



Overland  
Storage

# SnapSAN™ VSS Provider

## *User Guide*

S3000/S5000



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# Preface

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This user guide explains how to install, setup, and use the SnapSAN VSS Provider software. VSS Provider is software that facilitates business backup operations by linking the Volume Shadow Copy Service (VSS) of Microsoft® Windows Server® 2003 or Microsoft® Windows Server® 2008 with data replication (VSS Storage Volume Cloning or VSS Provider Replication and Mirroring) and a snapshot function (VSS Provider Snapshots).

This guide assumes that you are familiar with computer hardware, data storage, and network administration terminology and tasks. It also assumes you have basic knowledge of Internet SCSI (iSCSI), Serial-attached SCSI (SAS), Serial ATA (SATA), Storage Area Network (SAN), and Redundant Array of Independent Disks (RAID) technology.

This guide is intended for those who have basic knowledge of backup and recovery using Microsoft Windows Exchange Server 2003 or Microsoft Windows Server 2008 and the VSS Provider snapshot function or data replication function.

This manual explains functions implemented by the following program products:

- VSS Provider Manager and VSS Provider base product
- VSS Provider Control Command

This manual is applicable to the program products of the following versions:

- VSS Provider Manager Ver4.2 or later
- VSS Provider Base Product Ver4.2 or later
- VSS Provider Control Command Ver4.2 or later

The VSS Provider series disk array subsystems is referred to as a disk array in this manual unless clearly specified.

## Product Documentation and Firmware Updates

Overland Storage SnapSAN product documentation and additional literature are available online, along with the latest release of the SnapSAN 3000/5000 software.

Point your browser to:

<http://docs.overlandstorage.com/snapsan>

Follow the appropriate link to download the **latest** software file or document. For additional assistance, search at <http://support.overlandstorage.com>.

## Overland Technical Support

For help configuring and using your SnapSAN 3000/5000, search for help at:

<http://support.overlandstorage.com/kb>

You can email our technical support staff at [techsupport@overlandstorage.com](mailto:techsupport@overlandstorage.com) or get additional technical support information on the [Contact Us](#) web page:

<http://www.overlandstorage.com/company/contact-us/>

For a complete list of support times depending on the type of coverage, visit our web site at:

[http://support.overlandstorage.com/support/overland\\_care.html](http://support.overlandstorage.com/support/overland_care.html)

## Conventions

This document exercises several alerts and typographical conventions.

### Alerts

Convention	Description & Usage
 <b>IMPORTANT</b>	An <i>Important</i> note is a type of note that provides information essential to the completion of a task or that can impact the product and its function.
 <b>CAUTION</b>	A <i>Caution</i> contains information that the user needs to know to avoid damaging or permanently deleting data or causing physical damage to the hardware or system.
 <b>WARNING</b>	A <i>Warning</i> contains information concerning personal safety. Failure to follow directions in the warning could result in bodily harm or death.

### Typographical Conventions

Convention	Description & Usage
<b>Button_name</b>	Words in this special boldface font indicate command buttons found in the Web Management Interface.
Ctrl-Alt-r	This type of format details the keys you press simultaneously. In this example, hold down the Ctrl and Alt keys and press the r key.
NOTE	A Note indicates neutral or positive information that emphasizes or supplements important points of the main text. A note supplies information that may apply only in special cases, for example, memory limitations or details that apply to specific program versions.
Menu Flow Indicator (>)	Words with a greater than sign between them indicate the flow of actions to accomplish a task. For example, Setup > Passwords > User indicates that you should press the <b>Setup</b> button, then the <b>Passwords</b> button, and finally the <b>User</b> button to accomplish a task.
<i>Courier Italic</i>	A variable for which you must substitute a value
<b>Courier Bold</b>	Commands you enter in a command-line interface (CLI)

Information contained in this guide has been reviewed for accuracy, but not for product warranty because of the various environments, operating systems, or settings involved. Information and specifications may change without notice.

## Electrostatic Discharge Information

A discharge of static electricity can damage static-sensitive devices. Proper packaging and grounding techniques are necessary precautions to prevent damage. To prevent electrostatic damage, observe the following precautions:

- Transport products in static-safe containers such as conductive tubes, bags, or boxes.
- Cover the appliance with approved static-dissipating material.
- Use a wrist strap connected to the work surface and properly-grounded tools and equipment.
- Keep the work area free of non-conductive materials such as foam packing materials.
- Make sure you are always properly grounded when touching a static-sensitive component or assembly.
- Avoid touching pins, leads, or circuitry.

# Contents

## Preface

## Chapter 1 - VSS Provider

Overview .....	1-1
Backup .....	1-1
Providers .....	1-2
Software Required .....	1-2
Volume Types .....	1-2
Requestors .....	1-2
Writers .....	1-2

## Chapter 2 - VSS Provider Installation

Install .....	2-3
Uninstall .....	2-5

## Chapter 3 - System Configuration

Hardware Configuration .....	3-1
Software Configuration .....	3-2
Hardware Required .....	3-2
Servers/Software .....	3-2
Snapshot or Data Replication .....	3-3
Snapshot Installation .....	3-3
Data Replication Installation .....	3-3
Volume Types .....	3-3
Initial Setup of Volumes .....	3-4
Backup Server Connected to Data Replication Volume (RV) .....	3-4
Backup and Restore .....	3-5

## Chapter 4 - Error Management

Actions When Error Occurs .....	4-1
Backup Errors .....	4-1
VSS Provider Restarted .....	4-1
Volume to Initial State .....	4-1
Backup Server .....	4-2
Backup Server Connected to Snapshot LV .....	4-2
Backup Server Connected to Data Replication RV .....	4-2
Collecting Information of Unclear Failure .....	4-3

## Chapter 5 - Troubleshooting

Event Log Warning Message .....	5-1
Event Log Error Message .....	5-1

**Appendix A - Error Failure Messages**

**Appendix B - Command Lists**

**Index**

## Overview

This chapter provides an overview of the Volume Shadow Copy Service (VSS) Provider and explains system configuration and other fundamentals. VSS Provider was implemented in Microsoft Windows Exchange Server 2003 and Microsoft Windows Server 2008, as a new function for performing storage management.

## Backup

Backup using VSS Provider is performed by taking a request from the requestor as a trigger. When VSS Provider receives a backup request from the requestor, it performs coordinating operations with the writers and provider, and it instructs the provider to create a replication. The SnapSAN S3000/S5000 operations is performed entirely under the control of VSS Provider. Accordingly, a user can easily carry out non-interrupted backup without becoming involved with complicated scripts for each application, by executing the requestor.

