ETERNUS VSS Hardware Provider 2.3

Copy Set Operation Technical Guide

FUJITSU

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Preface

This manual provides a copy set operation overview of ETERNUS VSS Hardware Provider and explains how to use it.

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Intended Audience

This manual is intended for users who use ETERNUS VSS Hardware Provider for copy set operation.
For users who want an overview of the ETERNUS VSS Hardware Provider and who use ETERNUS VSS Hardware Provider for target disk pool operation, refer to the related manuals.

About This Product

This product is designed, developed and manufactured as contemplated for general use, including without limitation, general office use, personal use, household use, and ordinary industrial use, but is not designed, developed and manufactured as contemplated for use accompanying fatal risks or dangers that, unless extremely high safety is secured, could lead directly to death, personal injury, severe physical damage or other loss (hereinafter "High Safety Required Use"), including without limitation, nuclear reaction control in nuclear facility, air craft flight control, air traffic control, mass transport control, medical life support system, missile launch control in weapon system. You shall not use this product without securing the sufficient safety required for the High Safety Required Use. If you wish to use this product for High Safety Required Use, please consult with our sales representatives in charge before such use.

The Structure of this Manual

This manual consists of the following ten chapters.

● Chapter 1   ETERNUS VSS Hardware Provider

● Chapter 2   Workflow

● Chapter 3   Preparation

● Chapter 4   Environment Creation

● Chapter 5   Operation

● Chapter 6   Operation Change

● Chapter 7   Operation End

● Chapter 8   Commands

● Chapter 9   Messages

● Chapter 10   Troubleshooting

Related Manual

The following are related manual:

• ETERNUS VSS Hardware Provider 2.3 User's Guide

Additional Information

Abbreviations

In this manual, the FUJITSU Storage ETERNUS Disk storage systems and the FUJITSU Storage ETERNUS All Flash Array supported by this product are referred to as "storage system". For details about the supported storage systems, refer to the following website:

http://www.fujitsu.com/global/support/products/computing/storage/download/vsshp.html

In this manual, Web GUI and ETERNUSmgr are collectively referred to as "ETERNUS Web GUI".

Symbols Used in This Manual

The following symbol is used throughout this manual.

▷ Caution	This indicates information for the user to note when using the ETERNUS VSS Hardware Provider. Please be sure to read this information.

Naming Conventions

The following names are used for Microsoft® Windows Server®.

Product Names	Referred to in this manual as	
• Microsoft® Windows Server® 2008 Enterprise (x86) Service Pack 2 • Microsoft® Windows Server® 2008 Standard (x86) Service Pack 2	Windows Server 2008 x86	Windows Server or Windows Server 2008
• Microsoft® Windows Server® 2008 Enterprise (x64) Service Pack 2 • Microsoft® Windows Server® 2008 Standard (x64) Service Pack 2	Windows Server 2008 x64	
• Microsoft® Windows Server® 2008 R2 Enterprise • Microsoft® Windows Server® 2008 R2 Standard • Microsoft® Windows Server® 2008 R2 Datacenter	Windows Server 2008 R2	
• Microsoft® Windows Server® 2012 Standard • Microsoft® Windows Server® 2012 Datacenter	Windows Server 2012	Windows Server or Windows Server 2012
• Microsoft® Windows Server® 2012 R2 Standard • Microsoft® Windows Server® 2012 R2 Datacenter	Windows Server 2012 R2	

Notes when deleting the server graphic shell on Windows Server 2012

An environment in which a server graphic shell is deleted can be configured for Windows Server 2012.
Note that in this environment, GUI operations cannot be performed.
For more details, refer to "For a Server Core environment" in "For Windows Server 2012".

Acknowledgments

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Chapter 1
ETERNUS VSS Hardware Provider

1.1 Overview

ETERNUS VSS Hardware Provider (hereinafter referred to as "VSSHP") is a program that is compatible with the Microsoft Volume Shadow Copy Service (hereinafter referred to as "VSS") interface, and that creates shadow copies of volumes in a storage system. Using VSSHP with VSS-compatible backup software or a server application enables you to backup data with VSS without stopping operation.

Refer to "1.1 Overview" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for details.

Refer to the following website for details on VSSHP supported storage systems, copy types, OSs, requesters, and writers:

> http://www.fujitsu.com/global/support/products/computing/storage/download/vsshp.html

1.2 Functions

■ **Cooperation with Advanced Copy functions**

Refer to "1.2 Functions" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for details.
The copy types that VSSHP uses are "QuickOPC" and "SnapOPC+".
For a copy set operation, "OPC" and "SnapOPC" can be used in order to maintain compatibility with the previous version and level.

■ **Operation types and management methods for Shadow Copy destination volumes with VSSHP**

The following two operation types for VSSHP are supported. Which method is used depends on how the volumes for the Shadow Copy destination are managed.

- Target disk pool operation
  The user does not specify the Shadow Copy destination explicitly.
- Copy set operation
  The user specifies the Shadow Copy destination explicitly.

Both of these methods cannot be performed at the same time.

For details about target disk pool operation, refer to "ETERNUS VSS Hardware Provider 2.3 User's Guide".

■ Copy set operation

When a Shadow Copy of the source data is created by VSSHP in cooperation with ETERNUS SF AdvancedCopy Manager, the user needs to use the copy set operation that specifies the volume for the Shadow Copy destination explicitly. In the copy set operation, the user sets the combination of the source disk and a Shadow Copy destination in advance.
Therefore, the backup suitable in the business form can be designed.

Register the copy set information, in which the combination of the source disk and target disk is specified, in the copy set Management file in advance.
When the backup is started from the requester, VSSHP makes the Shadow Copy of the source data according to the copy set information that is registered in the copy set management file.

The following are specified for copy set information.

- Copy type
  OPC and SnapOPC in addition to QuickOPC and SnapOPC+ supported by target disk pool management function is supported.
- Source disk information of backup object
- Shadow Copy destination information

▶ **Caution**

- A target disk pool operation and a copy set operation cannot be performed at the same time.
- Do not register any Shadow Copy destination volumes that are used for target disk pool operation while a copy set operation is being performed. For details on operation modes and management files, refer to "1.3.3 Volume Management Methods and Management Files" in "ETERNUS VSS Hardware Provider 2.3 User's Guide".

1.3   Operational Procedure

1.3.1   Server Configuration

VSSHP supports the following server configurations. These configurations depend on the requester to be used. Check which configuration is supported by the requester and decide the server configuration.

- Configuration using the same Windows Server as both the production server and backup server (hereafter referred to as "Local Copy Configuration")
- Configuration using different Windows Servers for the production server and backup server (hereafter referred to as "Transportable Copy Configuration")

To back up a virtual machine on a host OS in which Hyper-V is installed, refer to "1.3.1.3 Local Copy Configuration (when Backing Up a Hyper-V Virtual Machine)" (page 15) or "1.3.1.4 Transportable Copy Configuration (when Backing Up a Hyper-V Virtual Machine)" (page 15).

For all other cases, refer to "1.3.1.1 Local Copy Configuration" (page 13) or "1.3.1.2 Transportable Copy Configuration" (page 13).

> ▷ **Caution**
>
> For Hyper-V settings, only virtual machines on the host OS are targeted for backing up.

1.3.1.1   Local Copy Configuration

Refer to "1.3.1.1 Local Copy Configuration" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for details.

1.3.1.2   Transportable Copy Configuration

Refer to "1.3.1.2 Transportable Copy Configuration" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for details.

■ Cluster configuration

For copy set operation, note the following point:

- Register the copy set information in a copy set management file in each production server, according to the hard disk configuration of the production server.
  For details on how to register the copy set information in a copy set management file, refer to "4.5 Registering Copy Set Information" (page 33).

Registering the copy set information in a copy set management file in advance enables you to backup work sources for continuation after fail-over.

