup procedure.

1. Create and register a user account that will execute AdvancedCopy Manager CCM commands.

   The AdvancedCopy Manager CCM commands can be executed only by users with Administrator permissions or users belonging to the Administrators group. Take this requirement into account when creating and registering a user.

On systems using Single Sign-on, a created user account should be registered in the corresponding account authentication system so that the user can login to the CCM Server.
For example, if the CCM Server belongs to an Active Directory domain, the user must be added to the Active Directory domain.

2. Register the AdvancedCopy Manager licenses with the license management commands for all the ETERNUS Disk storage systems managed by AdvancedCopy Manager CCM.

   Refer to "License Management" in the *Installation and Setup Guide* for information on the licenses and registering procedure.

 Information

When the AdvancedCopy Manager CCM program is installed, AdvancedCopy Manager CCM functions cannot be operated from Web Console. Therefore, registration of a user for operating Web Console or firewall settings is not required.

Chapter 14 Configuration of Agent-Less Operation Model Environment

14.1 Access Volume Settings

When sending a command to ETERNUS Disk storage system to perform an Advanced Copy function from the CCM Server by using Copy command via SAN, this setting must be performed on each ETERNUS Disk storage system.

When using the Copy command via SAN, a logical volume that can be accessed by the CCM Server must be defined in the ETERNUS Disk storage system, according to "Figure 9.1 Example of System Configuration Using Copy Command via SAN". In this manual, this logical volume is called "access volume". One logical volume of ETERNUS Disk storage system must be assigned to CCM Server as the access volume.

Refer to "Access Volume Settings" in the *AdvancedCopy Manager Operation Guide for Copy Control Module* for information on the procedure.

14.2 Storage Device Registration

The ETERNUS Disk storage system where Advanced Copy operations will be performed with AdvancedCopy Manager CCM must be registered in AdvancedCopy Manager CCM with the following information.

- Name of ETERNUS Disk storage system

- IP address of ETERNUS Disk storage system

- User name and password of users who access the ETERNUS Disk storage system

- Access Volume set in "14.1 Access Volume Settings" (only for using Copy command via SAN)

Refer to "Registering ETERNUS Disk Storage System" in the *AdvancedCopy Manager Operation Guide for Copy Control Module* for information on the procedure.

14.3 Copy Group Creation

Create copy groups.
The combination of the copy source and destination logical volume is called "copy pair". Several copy pairs can be grouped into what is called "copy group".

When creating a copy group, ETERNUS Disk storage system to be used and the type of Advanced Copy must be set. Refer to "Creating Copy Groups" in the *AdvancedCopy Manager Operation Guide for Copy Control Module* for information on the procedure.

14.4 Copy Pair Creation

The copy pairs must be registered in a copy group.
To register a copy pair, the following information is required.

- Name of the copy source ETERNUS Disk storage system

- Logical volume number of the copy source volume

- Name of the copy destination ETERNUS Disk storage system

- Logical volume number of the copy destination volume

Refer to "Adding Copy Pairs" in the *AdvancedCopy Manager Operation Guide for Copy Control Module* for information on the procedure.

14.5   Backing Up Setup Information

AdvancedCopy Manager CCM setting information should be backed up to prevent its loss in case of a failure of the CCM Server.

Refer to "Backing Up Environment Settings Files" in the *AdvancedCopy Manager Operation Guide for Copy Control Module* for information on the procedure.

Chapter 15   Start Operation of Agent-Less Operation Model

This chapter explains how to start the operation of the Agent-less operation model.

15.1   Executing Backup

Perform a backup of the data in the business volume by executing an Advanced Copy.
Refer to "Executing Advanced Copy" in the *AdvancedCopy Manager Operation Guide for Copy Control Module* for information on the procedure.

15.2   Checking Copy Status and Cancelling Operation

When Advanced Copy is running, it is possible to check the copy progress status or cancel the copy operation.
Refer to "Executing Advanced Copy" in the *AdvancedCopy Manager Operation Guide for Copy Control Module* for information on the procedure.