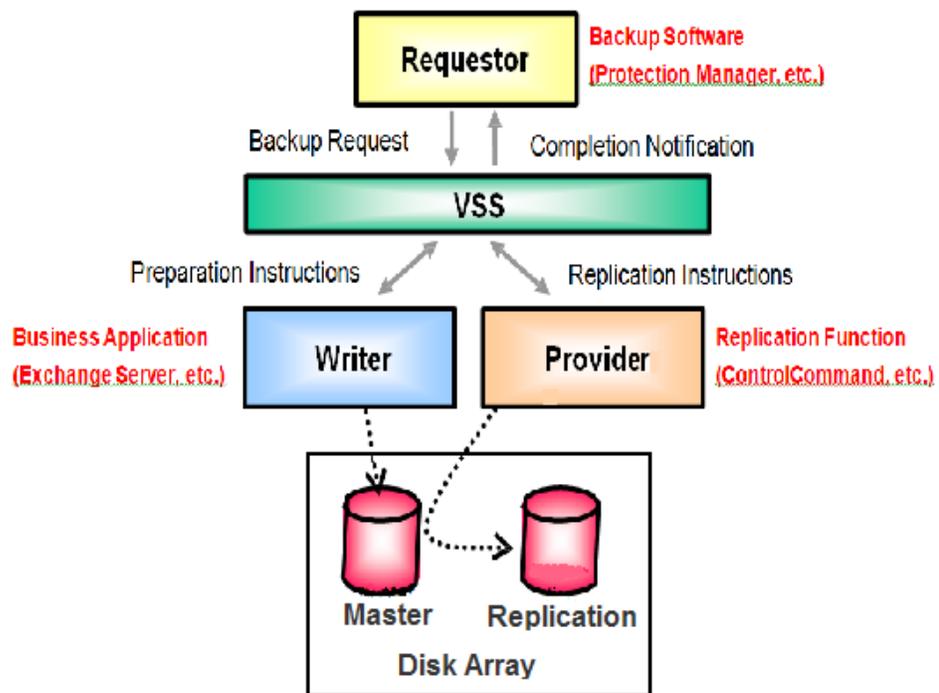


Figure 1-1: VSS Provider Basic Configuration

## Providers

A hardware provider is software exclusively for the in-house manufactured disk arrays (supplied by the storage vendor), makes it possible to create shadow copies using hardware-specific replication functions. VSS Provider is a hardware provider.

A software provider is software that a software vendor supplies for creating shadow copies. The system provider that is supplied by Microsoft Corporation is also a software provider.

## Software Required

The following software is needed on each server or disk array:

### Application Server

- Job management software (Example: JobCenter)
- Requestor (Example: Protection Manager)
- Exchange Server 2003, Exchange Server 2007 or Exchange Server 2010
- VSS Provider
- Control Command

### Backup Server

- Job management software (Example: JobCenter)
- Requestor (Example: Protection Manager)
- Backup software (Example: NetBackup)
- VSS Provider
- Control Command

### Management Server

- SnapSAN Manager

### Disk Array

- Snapshots, Volume Cloning, or Replication and Mirroring
- Access Control

## Volume Types

VSS Provider handles volumes that are subject to snapshot or replication operations by a disk array's logical disk.

## Requestors

VSS Provider supports Protection Manager and other software as requestors.

## Writers

VSS Provider supports the following as a writer:

- Microsoft Exchange Server 2003
- Microsoft Exchange Server 2007

- Microsoft Exchange Server 2010
- File system (NTFS)

# VSS Provider Installation

This chapter provides a description of the basic requirements for installing VSS Provider.

## Operating Environments for Windows Exchange Server 2003.

Item	Description
OS	Windows Exchange Server 2003, Standard Edition (SP1,SP2) Windows Exchange Server 2003, Enterprise Edition (SP1,SP2) Windows Storage Exchange Server 2003, Standard Edition (SP1,SP2) Windows Storage Exchange Server 2003, Enterprise Edition (SP1,SP2) Windows Exchange Server 2003 R2, Standard Edition Windows Exchange Server 2003 R2, Enterprise Edition Windows Exchange Server 2003 R2, Standard Edition (SP2) Windows Exchange Server 2003 R2, Enterprise Edition (SP2) Windows Storage Exchange Server 2003 R2, Standard Edition (SP2) Windows Storage Exchange Server 2003 R2, Enterprise Edition (SP2) Windows Exchange Server 2003, Standard x64 Edition (SP1,SP2) Windows Exchange Server 2003, Enterprise x64 Edition (SP1,SP2) Windows Exchange Server 2003 R2, Standard x64 Edition Windows Exchange Server 2003 R2, Enterprise x64 Edition Windows Exchange Server 2003 R2, Standard x64 Edition (SP2) Windows Exchange Server 2003 R2, Enterprise x64 Edition (SP2)
Software	<ul style="list-style-type: none"> <li>• BaseProduct (including Storage Manager)</li> <li>• Volume Cloning Ver 2 or later</li> <li>• Remote Replication Ver 2 or later,</li> <li>• DynamicSnapVolume or DynamicSnapVolume Ver 3</li> <li>• AccessControl</li> <li>• PathManager</li> <li>• ControlCommand on Windows</li> <li>• Protection Manager</li> <li>• Microsoft® Exchange Server 2003 Standard Edition (SP1,SP2)</li> <li>• Microsoft® Exchange Server 2003 Enterprise Edition (SP1,SP2)</li> <li>• Microsoft® Exchange Server 2007 Standard Edition (Non SP,SP1,SP2,SP3)</li> <li>• Microsoft® Exchange Server 2007 Enterprise Edition (Non SP,SP1,SP2,SP3)</li> </ul>
Memory	Minimum required memory for an application server: Memory required by the OS + 6.0 MB  Minimum required memory for a backup server: Memory required by the OS + 30.0 MB
Disk space	1.2 MB or more

## Operating Environment for Windows Server 2008.

Item	Description
OS	<p>Windows Server 2008, Standard (x86)</p> <p>Windows Server 2008, Enterprise (x86)</p> <p>Windows Server 2008, Standard (x64)</p> <p>Windows Server 2008, Enterprise (x64)</p> <p>Windows Server 2008, Standard (x86) (SP2)</p> <p>Windows Server 2008, Enterprise (x86) (SP2)</p> <p>Windows Server 2008, Standard (x64) (SP2)</p> <p>Windows Server 2008, Enterprise (x64) (SP2)</p> <p>Windows Storage Server 2008, Standard (x64)</p> <p>Windows Storage Server 2008, Enterprise (x64)</p> <p>Windows Storage Server 2008, Standard (x64) (SP2)</p> <p>Windows Storage Server 2008, Enterprise (x64) (SP2)</p> <p>Windows Server 2008 R2, Standard</p> <p>Windows Server 2008 R2, Enterprise</p> <p>Windows Server 2008 R2, Datacenter</p> <p>Windows Server 2008 R2, Standard (SP1)</p> <p>Windows Server 2008 R2, Enterprise (SP1)</p> <p>Windows Server 2008 R2, Datacenter (SP1)</p>
Software	<ul style="list-style-type: none"> <li>• BaseProduct (including Storage Manager)</li> <li>• Volume Cloning Ver 2 or later</li> <li>• Remote Replication Ver 2 or later</li> <li>• DynamicSnapVolume</li> <li>• DynamicSnapVolume Ver 3</li> <li>• AccessControl</li> <li>• PathManager</li> <li>• ControlCommand on Windows</li> <li>• Protection Manager</li> <li>• Microsoft® Exchange Server 2007 Standard Edition (SP1,SP2,SP3)</li> <li>• Microsoft® Exchange Server 2007 Enterprise Edition (SP1,SP2,SP3)</li> <li>• Microsoft® Exchange Server 2010 Standard Edition (Non SP,SP1,SP2)</li> <li>• Microsoft® Exchange Server 2010 Enterprise Edition (Non SP SP1,SP2)</li> </ul>
Memory	<p>Minimum required memory for an application server: Memory required by the OS + 6.0 MB</p> <p>Minimum required memory for a backup server: Memory required by the OS + 30.0 MB</p>
Disk space	1.2 MB or more

## Install

To install VSS Provider, perform the procedure below.

When installing, make sure:

- You are logged in with Administrator privileges.
  - No programs are running.
  - ControlCommand has been installed.
1. Insert the installation CD storing the VSS Provider installer into the CD-ROM drive.  
For this procedure, the "X:" drive is assumed to be assigned to the CD-ROM drive.
  2. From the Windows Start menu, select Run.  
The Run dialog box appears.
  3. Execute the installation program (SETUP.EXE) appropriate for your OS architecture.