The following examples show the layout of the copy set information in a configuration with a single active production server and a single standby production server (1:1), and in a configuration with multiple active production servers and a single standby production server (n:1).

- Example of 1:1 case

  Figure 1.1   Transportable Copy configuration (example of a 1:1 standby production server for cluster configurations)
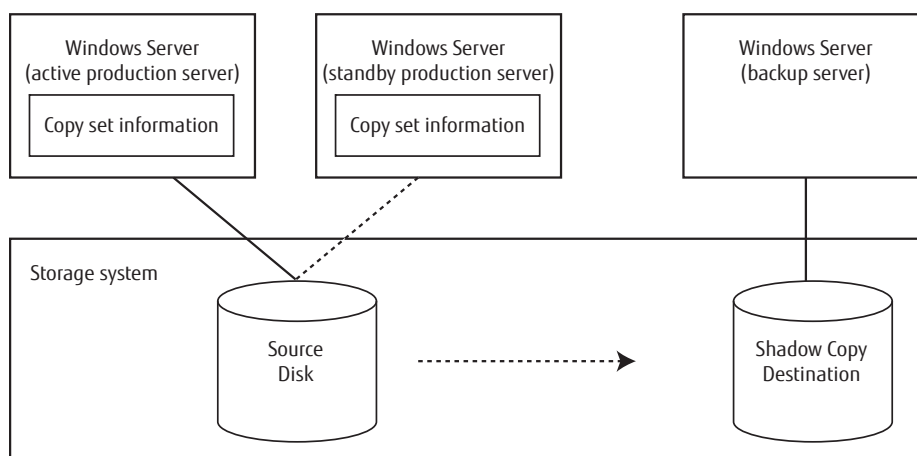
Configure the copy set information of the standby production server to include the copy set information of the active production server.

- Example of n:1 case

  Figure 1.2   Transportable Copy configuration (example of an n:1 standby production server for cluster configurations)

1.3.1.3 Local Copy Configuration (when Backing Up a Hyper-V Virtual Machine)

Refer to "1.3.1.3 Local Copy Configuration (when Backing Up a Hyper-V Virtual Machine)" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for details.

1.3.1.4 Transportable Copy Configuration (when Backing Up a Hyper-V Virtual Machine)

Refer to "1.3.1.4 Transportable Copy Configuration (when Backing Up a Hyper-V Virtual Machine)" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for details.

■ Cluster configuration

The following should note it in case of the copy set operation.

- Register the copy set information in a copy set management file in each production server, according to the hard disk configuration of the production server.
  For details on how to register the copy set information in a copy set management file, refer to "4.5 Registering Copy Set Information" (page 33).

Registering the copy set information in a copy set management file in advance enables you to backup work sources for continuation after fail-over.

The following examples indicate the registration status of the copy set information in a copy set management file, for both a single active production server, single standby production server case (1:1), and for a multiple active production server, single standby production server case (n:1)

- Example of 1:1 case
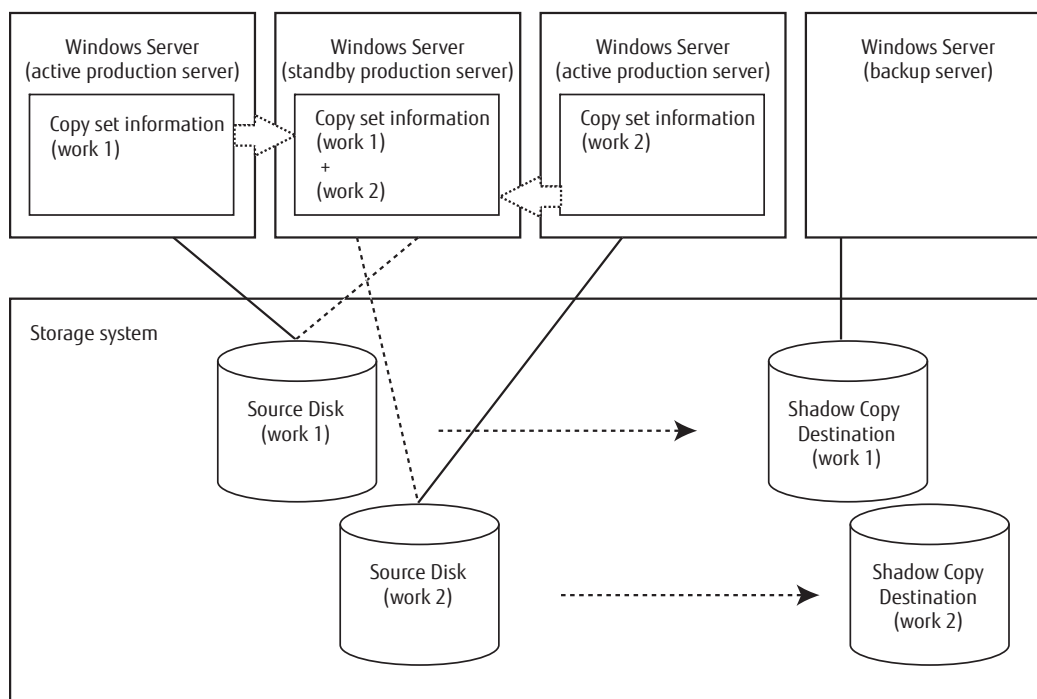
Figure 1.3   Transportable Copy configuration when backing up a Hyper-V virtual machine (example of a 1:1 standby production server for cluster configurations)
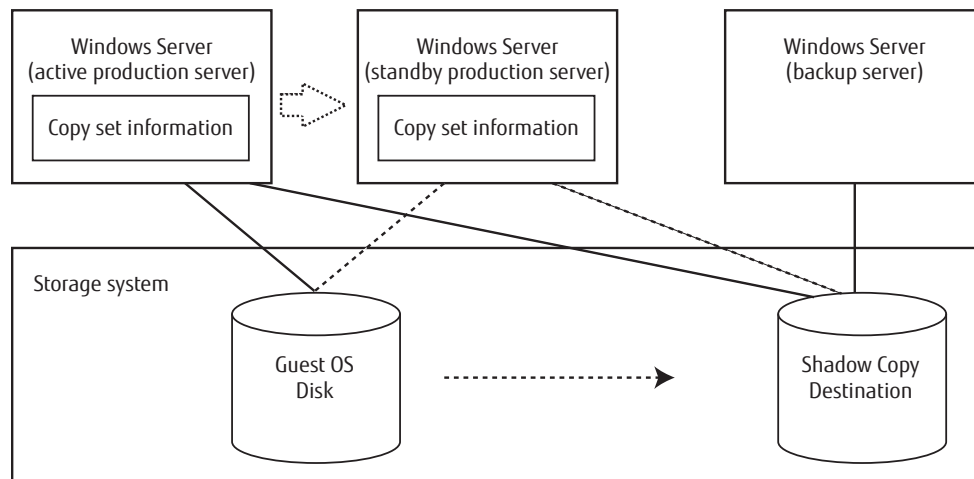
Configure the copy set information of the standby production server to include the copy set information of the active production server.