Installation program for Windows Exchange Server 2003 x86 architecture or Windows Server 2008 x86 architecture:

```
X:\VSS\SETUP\SETUP.EXE
```

Installation program for Windows Exchange Server 2003 x64 architecture or Windows Server 2008 x64 architecture:

```
X:\VSS\SETUP64\SETUP.EXE
```

4. Perform installation by following the installer instructions.

The following software is installed.

For Windows Exchange Server 2003 x86 architecture or Windows Server 2008 x86 architecture:

- VSS Provider

For Windows Exchange Server 2003 x64 architecture or Windows Server 2008 x64 architecture:

- VSS Provider (x64)

If PathManager is installed on the backup server, perform the following procedure on that server:

### For Windows Exchange Server 2003:

1. Select Start, All Programs, Accessories, System Tools, and then Scheduled Tasks.

Execute the program in the Scheduled Tasks folder that is indicated below.

Add a scheduled task.

2. Use the Scheduled Task wizard to register the program.

Click Next.

3. Select the program to execute.  
Click Browse, and then select one of the following programs in the file selection dialog box that appears:  

```
installation-folder#\iSMrpl\sbin\iSMvss_clear.exe
```

  - # The default installation-folder:  
For Windows Exchange Server 2003 x86 architecture: C:\Program Files\Overland
  - For Windows Exchange Server 2003 x64 architecture: C:\Program Files (x86)\Overland.
4. Under Perform this task, specify when to perform the task.  
Select When my computer starts, and then click Next.
5. Specify the user name and password to use when executing commands.  
Specify the user name and password of a user who has Administrator privileges, and then click Next.
6. Click Finish, and then make sure that the following task has been registered:  

```
iSMvss_clear
```

#### For Windows Server 2008:

1. Select Start, All Programs, Accessories, System Tools, and then Task Scheduler.  
In the Actions pane, click Create Task.
2. On the General tab of the Create Task dialog box, specify the following settings:
  - Name: iSMvss\_clear
  - Security options: select Run whether user is logged on or not
  - Security options: select Run with highest privileges
3. On the Triggers tab of the Create Task dialog box, specify the following settings:
  - Click New to display the New Trigger dialog box.
  - In this dialog box, change the value of Begin the task to At startup.
  - Click OK.
4. On the Actions tab of the Create Task dialog box, specify the following settings:
  - a. Click New to display the New Action dialog box.
  - b. In this dialog box, under Program/script in the Settings area, click Browse, and then select one of the following files in the Open dialog box.  

```
installation-folder*\iSMrpl\sbin\iSMvss_clear.exe
```

    - \* The default installation folder:  
For Windows Server 2008 x86 architecture: C:\Program Files\Overland
    - For Windows Server 2008 x64 architecture: C:\Program Files (x86)\Overland
  - c. Click OK.
5. In the Create Task dialog box, click OK.  
In the Task Scheduler dialog box, the information about the user account to be used to execute this task is requested.  
Enter the user name and password of a user who has Administrator privileges, and then click OK.

In Windows Server 2008, perform the following procedure on the backup server once every day, while a backup is not running.

1. Stop the Volume Shadow Copy service.

```
NET STOP "VSS"
```

2. Stop the Storage VSS Provider service.

```
NET STOP "Storage VSS Provider"
```

- You do not need to start these services. These services start up automatically when the backup is performed.
- In Windows Exchange Server 2003, Windows Exchange Server 2003 R2 or Windows Server 2008 R2, you do not need to perform this procedure.

## Uninstall

This section describes the instructions to uninstall VSS Provider.

When uninstalling, make sure:

- You are logged in with Administrator privileges.
- No programs are running.
- ControlCommand has been installed.

Uninstall VSS Provider or VSS Provider (x64) before uninstalling ControlCommand.

Perform the following procedure before uninstalling VSS Provider or VSS Provider (x64):

1. Make sure that VSS Provider services are not running.

If these services are running, perform the following operations:

2. Stop the Volume Shadow Copy service.
3. Stop the Storage VSS Provider service.
4. If PathManager is installed on the backup server, remove the following registered task from the task scheduler on that server:

```
iSMvss_clear
```

5. In the Control Panel, select Add or Remove Programs or Programs and Features, and then uninstall the following software.

For Windows Exchange Server 2003 x86 architecture or Windows Server 2008 x86 architecture:

- VSS Provider

For Windows Exchange Server 2003 x64 architecture or Windows Server 2008 x64 architecture:

- VSS Provider (x64)

6. Perform uninstallation by following the installer instructions

The following software is uninstalled.

For Windows Exchange Server 2003 x86 architecture or Windows Server 2008 x86 architecture:

- VSS Provider

For Windows Exchange Server 2003 x64 architecture or Windows Server 2008 x64 architecture:

- VSS Provider (x64)

This example shows the system installation procedure by taking a tape backup system in which the SnapSAN S3000/S5000 is used as an example.

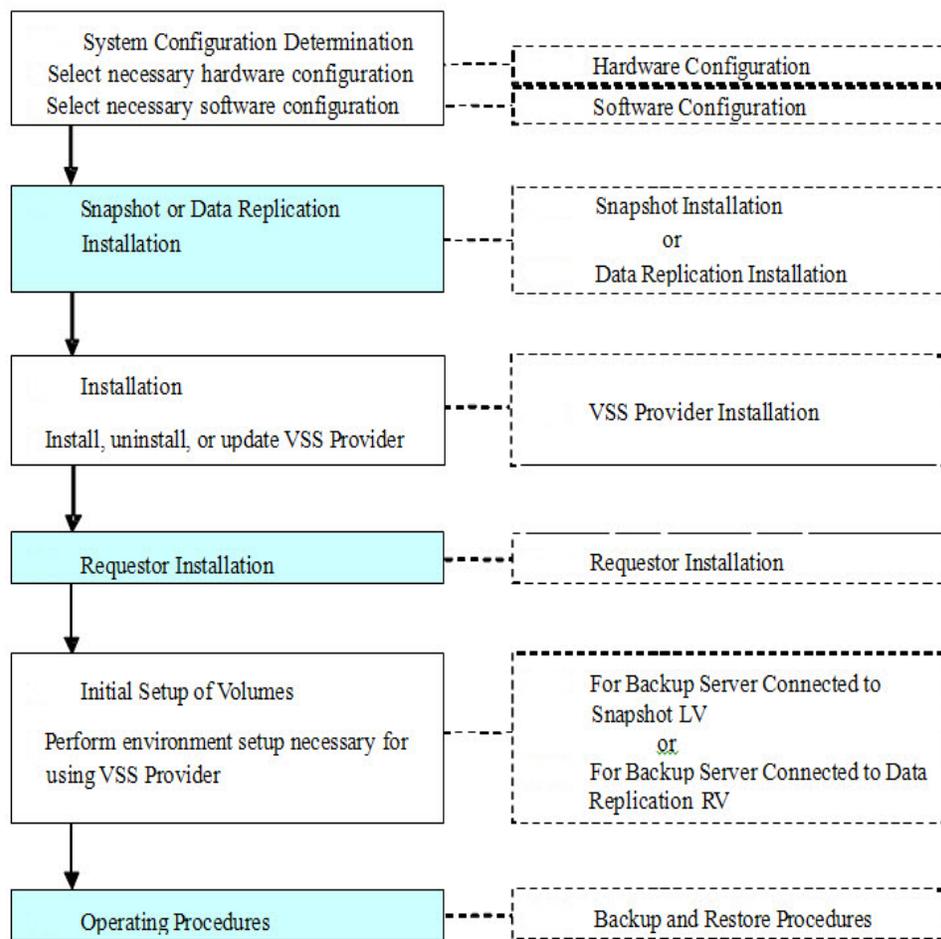
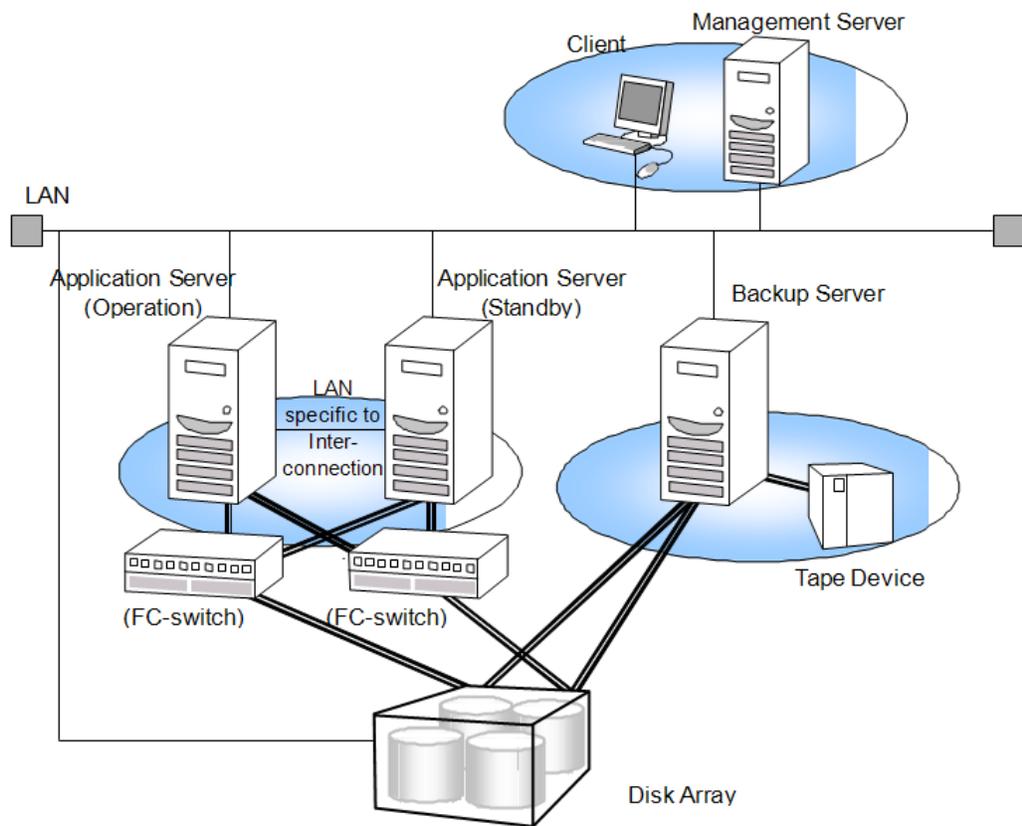


Figure 2-1: Hardware Configuration Flow

## Hardware Configuration

The configuration example shows: hardware components, performance requirements, and disk capacity.



**Figure 3-1: Hardware Configuration Example**

To utilize the snapshot or data replication function more efficiently, separate the application servers, which process tasks from the backup servers. Accordingly, the tape backup operation gives no additional load to application servers.

Though the application or backup server may also be used as a management server, using a specific management server is recommended. Use of LAN connection is strongly recommended for connection with the disk array.

Connect the path of individual servers, to be connected to the disk array, to the port of different directors of the disk array, limiting the servers to be accessed by AccessControl.

## Software Configuration

The example shows a software configuration. Select the software to use from the business equipment and operations mode. The software configuration varies according to the requestor selected.

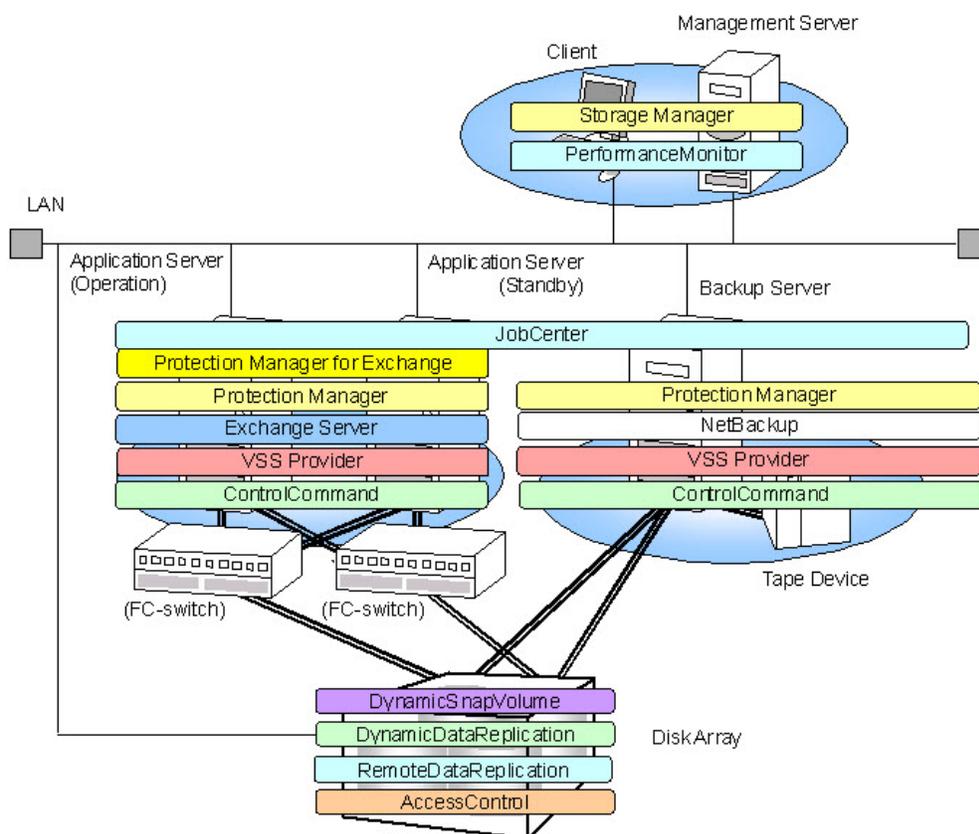


Figure 3-2: Software Configuration Example

### Hardware Required

To install and use VSS Provider, the following hardware is needed:

**Disk Array** – This is a disk array in which the snapshot function (Snapshots) or data replication function (Volume Cloning or Replication and Mirroring) is loaded.

**Application Server** – This performs snapshot or data replication operations.

**Backup Server** – This is arranged to perform backup of data from a replication to tape or other media.

**Magnetic Tape Unit** – This is used if tape backup is needed. Use a tape unit that is supported by the backup software.

**Management Server** – This performs a disk array management. It can also serve as the backup server or application server.

### Servers/Software

Install the software into the following servers:

**Application Server**

- JobCenter
- Protection Manager
- Exchange Server 2003
- VSS Provider
- ControlCommand

**Backup Server**

- JobCenter
- Protection Manager
- NetBackup
- VSS Provider
- ControlCommand

**Management Server**

- SnapSAN Manager

**Disk Array**

- Snapshots, Volume Cloning, or Replication and Mirroring
- AccessControl

## Snapshot or Data Replication

**Snapshot Installation**

Perform “Installation Procedure” to prepare for backup operations where the snapshot function is used.

**Data Replication Installation**

Perform “Installation Procedure” to prepare for backup operations in which the data replication function is used.

**Requestor Installation**

Follow instructions for installing a requestor.