- Example of n:1 case

Figure 1.4   Transportable Copy configuration when backing up a Hyper-V virtual machine (example of an n:1 standby production server for cluster configurations)
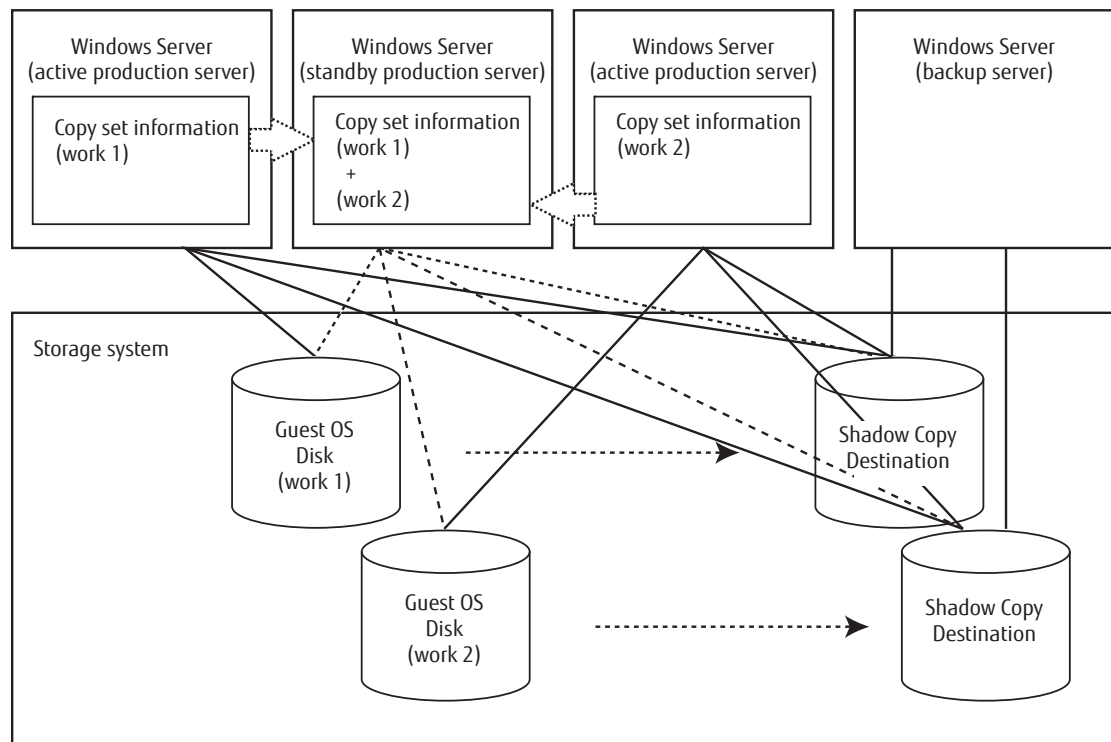
1.3.2   Disk Conditions

Refer to "1.3.2 Disk Conditions" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for the condition of the source disk of the target for the backup.

■ Source disk and Shadow Copy destination combinations

- For an OPC/QuickOPC/SnapOPC operation, the combination of only one Shadow Copy destination and one backup method is supported for one source disk.
- For an OPC/QuickOPC/SnapOPC operation, when a copy set file is registered with the combinations of multiple Shadow Copy destinations and multiple backup methods for one source disk, only the first combination that is described in the copy set file is registered in a copy set management file. Second and later combinations are invalid.
- For a SnapOPC+ operation, a combination of multiple Shadow Copy destinations is supported for one source disk.
  In this case, backup is performed in the order described in the copy set file. Therefore, copy set information for the same source disk should be defined together. The maximum number of backup is one that is supported by SnapOPC+.
- A combination of one Shadow Copy destination and multiple source disks is not supported. If such a copy set file is registered with this combination, an error will occur.

■ Other notes

• When the physical disk number of source disk is changed due to a change of disk configuration on the source server, backup operation using VSSHP is not guaranteed. When changing disk configuration of the source server, make sure to perform the following on the source server.

Procedure

1   Before changing disk configuration, stop the copy session of the source disk to be changed.
When changing disk configuration without stopping the copy session, specify -f option for "Batch Stop Command" to stop all the copy sessions.
For details, refer to .

2   After changing disk configuration, correct the physical disk number for the source disk in the copy set file into the one for the current source disk.
For the procedure on how to create a copy set file, refer to .

3   Register the copy set information again.
For registration of copy set information, refer to .

End of procedure

1.3.3   Volume Management Methods and Management Files

VSSHP creates a management file that supports the management method for a Shadow Copy destination volume.
For more details, refer to "1.3.3 Volume Management Methods and Management Files" in "ETERNUS VSS Hardware Provider 2.3 User's Guide".

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1.4 Supported Environment

Refer to the following website for details on VSSHP supported storage systems, copy types, OSs, requesters, and writers:

  http://www.fujitsu.com/global/support/products/computing/storage/download/vsshp.html

Since the combination of the supported OSs has conditions for interaction between ETERNUS SF AdvancedCopy Manager 13.4.1 and VSSHP, refer to manual of ETERNUS SF AdvancedCopy Manager.

For the Server Core installation option of the OS, Windows Server 2008 R2 or later is supported.

For a transportable copy configuration, the possible combinations (compatibility information) of VSSHP versions that can be used for production servers and backup servers are shown in the following table.

Table 1.1   Possible VSSHP version combinations for production servers and backup servers

VSSHP version of the backup server	VSSHP version of the production server						
	2.0.0	2.0.1	2.0.2	2.1.0	2.1.1	2.2.0	2.3.0
2.0.0	Yes	Yes	No	No	No	No	No
2.0.1	Yes	Yes	No	No	No	No	No
2.0.2	No	No	Yes	No	No	No	No
2.1.0	No	No	No	Yes	No	No	No
2.1.1	No	No	No	No	Yes	No	No
2.2.0	No	No	No	No	No	Yes	No
2.3.0	No	No	No	No	No	No	Yes

Yes: compatible
No: incompatible

For VSSHP 1 or earlier, use the same version and level for production servers and backup servers.

● Caution when an interactive configuration is used for ETERNUS SF AdvancedCopy Manager and VSSHP

  The agent of ETERNUS SF AdvancedCopy Manager must be installed before installing VSSHP.
  When VSSHP is configured with ETERNUS SF AdvancedCopy Manager, only a copy set
  operation is supported for the Shadow Copy. A target disk pool operation is not supported. Note that only a
  transportable configuration is supported.

1.5 Necessary Resources

This section describes the resources to be required during backup operation using VSSHP.

1.5.1 Required Disk Capacity for Installation

Table 1.2   Required disk capacity for installation

No.	Remarks	Capacity	Folder
1	Stores programs.	10MB	Installation folder (*1)

*1:   The default installation folder is as follow.
        System drive:\Program Files\ETERNUS VSS Hardware Provider

1.5.2 Required Disk Capacity for Operation

Table 1.3   Required disk capacity for operation

No.	Remarks	Capacity	Folder
1	Trace log	100MB	Installation folder (*1)
2	The capacity is a total of a copy set file and a copy set management file where a copy set information is registered. (*2)	$(0.1 + (0.2 \times a))/1024$ MB	Installation folder (*1)

a: The number of Shadow Copy destinations

*1:   The default installation folder is as follow.
        System drive:\Program Files\ETERNUS VSS Hardware Provider

*2:   Required for the production server

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Chapter 2

Workflow

Perform preparation, install VSSHP, and setup the environment according to the following workflow.

Figure 2.1   VSSHP installation workflow

Flowchart	References
Register the Advanced Copy license	"3.1 Advanced Copy License Registration" (page 21)
Decide server configuration	"1.3.1 Server Configuration" (page 13)
Install VSSHP in a backup server / Change the firewall setting of the backup server	"4.1.1.1 Backup Server" (page 23)
Install VSSHP in a production server	"4.1.1.2 Production Server" (page 23)
Install VSSHP	"4.1.2 Local Copy Configuration Installation" (page 24)
Decide the disk type for Shadow copy destination	"4.3.1 Selection of the Shadow Copy Destination Disk Type" (page 28)
Measure the amount of updates	"4.3.2 Shadow Copy Destination Disk Capacity Estimation" (page 29)
Create a volume (Standard volume) / Create a volume (SDV, TPV, or FTV)	"4.3.3 Volume Creation" (page 31)
Creating/Registering copy set information	"4.4 Creating a Copy Set File" (page 31) / "4.5 Registering Copy Set Information" (page 33)
Start backup operation	"Chapter 5 Operation" (page 34)

☐ : Operation on the storage system   ☐ : Operation on the server

Chapter 3
Preparation

3.1 Advanced Copy License Registration

Refer to "3.1 Advanced Copy License Registration" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for the registration of the Advanced Copy license.

Chapter 4

Environment Creation

VSSHP supports the following installation methods.

-
-

If the "User Account Control" screen appears while performing installation or uninstallation, select [Accept] to continue the process.

Operate as follows after installation.

-
-
-

4.1　New Installation

Two types of VSSHP packages are provided. Refer to the following table to determine which package corresponds to the OS being used, and then download and install this package.

Table 4.1　VSSHP download file for each supported OS

Supported OS	Download file name (*1)
Windows Server 2008 x86	vsshp_x_x_x_32bit.zip
Windows Server 2008 x64	vsshp_x_x_x_64bit.zip
Windows Server 2008 R2	
Windows Server 2012	
Windows Server 2012 R2	

*1:　The "x_x_x" in the file name depends on the version number of the product.

> ▶ **Caution**

Do not install VSSHP in a LUN used for backup operation such as a source disk and a Shadow Copy destination.

4.1.1　Transportable Copy Configuration Installation

Install VSSHP and configuration settings for the backup server first, then for the production server.

4.1.1.1　Backup Server

Refer to "4.1.1.1 Backup Server" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for the installation procedure.
After the setup process of the communication service (ETERNUS VSS Hardware Provider Communication Server service) is completed, the following window is displayed. Click the [CANCEL] button.

- When the agent of ETERNUS SF AdvancedCopy Manager is installed
  The following window is not displayed.
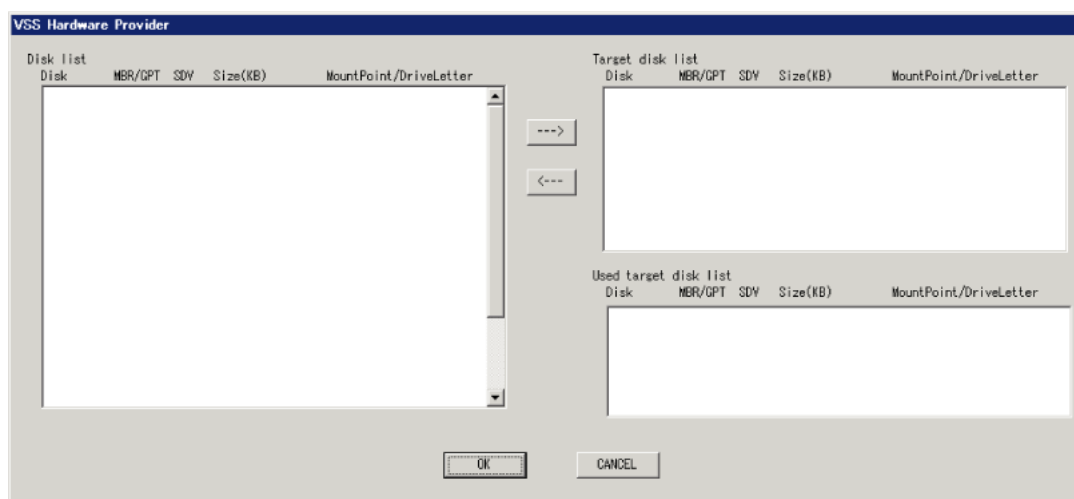
For copy set operation, do not register a target disk pool management file.

> ▷ **Caution**

After the installation, in order to enable communication with the backup server, configure the firewall using the port number that was checked during the installation.
The port number can also be checked after the installation. For details, refer to "8.10 Communication Environment Setup Command (stxvsetcommu)" (page 49).

4.1.1.2　Production Server

Refer to "4.1.1.2 Production Server" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for the installation procedure.

4.1.2   Local Copy Configuration Installation

Refer to "4.1.2 Local Copy Configuration Installation" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for the installation procedure.

After the environmental setting is completed, the following window is displayed. Click the [CANCEL] button.

- When the agent of ETERNUS SF AdvancedCopy Manager is installed
  The following window is not displayed.
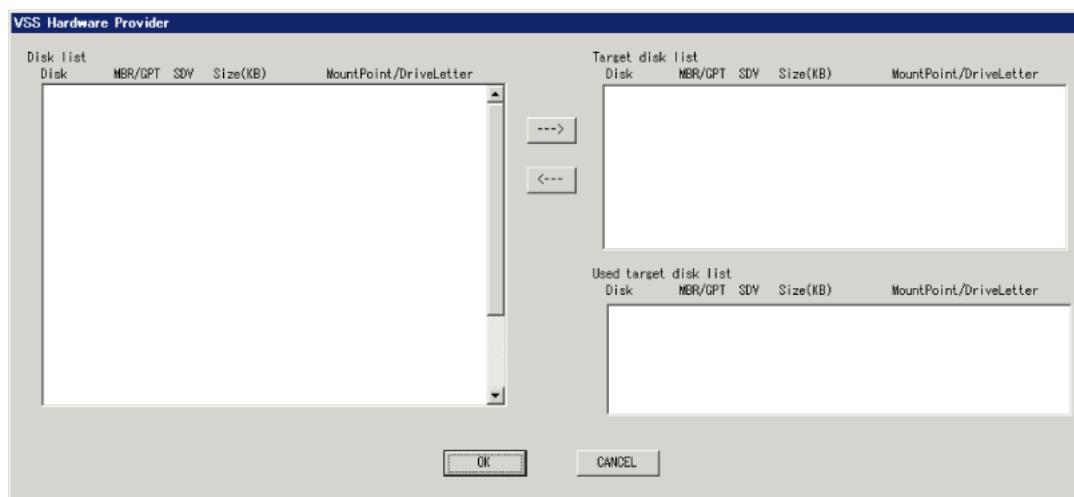
For copy set operation, do not register a target disk pool management file.

4.2　Upgrade Installation

Perform installation according the following procedure.
The environment before upgrade is used. However, if the environment settings screen appears, perform the appropriate environment settings.

▷　**Caution**

Only VSSHP1.1.0 does not support Upgrade Installation.
After uninstalling VSSHP1.1.0, newly install this product.

■　For the backup server of the transportable copy configuration

Procedure

1　Extract the file downloaded in "4.1 New Installation" (page 22).

2　Double-click the VSSHP package (setup.exe) that was extracted to start the wizard. Proceed with the installation according to the wizard. For a Server Core environment, use the command prompt to execute setup.exe.

3 The following window appears. Click the [Skip] button.
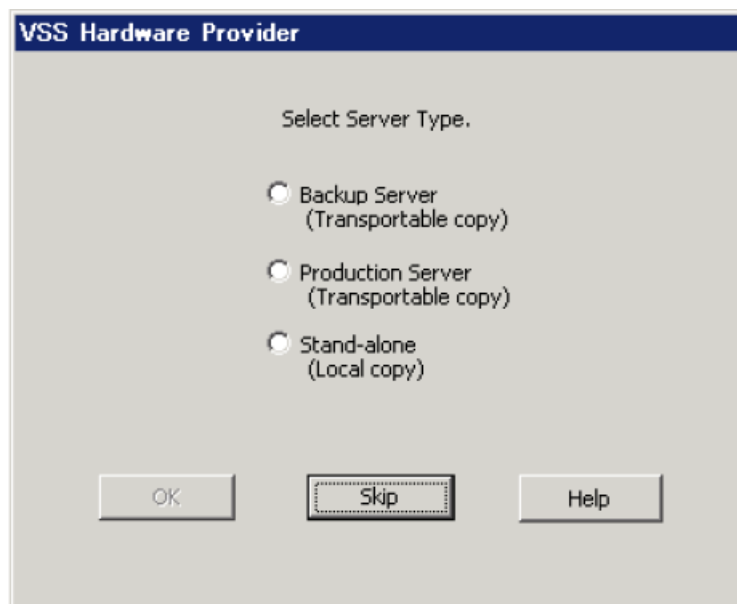
4 Click the [Finish] button on the "InstallShield Wizard Completed" screen to finish the
installation.