## Volume Types

VSS Provider handles volumes that are subject to snapshot or replication operations by a disk array’s logical disk. When there are multiple partitions or link volumes on one logical disk, depending on the operation, it may not be possible to guarantee data consistency if a replication operation is executed for a volume made up of multiple partitions or link volumes or for a dynamic disk volume. The table below shows the function range for each disk.

**Table 3-1: Available Volume Type**

Disk Type	Volume Type	Availability
Basic disk	Primary partition (MBR format)	√
	Primary partition (GPT format)	√
	Link Volume on expanded partition	-
Dynamic disk	Simple volume	-
	Spanned volume	-
	Striped volume	-
	Mirror volume	-
	RAID5 volume	-

√: **Recommended configuration -: Operation inhibited**

## Initial Setup of Volumes

### Backup Server Connected to Snapshot link volume (LV)

When performing backup operations in which the snapshot function is used, the initial setup below is necessary. Execute identical operations for target volumes used in backup operations. The volume states, which are the states in which “Installation Procedure” in the “Snapshot User’s Manual (Installation and Operation Guide for Windows)” ended, are assumed to be “active” for the SV state and “unlink” for the LV link state.

1. Start a command prompt on the backup server.
2. Confirm that volumes used in backup operations have been registered in the volume list created in (Installation and Operation Guide for Windows)” and re-create the volume list.  

```
> iSMvollist -a
```
3. In order to change the LV access restriction to Not Available (NA), stop the volume beforehand.  
Here, the setting is made for logical disk name lv001.  

```
> iSMvss -devmode disable -vol lv001 -volflg ld
```
4. Change the LV access restriction to Not Available (NA). Here, settings are made for logical disk names lv001 and sv001.  

```
> iSMsc_link -lv lv001 -lvflg ld -sv sv001 -svflg ld -lvacc na
```

```
> iSMsc_unlink -lv lv001 -lvflg ld
```

The above is the end of environment setup for operation using the snapshot function.

## Backup Server Connected to Data Replication Volume (RV)

When performing backup operations in which the data replication function is used, the initial setup below is necessary. Execute identical operations for target volumes used in backup operations.

1. Start a command prompt on the backup server.
2. Confirm that volumes used in backup operations have been registered in the volume list created in “Data Replication Installation”.
  - a. If they are not registered, re-create the volume list.
 

```
> isMvollist -a
```
  - b. If the RV is replicate state, execute Separate to separate the Master Volume (MV) and RV and make the RV available. Here, execute using the settings below. If the RV is separated, the command below need not be executed.
    - Access restriction for RV after separated: rw (Read/Write) (Default value)
    - Specify wait for separation to complete

```
> isMrc_separate-mv mv001-mvflg ld-rv rv001-rvflg ld-wait
```
3. In order to change the RV access restriction to Not Available (NA), stop the volume beforehand. Here, the setting is made for logical disk name rv001.
 

```
> isMvss -devmode disable -vol rv001 -volflg ld
```
4. Change the RV data state to invalid and the RV access restriction to Not Available (NA). Here, the setting is made for logical disk name rv001.
 

```
> isMrc_rvmode -rv rv001 -rvflg ld -rvdata invalid -rvacc na -force
```

The above is the end of environment setup for operation using the data replication function.

## Backup and Restore

Follow backup and restore operations.

## Actions When Error Occurs

This chapter explains how to address errors that occur during backup when VSS Provider is used.

### Backup Errors

When an error has occurred during backup, investigate the cause of the error using the procedure below and re-execute the backup after eliminating the cause of the error.

1. Verify if the error was output in the application's event log.
2. If you were able to confirm the error number and error message, check Appendix A "Error Messages at Time of Failure".
3. Refer to the explanation in (Measure) and eliminate the cause of the error.

If there are unformatted partitions, a warning may be output to the (application) event log when executing VSS Provider backup. This does not affect backup processing. For details, refer to "Event Log Warning Message".

### VSS Provider Restarted

When the VSS Provider must be restarted, follow the instructions:

1. From the Windows (Start) button, select (Administrative Tools) > (Services).
2. Select (VSS Provider) and restart it.
3. Confirm that the service was started.

### Volume to Initial State

Sometimes, an LV or RV for performing VSS Provider backup enters a state in which backup is not possible because of an error during backup. To initialize the state of the LV or RV to a state in which re-execution is possible, different operations are needed for operation in which the snapshot function is used and operation in which the data replication function is used. Execute the operations for LV or RV for which backup failed.

If Protection Manager is selected as a requester, troubleshoot by referring to the "CLI Command Reference Guide".

## Backup Server

### Backup Server Connected to Snapshot LV

This section describes the procedure that returns a volume to its initial state when an error occurred during operation using the snapshot function. Execute the procedure below for all volumes subject to backup.

1. Start a command prompt on the backup server.
2. Check the LV state. Here, the state of logical disk name lv001 is checked.

```
> isMsc_linkinfo -vol lv001 -volflg ld
```

Sample output:

```
Specified Volume Information
LV:LD Name: lv001
Type: WN
Volume Name: \\?\Volume{91eaf2a9-4e8a-11d9-861c-505054503030}\
Path: -
State: link
Mode: rw
```

3. If “State” for the LV is “link”, the connection to the SV must be unlinked. Here, settings are made for logical disk name lv001. If “State” for the LV is “unlink” the command below is not necessary.

```
> isMsc_unlink -lv lv001 -lvflg ld
```

4. If “Mode” of the LV checked in (2) is other than “NA”, stop the volume beforehand in order to change the LV access restriction to Not Available (NA). Here, the setting is made for logical disk name lv001.

```
> isMvss -devmode disable -vol lv001 -volflg ld
```

If the target volume is already stopped, the message below is output. Proceed to execute the procedure in (5).

```
isMvss: Err:iSM20519: Specified disk cannot be disabled.
```

5. Change the LV access restriction to Not Available (NA). Here, settings are made for logical disk names lv001 and sv001.

```
> isMsc_link -lv lv001 -lvflg ld -sv sv001 -svflg ld -lvacc na
```

```
> isMsc_unlink -lv lv001 -lvflg ld
```

6. Cancel the “SV guard classification” of the SV. Here, the SV guard classification of snapshot volume sv001 of logical disk name bv001 is canceled.

```
> isMsc_svguard -bv bv001 -bvflg ld -sv sv001 -svflg ld -mode cancel
```

- a. If the target volume is already canceled, the message below is output.  
isMsc\_svguard:Info: iSM19127: Request has already completed.

The above is the end of the volume initialization procedure for operation using the snapshot function.

### Backup Server Connected to Data Replication RV

This section describes the procedure that returns a volume to its initial state when an error occurred during operation using the data replication function. Execute the procedure below for all volumes subject to backup.

Start a command prompt on the backup server.

1. Check the RV state. Here, the state of logical disk name rv001 is checked.

```
> iSMrc_query -rv rv001 -rvflg ld
```

Sample output:

```
MV: Disk No.-
LD Namemv001
Type WN Volume Name- Path-
RV: Disk No.2
LD Namerv001
TypeWN

Volume Name\\?\Volume{91eaf297-4e8a-11d9-861c-505054503030}\ Path-
Activity Stateseparate Sync State separated Copy Control State-
Separate Start Time2004/12/24 14:24:53

Separate End Time2004/12/24 14:24:53

Separate Diff32KB Copy Diff 0KB RV Accessrw
Previous Activesep/exec
```

2. If “Activity State” of the RV is “replicate”, it is necessary to separate the RV from the MV. This is executed here using the settings below. If “Activity State” of the RV is “separate”, the command below need not be executed.