End of procedure

■ **For the production server of the transportable copy configuration**

Procedure

1   Extract the file downloaded in "4.1 New Installation" (page 22).

2   Double-click the VSSHP package (setup.exe) that was extracted to start the wizard. Proceed with the installation according to the wizard. For a Server Core environment, use the command prompt to execute setup.exe.

3   Click the [Finish] button on the "InstallShield Wizard Completed" screen to finish the installation.

End of procedure

■ **For the local copy configuration**

Refer to "For the backup server of the transportable copy configuration" (page 25).

4.3　Shadow Copy Destination Disk Creation

When the requester starts backup, VSSHP executes the backup as it is a combination of the Shadow Copy destination with the source disk of copy set information registered in the copy set management file.
Therefore, a Shadow Copy destination disk must be created before copy set information registration.

The following sections explain the types of disks to be used for Shadow Copy destinations that are supported by VSSHP, and the procedure for estimating disk capacity.

4.3.1　Selection of the Shadow Copy Destination Disk Type

Standard volumes, Snap Data Volumes (SDV), Thin Provisioning Volumes (TPV), or Flexible Tier Volumes (FTV) can be used as the Shadow Copy destination. The following table shows the features of each volume type. Choose a disk type according to your requirements.

Table 4.2　Features of the Shadow Copy destination disks

Disk type	Copy type	Operation conditions	Features
Standard volume	OPC or QuickOPC	–	• Suitable for backup of big databases and file servers with a large amount of updates. • A Shadow Copy destination must have the same capacity as a source disk. • Backup can be performed regardless of the amount of updates.
SDV	SnapOPC or SnapOPC+	–	• Suitable for backup of databases and file servers with only a small amount of updates. • Can operate with a capacity of the Shadow Copy destination that is lower than that of the source disk. • When the amount of updates exceeds the SDV capacity, access to the Shadow Copy destination is lost. The required SDV capacity should be measured in advance.

Disk type	Copy type	Operation conditions	Features
TPV or FTV	OPC or QuickOPC	–	• Suitable for backup of big databases and file servers with a large amount of updates. • A Shadow Copy destination must have the same capacity as a source disk. • Backup can be performed regardless of the amount of updates.
	SnapOPC or SnapOPC+	• ETERNUS VSS Hardware Provider 2.3.0 or later • ETERNUS DX S3 series with firmware version V10L60 or later	• Suitable for backup of databases and file servers with only a small amount of updates. • Can operate with a capacity of the Shadow Copy destination that is lower than that of the source disk. • Volumes must be created after the update amount is estimated to avoid a shortage of the TPP capacity or the FTRP capacity.

4.3.2   Shadow Copy Destination Disk Capacity Estimation

The disk capacity of the Shadow Copy destination volume to be created varies depending on the selected copy type.

- For QuickOPC
  The Shadow Copy destination disk capacity must be the same as that of the source disk.

- For SnapOPC+
  The Shadow Copy destination disk capacity can be lower than that of the source disk.
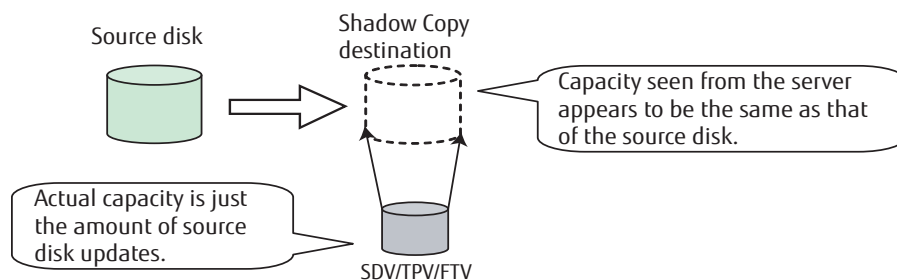
SDV disk capacity (*1) is calculated by the amount of the source disk updates for the period when the requester is using the Shadow Copy destination (*2).
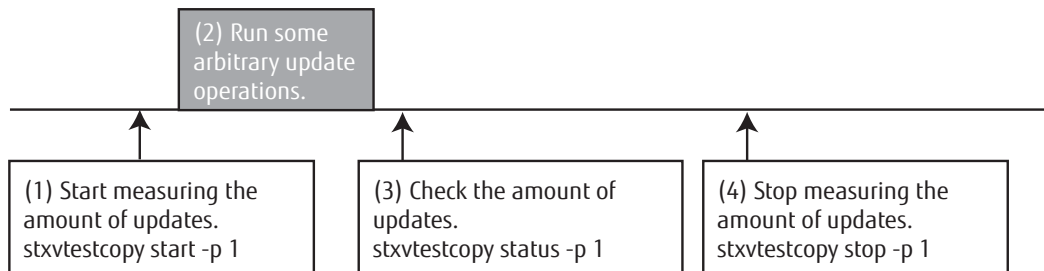The disk space that is used by TPVs/FTVs is calculated by the amount of the source disk updates for the period when the requester is using the Shadow Copy destination.

- *1:   For details about SDVs and SDPVs, refer to "Design Guide (Basic)" of the storage system model.
- *2:   For example, the period is the time from when the requester starts backup to when backup to a tape device finishes.

Measure the amount of the source disk updates using the "Update Volume Measurement Command (stxvtestcopy)". Use the following procedure and determine the disk capacity for SDVs.

```
                          (2) Run some
                          arbitrary update
                          operations.

  (1) Start measuring the     (3) Check the amount of    (4) Stop measuring the
  amount of updates.          updates.                   amount of updates.
  stxvtestcopy start -p 1     stxvtestcopy status -p 1   stxvtestcopy stop -p 1
```

Procedure

1 Start measuring the amount of updates for the target source disk. (start option)

```
C:\>"C:\Program Files\ETERNUS VSS Hardware Provider\bin\stxvtestcopy"
start -p 1
stxvtestcopy successfully completed.
```

2 Measure the typical amount of source disk updates.

To discover the typical amount of source disk updates, run some arbitrary update operations.
For example, to estimate the required capacity for backing up a whole day of updates, execute a typical days worth of update operations.

3 After the arbitrary update operations have completed, check the amount of source disk updates. (status option)

```
C:\>"C:\Program Files\ETERNUS VSS Hardware Provider\bin\stxvtestcopy"
status -p 1
source-disk  update
1            2
stxvtestcopy successfully completed.
```

4 After checking the amount of updates, stop measuring the amount of updates. (stop option)

```
C:\>"C:\Program Files\ETERNUS VSS Hardware Provider\bin\stxvtestcopy"
stop -p 1
stxvtestcopy successfully completed.
```

5 Estimate the SDV physical capacity.

According to the measured amount of updates, estimate the SDV physical capacity.
The physical capacity of the SDV that was verified from the result in Step 3 is 2MB.

End of procedure

For the details about the "Update Volume Measurement Command", refer to "8.2 Update Volume Measurement Command (stxvtestcopy)" (page 38).

4.3.3　Volume Creation

Refer to "3.2.3 Volume Creation" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for details.

4.4　Creating a Copy Set File

The Shadow Copy destination cannot be specified by a requester or VSS, but by a VSSHP. Therefore, the copy set information must be registered in the copy set management file. This is only required for copy set operation.

To register copy set information, a copy set file, which describes copy set information, must be created in the production server.
Create a copy set file in text format by using a text editor such as Notepad.

■ File name

```
"Installation folder"\var\vss\copyset.txt
```

It is possible to create the file with an arbitrary name in an arbitrary folder.
In this case, specify the -file option for the "Copy Set File Registration Command" to be used when registering copy set information.