- Access restriction for RV after separated: rw (Read/Write) (Default value)
- Specify wait for separation to complete

```
> iSMrc_separate -mv mv001 -mvflg ld -rv rv001 -rvflg ld -wait
```

3. If “RV Access” of the RV checked in (2) is other than “NA”, stop the volume beforehand in order to change the RV access restriction to Not Available (NA). Here, the setting is made for logical disk name rv001.

```
> iSMvss -devmode disable -vol rv001 -volflg ld
```

If the target volume is already stopped, the message below is output. Proceed to execute the procedure in (5).

```
iSMvss: Err:iSM20519: Specified disk cannot be disabled.
```

4. Change the RV data state to invalid and the RV access restriction to Not Available (NA). Here, settings are made for logical disk name rv001.

```
> iSMrc_rvmode -rv rv001 -rvflg ld -rvdata invalid -rvacc na -force
```

The above is the end of the volume initialization procedure for operation using the data replication function.

## Collecting Information of Unclear Failure

Even when performing the procedures above, if an error occurs during backup, execute the commands in the procedure below to gather an operation trace and other fault information.

Login as Administrator.

1. Click the Windows [Start] button, and select and execute [All Programs] → [ControlCommand] → [SnapSAN Manager Volume List] → [Difficulty Information Gather]. When changing the directory of the storage destination and executing, specify a directory on the appropriate server and do not specify a directory on a separate server connected by a network.
2. Confirm that the iSMvolgather directory is created under the installation directory when the storage destination directory is not changed or under the specified directory when it is changed, and obtain the files under that directory.

Moreover, since VSS Provider utilizes the snapshot or data replication function, if a failure occurs, also refer to the measures for errors described in the “Snapshot User’s Manual - Windows” or the “Data Replication User’s Manual - Windows”.

## Event Log Warning Message

If there is even one unformatted partition on the server that executes VSS Provider backup (including volumes not subject to backup), the (sample) warning below may be output to the (application) event log. This applies to SnapSAN Manager cluster partitions and others.

```
Type: Warning Source:VSS Event ID:12290
Explanation: Volume Shadow Copy Service warning: GetVolumeInformationW
(\\?\Volume{941f0b7b-120c-11d9-b701-505054503030}\,NULL,0,NULL,
NULL,(0x00000000], , 260) == 0x00000057. hr = 0x00000000.
```

## Event Log Error Message

For Windows Server 2008, if there is a volume on the backup server whose state is Not Ready, such as an RV being replicated or LV being unlinked, the (example) error below may be output to an event log of the backup server by performing a VSS Provider backup.

**Table 5-1: Output Example**

Variable	Output
Log name	System
Type	Error
Source:	Virtual Disk Service
Event ID:	1
Explanation	An unexpected error occurred Error code 13@02000018
Log name:	Application
Type	Error
Source:	VSS Provider
Event ID	12289
Explanation	Volume shadow copy service error: Unexpected error IOCTL_DISK_GET_DRIVE_LAYOUT_EX

This error does not affect the operation.

## Stopping Service

To stop the (VSS Provider) service of during regular operation, follow the procedure below.

1. Stop the (Volume Shadow Copy) service.
2. Stop the (VSS Provider) service.

### Path Manager Warning Message

The Path Manager version to be used must be V3.3 or later. If Path Manager has been installed, the warning below may be output in the (application) event log.

Type: Warning

Source: spsdsm

Event ID: 530

Description: A path is lost.

To replace this warning message with an information message, follow the procedure below.

1. Start a command prompt on the backup server.
2. Execute the following command:  
> spscmd -seteventmode 1

The above is the end of the setting of Path Manager.

# Error Failure Messages

The “Message List” provides explanations of the error messages that are output to the event log in message ID order. An explanation of each message is given in the format below.

```
iSMxxxxx: AAAAA<aaa>,<bbb...b>
Message ID (iSMxxxxx) and message body (AAAAA<aaa>,<bbb...b>) are
described
```

Descriptions using angle brackets such as <aaa> and <bbb...b> indicate that parameter values are not fixed. (The angle brackets “<” and “>” are not displayed in the actual message.)

Term	Description
<b>Type</b>	Message classification (ERROR, WARNING, or INFO) is described.
<b>Explanation</b>	This field describes the causes of the message output, etc. Parameters in the message are also described in this field.
<b>Measure</b>	This field describes measures to be taken.

**iSM13300****iSM13300: VSS HW provider started successfully.**

Term	Description
Type	INFO
Explanation	Shows that VSS Provider started
Measure	Unnecessary

**iSM13301: VSS HW provider terminated by force.**

Term	Description
Type	INFO
Explanation	Shows that VSS Provider was forcibly terminated
Measure	Check the operation status by referring to the event log or other information

**iSM13302: VSS HW provider terminated successfully.**

Term	Description
Type	INFO
Explanation	Shows that VSS Provider was forcibly terminated normally
Measure	Unnecessary

**iSM13420: Shadow Copy session is aborted.**

Term	Description
Type	WARNING
Explanation	Shows that a shadow copy session with the VSS Provider service aborted. This is output if a session with the VSS Provider service aborted after being established.
Measure	Check the operation status by referring to the event log or other information.

**iSM13421: Failed to delete a parameter control file. (<aaa...a>)**

Term	Description
Type	WARNING
Explanation	Shows that deletion of a parameter control file failed. aaa...a: Parameter control file name
Measure	Check the operation status by referring to the event log or other information.

**iSM13850: VSS HW Provider is called by a non-administrative privileged process**

**iSM13852: Specified volume does not exist in a vollist file. SerialNumber=<aaa...a>,**

Term	Description
Type	ERROR
Explanation	Shows that VSS Provider was called by a process that does not have Administrator privileges.
Measure	Re-execute following login to the Windows OS by a user who has Administrator privileges.

**Idn=<bbb... b>**

Term	Description
Type	ERROR
Explanation	Shows that the specified volume does not exist in the volume list. aaa...a: Unit serial number bbb...b: Logical disk number
Measure	Re-create the volume list.

**iSM13853: Specified volume <aaa...a> is not paired.**

Term	Description
Type	ERROR
Explanation	Shows that the logical disk indicated by aaa...a was not paired or was forcibly unpaired. aaa...a: Logical disk name
Measure	After checking messages output by ControlCommand, check whether there is a mistake in setup

**iSM13854: No suitable RV was found for MV <aaa...a>**

Term	Description
Type	ERROR
Explanation	Shows that the logical disk indicated by aaa...a was not paired or was forcibly unpaired. aaa...a: Logical disk name
Measure	After checking messages output by ControlCommand, check whether there is a mistake in setup.

**iSM13858: Memory allocation (malloc) error.**

Term	Description
Type	ERROR
Explanation	Allocation of a memory area failed.
Measure	It is possible that the memory area is insufficient. To use this program, secure free memory area by add-in or other means.

**iSM13859: Failed to replicate. MV=<aaa...a>, RV=<bbb...b>**

**iSM13860: Parameter error. (Invalid Snapshot Set ID**

Term	Description
Type	ERROR
Explanation	Replication failed. aaa...a: MV logical disk name bbb...b: RV logical disk name
Measure	After checking messages output by ControlCommand, check whether there is a mistake in setup.

**<aaa...a>)**

Term	Description
Type	ERROR
Explanation	A parameter error occurred. The Snapshot Set ID is invalid. aaa...a: Snapshot Set ID
Measure	After saving the information below, restart the VSS Provider service. <ul style="list-style-type: none"> <li>ControlCommand operation log (iSMrpl.log)</li> <li>Event log</li> </ul>

**iSM13861: Failed in waiting for the synchronized state. MV=<aaa...a>, RV=<bbb...b>>**

Term	Description
Type	ERROR
Explanation	A wait for completion of replication failed. aaa...a: MV logical disk name bbb...b: RV logical disk name
Measure	After checking messages output by ControlCommand, check whether there is a mistake in setup.