■ Format

- Local copy configuration format (Format 1)

```
type,[option],source-disk,target-disk
```

- Transportable configuration format (Format 2)

```
type,[option],source-disk,target-olu,target-boxid
```

> **Caution**

- Enter each item using [,] (comma) as a delimiter.
- Enter input items starting from the first column.
- The number of characters in a line is limited to 200 bytes.
- If [#] is entered in the first column, it is a comment line.
- A blank line is a comment line.
- For the combination of source disk and Shadow Copy destination, refer to "1.3.2 Disk Conditions" (page 16).
- To specify a Box ID that contains blanks, use double quotation marks to describe the Box ID.

■ **Description of input items**

Input items	Description
type	Specify a copy type. • OPC : OPC • QOPC : QuickOPC • SOPC : SnapOPC • SOPCP : SnapOPC+
option	Do not specify this item because it is reserved for future enhancements.
source-disk	Specify a source disk using either of the following methods. • Specify the physical disk number as a decimal number limit of nine digits. (*1) • Specify the mount point (*2)
target-disk	Specify a Shadow Copy destination using either of the following methods. • Specify the physical disk number as a decimal number limit of nine digits. (*1) • Specify the mount point (*2)
target-olu	Specify the OLU number of the Shadow Copy destination. (*3) The OLU number means the Logical Volume number. Specify it as a hexadecimal number of four digits by inputting "0x" in front of the hexadecimal number. When the OLU number is 1, specify it as "0x0001".
target-boxid	Specify the Box ID of the Shadow Copy destination. (*3)

*1:   Obtain the physical disk number according to the following procedure.
    1. Start "Computer Management".
       Click the [Start] – [Control Panel], then double-click [Administrative Tools], then [Computer Management] to start.
    2. Obtain the physical disk number of the Shadow Copy destination.
       Click [Computer Management (local)] – [Storage] – [Disk Management].
       The disk number of the target volume is the physical disk number.

*2:   Specify the mount point using its complete path or drive letter.

*3:   Obtain the OLU number and Box ID of the Shadow Copy destination by executing "OLU Number Display Command" in the backup server.
       For details, refer to .

■ **Input example**

```
Local Copy Configuration example
OPC,,1,21
QOPC,,c:\mountpoint\,23
SOPCP,,6,11
SOPCP,,6,12

Transportable Copy Configuration example
QOPC,,7,0x001d,00E4000M600###E360S20A####GA000077######
SOPC,,8,0x001d,00E4000M600###E360S20A####GA000077######
```

4.5   Registering Copy Set Information

Use the "Copy Set File Registration Command" to register the copy set information file created in the copy set management file.
For details, refer to "8.3 Copy Set File Registration Command (stxvcopyset)" (page 39).
After registering the copy set information in the copy set management file, it is recommended to save the created copy set file. Re-register the copy set information using the saved copy set file.

Chapter 5
Operation

Refer to "Chapter 5 Operation" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for backup operation procedures using VSSHP.

Chapter 6

Operation Change

6.1 When Changing the Copy Set Information

In the following cases, change the copy set file, and re-register the copy set information.
This operation is required only for a copy set operation.

- Adding a copy set information
- Deleting a copy set information
- Changing a combination of a source disk and Shadow Copy destination
- Changing a physical disk number or mount point of a source disk
- Changing a physical disk number or mount point of a Shadow Copy destination
- Changing a copy type

For details on how to create a copy set file, refer to "4.4 Creating a Copy Set File" (page 31).

For registering a copy set information, refer to "4.5 Registering Copy Set Information" (page 33).

6.2 When Changing the Communication Environment

Refer to "6.2 When Changing the Communication Environment" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for details.

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Chapter 7
Operation End

Refer to "Chapter 7 Operation End" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for operation end.

Chapter 8
Commands

This chapter explains how to use each command.

Table 8.1   Command usage

Command name	Function	Production server	Backup server
Provider Registration/Deletion Command (stxvprovider)	Registers or deletes VSSHP in VSS	usable	usable
Update Volume Measurement Command (stxvtestcopy)	For SnapOPC+ operation, measures the cumulative amount of source disk updates	usable	unusable
Copy Set File Registration Command (stxvcopyset)	Registers copy set information of a created copy set file in a copy set management file	usable	unusable
Copy Set Registration Display Command (stxvcopyprt)	Displays copy set information that is registered in a copy set management file	usable	unusable
Backup Control Command (stxvcopy)	Stops a copy session of the specified source disk	usable	unusable
Batch Stop Command (stxvstopall)	Stops a copy session of the source disk that is registered in a copy set management file	usable	unusable
Backup Status Query Command (stxvquery)	Displays Advanced Copy status of the specified source disk	usable	unusable
OLU Number Display Command (stxvgetolu)	Displays information such as the OLU number and Box ID of the specified storage systems	usable	usable
Communication Environment Check Command (stxvchkcommu)	Checks whether the communication environment between the production server and backup server is correct	usable	unusable
Communication Environment Setup Command (stxvsetcommu)	Sets the VSSHP communication environment in a Server Core environment	usable	usable
Hyper-V Environment Setup Command (stxvhyperv)	Sets the Hyper-V transportable copy operation	usable	unusable
Shadow Copy Destination Recovery Command (stxvrecoverydisk)	Recovers Shadow Copy destination disks that are invisible from the server due to VSSHP.	usable (*1)	usable

*1: Used only for a transportable copy configuration (when backing up a Hyper-V virtual machine)

Commands must be executed by users who belong to the Administrators group.
The following table shows notation used for explaining commands.

Table 8.2   Command notation

Notation	Description
|	One of multiple options is specified.
[ ]	Arbitrarily-specified item
_	Omitted value
Italic	Variable part

8.1　Provider Registration/Deletion Command (stxvprovider)

This command registers or deletes VSSHP in VSS.
Refer to "8.1 Provider Registration/Deletion Command (stxvprovider)" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for details.

8.2　Update Volume Measurement Command (stxvtestcopy)

For a SnapOPC/SnapOPC+ operation, this command keeps a cumulative total of the amount of source disk updates that have occurred for the specified physical disk or mount point.
Refer to "8.2 Update Volume Measurement Command (stxvtestcopy)" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for details.

> **▷ Caution**
>
> The source disk used by the cumulative total of the amount need not be defined in the copy set file.

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8.3   Copy Set File Registration Command (stxvcopyset)

This command registers the copy set information for copy set files that are created by the user in copy set management files.
Execute this command on a production server.

■ Format

```
"Installation folder"\bin\stxvcopyset [-c | -r] [-file file-name]
```

■ Description of options

Option	Description
-c	Performs only a copy set file check (specified by default).
-r	Performs checking a copy set file and registers the copy set information in a copy set management file.
-file	When creating a copy set file in an arbitrary folder, specify the copy set name as a full path name. When creating a copy set file using the following file name, this option can be omitted. • "Installation folder"\var\vss\copyset.txt

■ Description of operand

Operand	Description
file-name	Specifies a copy set file name as a full path name.