**iSM13862: Failed to separate. MV=<aaa...a>, RV=<bbb...b>**

Term	Description
Type	ERROR
Explanation	Separation failed. aaa...a: MV logical disk name bbb...b: RV logical disk name
Measure	After checking messages output by ControlCommand, check whether there is a mistake in setup.

**iSM13863: Failed in waiting for the separated state. MV=<aaa...a>, RV=<bbb...b>**

Term	Description
Type	ERROR
Explanation	A wait for completion of separation failed. aaa...a: MV logical disk name bbb...b: RV logical disk name
Measure	After checking messages output by ControlCommand, check whether there is a mistake in setup.

**iSM13864: Parameter error. (Invalid LUN information)**

Term	Description
Type	ERROR
Explanation	A parameter error occurred. The LUN information is invalid.
Measure	<p>After saving the information below, restart the VSS Provider service.</p> <ul style="list-style-type: none"> <li>ControlCommand operation log (iSMrpl.log)</li> <li>Event log</li> </ul>

**iSM13865: Failed to change LUN <aaa...a> to data-valid state.**

Term	Description
Type	ERROR
Explanation	Shows that a snapshot attribute change failed.aaa...a: Logical disk name of operation target (RV)
Measure	If you select Protection Manager as a requester, after checking the state and pairing of the logical disk, set the volume to its initial state.

**iSM13866: Failed to change LUN <aaa...a> from NotAvailable state.**

Term	Description
Type	ERROR
Explanation	Shows that snapshot volume unmasking failed. aaa...a: Logical disk name of operation target (RV or LV)
Measure	If you select Protection Manager as a requester, after checking the state and pairing of the logical disk, set the volume to its initial state.

**iSM13872: Failed to change LUN <aaa...a> to data-invalid state.**

Term	Description
Type	ERROR
Explanation	Shows that a snapshot attribute change failed.
Measure	If you select Protection Manager as a requester, after checking the state and pairing of the logical disk, set the volume to its initial state.

**iSM13874: No suitable SV was found for BV <aaa...a>**

Term	Description
Type	ERROR
Explanation	Shows that no SV suitable for VSS Provider backup was found for the logical disk name indicated by aaa...a. aaa...a: Logical disk name
Measure	After checking messages output by ControlCommand, check whether there is a mistake in setup.

**iSM13875: Failed to create. BV=<aaa...a>, SV=<bbb...b>**

Term	Description
Type	ERROR
Explanation	Shows that snapshot creation failed. aaa...a: BV logical disk name bbb...b: SV logical disk name
Measure	After checking messages output by ControlCommand, check whether there is a mistake in setup.

**iSM13876: Failed in waiting for the active state. BV=<aaa...a>, SV=<bbb...b>**

Term	Description
Type	ERROR
Explanation	Shows that a wait for snapshot completion failed. aaa...a: BV logical disk name bbb...b: SV logical disk name
Measure	After checking messages output by ControlCommand, check whether there is a mistake in setup

**iSM13877: Failed to import. LDNAME=<aaa...a>**

Term	Description
Type	ERROR
Explanation	Shows that importing of a snapshot failed aaa...a: Logical disk name of import target (RV or LV)
Measure	If you select Protection Manager as a requester, after checking the state and pairing of the logical disk, set the volume to its initial state. It is also possible that the control volume was not set. Check the control volume setting.

**iSM13880: Environment variable 'iSMrpl' not defined.**

Term	Description
Type	ERROR
Explanation	The environment variable iSMrpl is not defined. [Measure] Confirm that ControlCommand has been installed.
Measure	If ControlCommand is installed, restart the server.

**iSM13881: Environment variable 'iSMvol' not defined.**

Term	Description
Type	ERROR
Explanation	The environment variable iSMvol is not defined. [Measure] Confirm that ControlCommand has been installed.
Measure	If ControlCommand is installed, restart the server.

**iSM13882: LD attribute is neither MV nor BV. (ldattr=<a>)**

**iSM13883: MV=<aaa...a>, RV=<bbb...b>**

Term	Description
Type	ERROR
Explanation	[Explanation] The logical disk to be backed up is not the MV or BV. a: Internal number showing type of logical disk 0: IV 4: RV 8: LV 16: SV
Measure	[Measure] If you select Protection Manager as a requester, after checking the state and pairing of the logical disk, set the volume to its initial state. The specified pair is in the restore state.

Term	Description
Type	ERROR
Explanation	The specified pair is in a restore state. aaa...a: MV logical disk name bbb...b: RV logical disk name
Measure	Check the activity state of the specified pair and change it to separated or replicate synchronous.

**iSM13884: Failed to change copy control state. MV=<aaa...a>, RV=<bbb...b>**

Term	Description
Type	ERROR
Explanation	A copy control state change failed. aaa...a: MV logical disk name bbb...b: RV logical disk name
Measure	After checking messages output by ControlCommand, check whether there is a mistake in setup.

**iSM13885: The parameter control file analysis error. (<aaa...a>=<bbb...b>)**

Term	Description
Type	ERROR
Explanation	[Explanation] Parameter control file analysis failed. aaa...a: Parameter control file key name bbb...b: Value corresponding to key name
Measure	[Measure] After saving the information below, restart the VSS Provider service y ControlCommand operation log (iSMrpl.log) y Event log

**iSM20502: Illegal control option.**

Term	Description
Type	ERROR
Explanation	The iSMvss command syntax is invalid.
Measure	Specify parameters correctly.

**iSM20503: Environment variable 'iSMrpl' is not defined.**

Term	Description
Type	ERROR
Explanation	ControlCommand is not correctly installed.
Measure	Install ControlCommand correctly.

**iSM20504: Insufficient option. (<aaa...a>)**

Term	Description
Type	ERROR
Explanation	A required iSMvss command option is not specified. aaa...a: Unspecified option
Measure	Specify the option correctly.

**iSM20505: Environment variable 'iSMvol' is not defined.**

Term	Description
Type	ERROR
Explanation	ControlCommand is not correctly installed.
Measure	Install ControlCommand correctly.

**iSM20506: Illegal <aaa...a> type. <bbb...b>**

Term	Description
Type	ERROR
Explanation	[Explanation] The type that was specified for the pairvolflg or mode parameter is invalid. aaa...a: pairvolflg or mode bbb...b: The specified type
Measure	[Measure] Specify pairvolflg or mode correctly.

**iSM20507: Illegal volflg type. <aaa...a>**

Term	Description
Type	ERROR
Explanation	The type that was specified for the volflg parameter is invalid. aaa...a: The specified type
Measure	Specify volflg correctly.

**iSM20508: Illegal requester type. <aaa...a>**

Term	Description
Type	ERROR
Explanation	The type that was specified for the requester parameter is invalid. aaa...a: The specified type
Measure	Specify requester correctly.

**iSM20509: Illegal rvacc type. <aaa...a>**

Term	Description
Type	ERROR
Explanation	The type that was specified for the rvacc parameter is invalid. aaa...a: The specified type
Measure	Specify rvacc correctly.

**iSM20510: Illegal rvuse type. <aaa...a>**

Term	Description
Type	ERROR
Explanation	The type that was specified for the rvuse parameter is invalid. aaa...a: The specified type
Measure	Specify rvuse correctly.

**iSM20511: iSMrc\_Isdev: API Error has occurred.**

Term	Description
Type	ERROR
Explanation	An error occurred during internal processing.
Measure	Make sure that the volume list was correctly created.