■ Execution example

● For checking (with error)

```
C:\>"C:\Program Files\ETERNUS VSS Hardware Provider\bin\stxvcopyset" -c
STXV0205 ERROR Line[3] Invalid number of items.
STXV0208 ERROR Line[5] Unnecessary copy options are specified.
STXV0227 INFO Number of errors: [2]
stxvcopyset check completed.

C:\>
```

● For checking (without error)

```
C:\>"C:\Program Files\ETERNUS VSS Hardware Provider\bin\stxvcopyset" -c
stxvcopyset check completed.

C:\>
```

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● For registration (with error)

```
C:\>"C:\Program Files\ETERNUS VSS Hardware Provider\bin\stxvcopyset" -r -file
C:\work\copyset.txt
STXV0208 ERROR Line[5] Unnecessary copy options are specified.
STXV0227 INFO Number of errors: [1]
STXV0229 INFO [10] copy set information is registered.
stxvcopyset registration succeeded.

C:\>
```

● For registration (without error)

```
C:\>"C:\Program Files\ETERNUS VSS Hardware Provider\bin\stxvcopyset" -r -file
C:\work\copyset.txt
STXV0229 INFO [5] copy set information is registered.
stxvcopyset registration succeeded.

C:\>
```

▷ Caution

- Do not execute this command during backup from a requester.
- The contents described in a copy set file become enabled when this command is executed with the -r option, and the contents are registered in a copy set management file.
- If there is an error within the contents of a copy set file, the copy set information in the failed line will not be registered in the copy set management file, even if this command is executed with the -r option.
- If all contents described in a copy set file are in error, the copy set management file is not updated, even if this command is executed with the -r option.
- If this command tries to update the running copy set information, the copy set management file is not updated, even if this command is executed with the -r option.
- To specify a Box ID that contains blanks, use double quotation marks to describe the Box ID for the copy set file.

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■ **Reference**

● Identifying if a command ends normally

An error has occurred if a message includes one of the following error levels:

"ERROR"
"WARNING"

● Notes on identifying whether a command ends normally

If the -r option is specified with this command and registration of the copy set information is performed, this information is not registered if errors are detected in some of the copy set information and "ERROR" is displayed. Note that the copy set information is registered when no more errors are detected in the rest of the copy set information because the registration process continues with the information that is added after the detected errors. Only the correct copy set information in the copy set file that can be used for an operation is registered. To make sure that information is registered correctly, performing confirmation with the -c option in advance is recommended.

Examples of the parts of copy set information that are available for operation

	Copy set information (Description)	Check result	Registration result
1	OPC,,1,5	Correct	Registered as OPC,,1,5
2	QOPC,,2,	Error	Not registered ("ERROR" detected)
3	SOPC,,3	Error	Not registered ("ERROR" detected)
4	SOPCP,,4,8	Correct	Registered as SOPCP,,4,8

Description of registration result:
All the information of 1, 2, 3, and 4 is processed.
The information of 1 and 4 is registered normally because the information is correct.
The information of 2 and 3 are not registered because errors were detected in this information. "ERROR" is displayed.

8.4 Copy Set Registration Information Display Command (stxvcopyprt)

This command outputs the copy set information that is registered in a copy set management file to standard output.
Execute this command on a production server.

■ Format

"Installation folder"\bin\stxvcopyprt [*source-disk*]

■ Description of operand

Operand	Description
source-disk	Specifies the physical disk number of the source disk to be displayed. (*1) If omitted, all copy set information that is registered in a copy set management file is displayed.

*1: Obtain the physical disk number according to the following procedure.
1. Start "Computer Management".
Click the [Start] – [Control Panel], then double-click [Administrative Tools], then [Computer Management] to start.
2. Obtain the physical disk number of the target disk.
Click [Computer Management (local)] – [Storage] – [Disk Management].
The disk number of the target volume is the physical disk number.

■ Execution example

```
C:\>"C:\Program Files\ETERNUS VSS Hardware Provider\bin\stxvcopyprt"
type,option,source-disk,source-box-id,source-olu-no,target-disk,target-box-id,tar-
get-olu-no
--------------------------------------------------------------------------------
---------
OPC,,1,00E4000M3#####E430S20AU###MP4020738001##,0x000b,21,00E4000M3#####E430S20AU#
##MP4020738001##,0x001f
QOPC,,5,00E4000M3#####E430S20AU###MP4020738001##,0x000f,23,00E4000M3#####E430S20AU
###MP4020738001##,0x0021
SOPCP,,6,00E4000M3#####E430S20AU###MP4020738001##,0x0010,11,00E4000M3#####E430S20A
U###MP4020738001##,0x0015
SOPCP,,6,00E4000M3#####E430S20AU###MP4020738001##,0x0010,12,00E4000M3#####E430S20A
U###MP4020738001##,0x0016
QOPC,,7,00E4000M3#####E430S20AU###MP4020738001##,0x0007,,00E4000M3#####E430S20AU##
#MQ5020739011##,0x001d
SOPCP,,8,00E4000M3#####E430S20AU###MP4020738001##,0x0018,27,00E4000M3#####E430S20A
U###MP4020738001##,0x0026
Registration date : 2007/12/20 12:00:00
Number of registered copy set information : 6
stxvcopyprt successfully completed.

C:\>
```

■ **Displayed contents**

Title	Description
type	Copy type is displayed.
option	Option is displayed.
source-disk	The physical disk number of the source disk is displayed.
source-box-id	The Box ID of the source disk is displayed.
source-olu-no	The OLU number of the source disk is displayed. A hexadecimal number of four digits is displayed with "0x" in front of the hexadecimal number. When the OLU number is 1, it is displayed as "0x0001".
target-disk	The physical disk number of the Shadow Copy destination is displayed. If Shadow Copy destination is not set, nothing is displayed.
target-box-id	The Box ID of the Shadow Copy destination is displayed.
target-olu-no	The OLU number of the Shadow Copy destination is displayed. A hexadecimal number of four digits is displayed with "0x" in front of the hexadecimal number. When the OLU number is 1, it is displayed as "0x0001".

■ **Reference**

● Identifying if a command ends normally

An error has occurred if the following messages are displayed:

"ERROR"
"WARNING"

8.5   Backup Control Command (stxvcopy)

This command stops the copy session of the specified source disk.
Execute this command on a production server.

■ Format

```
"Installation folder"\bin\stxvcopy source-disk | mount-point stop [-f] [-a]
```

■ Description of options

Option	Description
stop	Stops a OPC/QuickOPC/SnapOPC/SnapOPC+ session.
-f	Stops a copy session forcibly.
-a	This option is enabled only for a SnapOPC+ operation. Stops all generations. However, only valid generations are targets. If this command is executed without this option, only the oldest generation is stopped.

■ Description of operand

Operand	Description
source-disk	Specify the physical disk number of the source disk. (*1)
mount-point	Specifies the mount point of the source disk. (*2)

*1:   Obtain the physical disk number according to the following procedure.
    1. Start "Computer Management".
        Click the [Start] – [Control Panel], then double-click [Administrative Tools], then [Computer Management] to start.
    2. Obtain the physical disk number of the target disk.
        Click [Computer Management (local)] – [Storage] – [Disk Management].
        The disk number of the target volume is the physical disk number.

*2:   Specify the mount point using its complete path or drive letter

■ Execution example

```
C:\>"C:\Program Files\ETERNUS VSS Hardware Provider\bin\stxvcopy" 1 stop
STXV0317 INFO Copy session was stopped. Source-Disk = 1 Source-BoxID =
00E4000M3#####E430S20AU###MP4020738001## Source-OLU = 0x000b Target-BoxID =
00E4000M3#####E430S20AU###MP4020738001## Target-OLU = 0x001f
stxvcopy successfully completed.

C:\>
```

▷ **Caution**

- Only a copy session of the specified source disk can be stopped.
- When this command is executed with the -f option for the QuickOPC stop process, the copy session is stopped without waiting for the differential copy to be finished.
- If this command is executed without the -f option for the QuickOPC stop process when a differential copy is running, the copy session is stopped after the differential copy is finished
- If a hardware error occurs in the storage system, this command is not executed.

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8.6 Batch Stop Command (stxvstopall)

This command stops copy sessions including sessions suspended by an error, for all source disks that are registered in a copy set management file.
Execute this command on a production server.

■ Format

```
"Installation folder"\bin\stxvstopall -f | -e
```

■ Description of options

Option	Description
-f	Stops all copy sessions including sessions suspended by an error.
-e	Stops only sessions suspended by an error.

■ Execution example

```
C:\>"C:\Program Files\ETERNUS VSS Hardware Provider\bin\stxvstopall" -f

STXV0412 INFO Copy session was stopped. Source-Disk = 1, Source-BoxID =
00E4000M3#####E430S20AU###MP4020738001##, Source-OLU = 0x000b, Target-BoxID =
00E4000M3#####E430S20AU###MP4020738001##, Target-OLU = 0x001f
STXV0412 INFO Copy session was stopped. Source-Disk = 5, Source-BoxID =
00E4000M3#####E430S20AU###MP4020738001##, Source-OLU = 0x000f, Target-BoxID =
00E4000M3#####E430S20AU###MP4020738001##, Target-OLU = 0x0021
STXV0412 INFO Copy session was stopped. Source-Disk = 6, Source-BoxID =
00E4000M3#####E430S20AU###MP4020738001##, Source-OLU = 0x0010, Target-BoxID =
00E4000M3#####E430S20AU###MP4020738001##, Target-OLU = 0x0015
STXV0412 INFO Copy session was stopped. Source-Disk = 6, Source-BoxID =
00E4000M3#####E430S20AU###MP4020738001##, Source-OLU = 0x0010, Target-BoxID =
00E4000M3#####E430S20AU###MP4020738001##, Target-OLU = 0x0016
STXV0412 INFO Copy session was stopped. Source-Disk = 7, Source-BoxID =
00E4000M3#####E430S20AU###MP4020738001##, Source-OLU = 0x0007, Target-BoxID =
00E4000M3#####E430S20AU###MQ5020739011##, Target-OLU = 0x001d
STXV0412 INFO Copy session was stopped. Source-Disk = 8, Source-BoxID =
00E4000M3#####E430S20AU###MP4020738001##, Source-OLU = 0x0018, Target-BoxID =
00E4000M3#####E430S20AU###MP4020738001##, Target-OLU = 0x0026
stxvstopall 6 copy sessions were stopped.
stxvstopall successfully completed.

C:\>
```

▶ Caution

- Only copy sessions of a source disk that is registered in the copy set management file can be stopped.
- When the -f option is specified for a SnapOPC+ operation, this command stops all valid generations.
- When the -e option is specified for a SnapOPC+ operation, this command stops all valid generations if there is at least one generation that is being suspended by an error.

8.7 Backup Status Query Command (stxvquery)

This command displays the Advanced Copy status for the specified source disk.
Execute this command on a production server.

■ Format

```
"Installation folder"\bin\stxvquery [source-disk | mount-point]
```

■ Description of operand

Operand	Description
source-disk	Specifies the physical disk number of the source disk to be displayed. (*1) If omitted, the status all copy sets for existing sessions registered in the copy set management file are shown.
mount-point	Specifies the mount point of the source disk to be displayed. (*2) If omitted, the status all copy sets for existing sessions registered in the copy set management file are shown.

*1: Obtain the physical disk number according to the following procedure.
    1. Start "Computer Management".
       Click the [Start] – [Control Panel], then double-click [Administrative Tools], then [Computer Management] to start.
    2. Obtain the physical disk number of the Shadow Copy destination.
       Click [Computer Management (local)] – [Storage] – [Disk Management].
       The disk number of the target volume is the physical disk number.

*2: Specify the mount point using its complete path or drive letter.

■ Execution example

```
C:\>"C:\Program Files\ETERNUS VSS Hardware Provider\bin\stxvquery" 1
id,elapsed-time,kind,source-box-id,source-olu-no,target-box-id,target-olu-no,sta-
tus,phase,execute,update,genaration,transfer,recovery
--------------------------------------------------------------------------------
--------------------------------------------------
0x0007,120,QOPC,00E4000M3#####E430S20AU###MP4020738001##,0x0007,00E4000M3#####E430
S20AU###MQ5020739011##,0x001d,executing,copying,8%,---,---,---,---
stxvquery successfully completed.

C:\>
```

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■ **Displayed contents**

Title	Description
id	The session ID of the chassis is displayed. A hexadecimal number of four digits is displayed with "0x" in front of the hexadecimal number. When the OLU number is 1, it is displayed as "0x0001".
elapsed-time	The elapsed time from the beginning of the copy is displayed. (unit: second)
kind	The copy type is displayed. OPC: OPC QOPC: QuickOPC SOPC: SnapOPC SOPCP: SnapOPC+
source-box-id	The Box ID of the source disk is displayed.
source-olu-no	The OLU number of the source disk is displayed. A hexadecimal number of four digits is displayed with "0x" in front of the hexadecimal number. When the OLU number is 1, it is displayed as "0x0001".
target-box-id	The Box ID of the Shadow Copy destination is displayed.
target-olu-no	The OLU number of the Shadow Copy destination is displayed. A hexadecimal number of four digits is displayed with "0x" in front of the hexadecimal number. When the OLU number is 1, it is displayed as "0x0001".
status	The session status is displayed. executing: operating normally errsuspend: suspended by an error halt: suspended in the hardware
phase	The copy status is displayed. copying: copying tracking: tracking (the copy process has completed) trackingcopying: tracking (the copy is being processed) ---: suspended by an error, suspended in the hardware
execute	The copy progress is displayed. nnn%: displayed in percentage ---: other than being copied
update	The update rate is displayed. nnn%: While tracking (the copy process is complete) in QuickOPC operation, this item is displayed in percentage ---: except while tracking (the copy process is complete) in QuickOPC operation
generation	For a SnapOPC+, the generation is displayed. 1 to n: the number of generations ---: operation other than SnapOPC+
transfer	The transfer mode type is displayed. This is not used for OPC/QuickOPC/SnapOPC/SnapOPC+ operation. ---: OPC/QuickOPC/SnapOPC/SnapOPC+
recovery	The setting information of the Recovery mode is displayed. This is not used for OPC/QuickOPC/SnapOPC/SnapOPC+ operation. ---: OPC/QuickOPC/SnapOPC/SnapOPC+

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8.8 OLU Number Display Command (stxvgetolu)

This command displays information such as the OLU number and Box ID of the specified storage systems.
Refer to "8.6 OLU Number Display Command (stxvgetolu)" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for details.

8.9 Communication Environment Check Command (stxvchkcommu)

This command checks whether the communication environment between the production server and backup server is correct.
Refer to "8.7 Communication Environment Check Command (stxvchkcommu)" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for details.

8.10 Communication Environment Setup Command (stxvsetcommu)

This command sets the VSSHP communication environment.
Refer to "8.8 Communication Environment Setup Command (stxvsetcommu)" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for details.

8.11 Hyper-V Environment Setup Command (stxvhyperv)

This command sets the environment of the VSSHP Hyper-V.
Refer to "8.10 Hyper-V Environment Setup Command (stxvhyperv)" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for details.

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8.12   Shadow Copy Destination Recovery Command (stxvrecoverydisk)

If a backup ends abnormally, the Shadow Copy destination disk may not be able to be checked via [Disk Management] in the OS, resulting in the backup process being stopped. If this is the case, use this command to make the Shadow Copy destination disk checkable via [Disk Management].
For more details, refer to "8.11 Shadow Copy Destination Recovery Command (stxvrecoverydisk)" in "ETERNUS VSS Hardware Provider 2.3 User's Guide".

Chapter 9
Messages

Refer to "Chapter 9 Messages" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for the event log, the command message, and detailed error code output with VSSHP.

Chapter 10
Troubleshooting

Refer to "Chapter 10 Troubleshooting" of "ETERNUS VSS Hardware Provider 2.3 User's Guide" for how to deal with errors/warnings and how to obtain error information.

For copy set operation, obtain the following information.

- Copy set file
  Obtain the following file.

Created copy set file (The default file name is as follows: "Installation folder"`\var\vss\copyset.txt`)

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