**iSM20512: Specified volume does not exist in Logical disk list.****iSM20513: Failed to receive volume information.**

Term	Description
Type	ERROR
Explanation	The target volume was not registered to the volume list.
Measure	Check the volume list.

Term	Description
Type	ERROR
Explanation	An error occurred during internal processing.
Measure	Make sure that ControlCommand was correctly installed.

**iSM20514: Specified disk type is not supported.****iSM20515: Specified targets are not paired.**

Term	Description
Type	ERROR
Explanation	The LD type is invalid.
Measure	Change the LD type to WN or WG.

Term	Description
Type	ERROR
Explanation	The target volumes were not paired.
Measure	Set up the target volumes as a pair by using Volume Cloning, Replication and Mirroring, or Snapshots.

**iSM20516: Parameter control file write error.**

Term	Description
Type	ERROR
Explanation	Writing to a control file failed.
Measure	Check the system operation state by referring to the event log or other information.

**iSM20517: Illegal devmode type. <aaa...a>**

Term	Description
Type	ERROR
Explanation	The type that was specified for the devmode parameter is invalid. aaa...a: The specified type
Measure	Specify devmode correctly.

**iSM20518: Specified disk cannot be enabled.**

Term	Description
Type	ERROR
Explanation	Enabling a device failed.
Measure	Check the system operation state by referring to the event log or other information.

**iSM20519: Specified disk cannot be disabled.**

Term	Description
Type	ERROR
Explanation	Disabling a device failed.
Measure	Check the system operation state by referring to the event log or other information.

The table contains a list of commands.

No.	Command Name	Operation	Explanation
1	iSMvss	Change state of recognition by OS for LV or RV.	Changes the state of recognition by the OS for a LV or RV.
	iSMvss_clear	Initialize the device entry information.	Allows all operating systems to recognize devices. Unnecessary device entry information is deleted from the registry.
2			

Remarks (1) iSMvss and iSMvss\_clear can be used by installing VSS Provider.

(2) iSMvss and iSMvss\_clear can be executed only by users belonging to the Administrators group.

## Command Reference

iSMvss

### [NAME]

iSMvss - Changes state of recognition by OS for LV or RV.

### [SYNOPSIS]

iSMvss -devmode *dev\_mode* -vol *volume* -volflg *vol\_flg*

### [DESCRIPTION]

The iSMvsscommand changes the state of recognition by the OS for a LV or RV.

### [OPTIONS]

The iSMvsscommand recognizes the following options:

-devmode *dev\_mode* Specifies the state of recognition by the OS.

Either of the following can be specified in *dev\_mode*.

dPuts the volume in a stop state.

enable Enable recognition by OS.

Puts a volume for which disablehad been specified in a start state.

-vol *volume* Specifies the LV or RV volume.

A logical disk name can be specified in *volume*.

-volflg *vol\_flg* Specifies the type of the volume specified in -vol.

This parameter must be specified together with `-vol`. The *vol\_flg* that can be specified here is limited to `ld`.

### [USAGE]

(1) Change the state of OS recognition for a LV to stop state (disable).

A message is not output if the command succeeds.

```
C:\> iSMvss-devmode  disable-vollv001-volflgd
```

```
C:\>
```

(2) If the state of OS recognition for a LV could not be changed to stop state (disable)

```
C:\> iSMvss-devmode  disable-vollv001-volflgd iSMvss: Err:iSM20519: Specified disk
cannot be disabled. C:\>
```

### [NOTES]

- iSMvss cannot be executed if the access restriction of the LV or RV subject to the operation is “na”.
- iSMvss cannot be executed if the state of OS recognition for the LV or RV subject to the operation is the same as the specified state.
- iSMvss cannot be executed if the disk array in which the LV or RV subject to the operation is stored is in a frozen state.

### [RETURN VALUE]

0: Change of state of OS recognition of LV or RV terminated normally.

1: Change of state of OS recognition of LV or RV terminated abnormally. iSMvss terminates abnormally in the following cases.

- A parameter is invalid.
- A condition for operation is not satisfied.
- An attempt to operate a disk array fails.

### iSMvss\_clear

#### [NAME]

iSMvss - Initializes device entry information.

#### [SYNOPSIS]

```
iSMvss_clear iSMvss_clear delete
```

#### [DESCRIPTION]

The `iSMvss_clear` command changes all the volumes that were set to the disablestate (which prevents volumes from being recognized by the OS) by the `iSMvss` command to the enablestate (which allows volumes to be recognized by the OS).

This command also deletes unnecessary device entry information from the registry.

**[OPTIONS]**

The iSMvss\_clearcommand recognizes the following options:

None Changes all the volumes to the enablestate (which allows volumes to be recognized by the OS).

delete Deletes unnecessary device entry information from the registry.

**[USAGE]**

(1) Change all the volumes that were set to the disablestate (which prevents volumes from being recognized by the OS) by the iSMvsscommand to the enablestate (which allows volumes to be recognized by the OS).

Use this command by registering it to the task scheduler so that it is executed at computer startup.

```
C:\> iSMvss_clear
```

```
C:\>
```

(2) Delete unnecessary device entry information from the registry.

Execute this command after performing a backup using VSS Provider.

```
C:\> iSMvss_clear delete
```

```
C:\>
```

- If a computer is restarted when a device is in the disablestate (which prevents the device from being recognized by the OS), a backup using VSS Provider after computer startup may fail.

Register the iSMvss\_clearcommand (with no option) to the task scheduler so that it is executed at computer startup.

- Unnecessary device entry information accumulates when a backup using VSS Provider is repeated.

If the amount of such information increases, the OS may fail to recognize Plug and Play devices. Execute the iSMvss\_cleardeletecommand after performing a backup using VSS Provider.

**[RETURN VALUE]**

0: Normal termination

1: Abnormal termination

## A

AccessControl 3-1  
Application server 3-2

## B

Backup has Errors 4-1  
Backup server 3-2, 3-3  
Backup Server Connected to Data  
Replication RV 4-2  
Backup Server Connected to Snapshot  
LV 3-4, 4-2  
Backup using VSS 1-2  
Basic 3-4  
Basic disk 3-4

## C

Collecting Information of Unclear  
Failure 4-3  
ControlCommand 2-1, 2-3, 2-5  
customer support 1-ii

## D

Data Replication Installation 3-3  
Disk array 3-2, 3-3  
Dynamic disk 3-4  
dynamic disk 3-3  
DynamicSnapVolume 2-1, 2-2

## E

Error 4-1  
Event Log Error Message 5-1  
Event Log Warning Message 5-1  
expanded partition 3-4

## H

Hardware Configuration Flow 2-6

## I

Initial Setup of Volumes 3-4  
iSMvolgather 4-4

## M

Magnetic tape unit 3-2  
Management server 3-2, 3-3  
Message Output Format A-2  
multiple partitions 3-3

## O

Operating Environment 2-1  
Overland Technical Support 1-ii

## P

Path Manager Warning Message 5-2  
Primary partition (GPT format) 3-4  
Primary partition (MBR format) 3-4

## R

Remote Replication 2-1, 2-2  
Requestor 1-2  
requestor 3-2  
Requestor Installation 3-3  
Requestors 1-2  
Returning Volume to Initial State 4-1

## S

- shadow copies 1-2
- Snapshot Installation 3-3
- Software Configuration 3-2
- Stopping Service 5-1

## T

- technical support 1-ii

## V

- Volume Shadow Copy Service 1-1
- VSS 1-1
- VSS Provider 1-2, 4-1, 4-4
- VSS Provider Installation and Operation Procedures 2-6
- VSS Provider Service Restarted 4-1

## W

- Writers 1-2
- writers 1-1