HP 3PAR VSS Provider 2.1.0 Software for Microsoft Windows
User's Guide

Abstract

This user's guide provides the information you need to install and use the HP 3PAR VSS (Volume Shadow Copy Service) Provider Software for Microsoft Windows. This guide is intended for System Administrators and Microsoft Windows Administrators who are responsible for maintaining the Microsoft Windows operating system environment and who understand Microsoft Windows 2003 and 2008.



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1 Introduction

Related Documents

The following documents also provide information related to the HP 3PAR Storage System:

For information about...	Read the...
Using the InForm Command Line Interface (CLI) to configure and manage the system	*HP 3PAR InForm OS CLI Administrator's Manual*
Using the HP 3PAR Management Console's user interface to configure and manage the HP 3PAR Storage System	*HP 3PAR InForm OS Management Console Online Help*
Using the HP 3PAR Command Line Interface (CLI) for remote clients to install and configure Recovery Manager	*HP 3PAR InForm OS Command Line Interface Reference*
Identifying system components and fixing problems	*HP 3PAR InForm OS Messages and Operator's Guide*
Understanding the system and its features	*HP 3PAR InForm OS Concepts Guide*
Shadow copies using HP 3PAR VSS Provider Software for Microsoft Windows	*HP 3PAR VSS Provider Software for Microsoft Windows User's Guide*

Typographical Conventions

The following typographical conventions are used in this guide:

Typeface	Meaning	Example
ABCDabcd	Used for dialog box elements such as titles and button labels.	Enter your system name in the **Value** box and click **OK**.
`ABCDabcd`	Used for file names, paths, and screen output, and for text you are to enter.	`Found < 12 > 73G disks.` Enter `cli` at the Windows command prompt.
`ABCDabcd`	Used to contrast your input with system output.	`cli% removevv VV1` `Removing vv VV1.`
`<ABCDabcd>`	Used for variables in file names, paths, and screen output, and variables in user input.	[root@(*`<systemID-nodeID>`*)root] `To continue Enter your system name ==>`*`<systemname>`*.

Advisories

To avoid injury to people or damage to data and equipment, be sure to observe the cautions and warnings in this guide. **Always be careful when handling any electrical equipment.**

WARNING! Warnings alert you to actions that can cause injury to people or irreversible damage to data or the operating system.

CAUTION: Cautions alert you to actions that can cause damage to equipment, software, or data.

NOTE: Notes are reminders, tips, or suggestions that supplement the procedures included in this guide.

2 Overview

This chapter provides an overview of supported components and system requirements for HP 3PAR VSS Provider Software for Microsoft Windows.

Microsoft VSS

Microsoft includes VSS in the Windows 2003 and 2008 operating systems to simplify the enterprise's storage environment. VSS provides a framework for creating a point-in-time copy of a single volume or multiple volumes.

Microsoft Windows Server 2003 and 2008 VSS work with VSS-aware applications to determine when a volume shadow copy (snapshot) can be made. A snapshot is a copy of some data set, (a disk volume for example), at a given point-in-time.

VSS Provider for Microsoft Windows-Aware Components

Microsoft provides a Software Development Kit (SDK) to enable independent hardware and software vendors to interface with their components. This includes applications, data stores, snapshot engines, and backup applications that interface with HP 3PAR VSS Provider Software for Microsoft Windows.

VSS Provider for Microsoft Windows was developed with VSS SDK, release 7.2 for Windows 2003 and Windows Server 2008 Platform SDK, as part of the VSS provider implementation.

To ensure absolute data integrity for all volumes, especially those that are interrelated, the application, the backup program, and the backup device should be VSS aware, meaning that the components participating in the backup must be specifically programmed to work with VSS Provider for Microsoft Windows. These components are called writers, requestors, and providers, and are described in detail in Table 1 (page 5).

Table 1 VSS Provider for Microsoft Windows Components

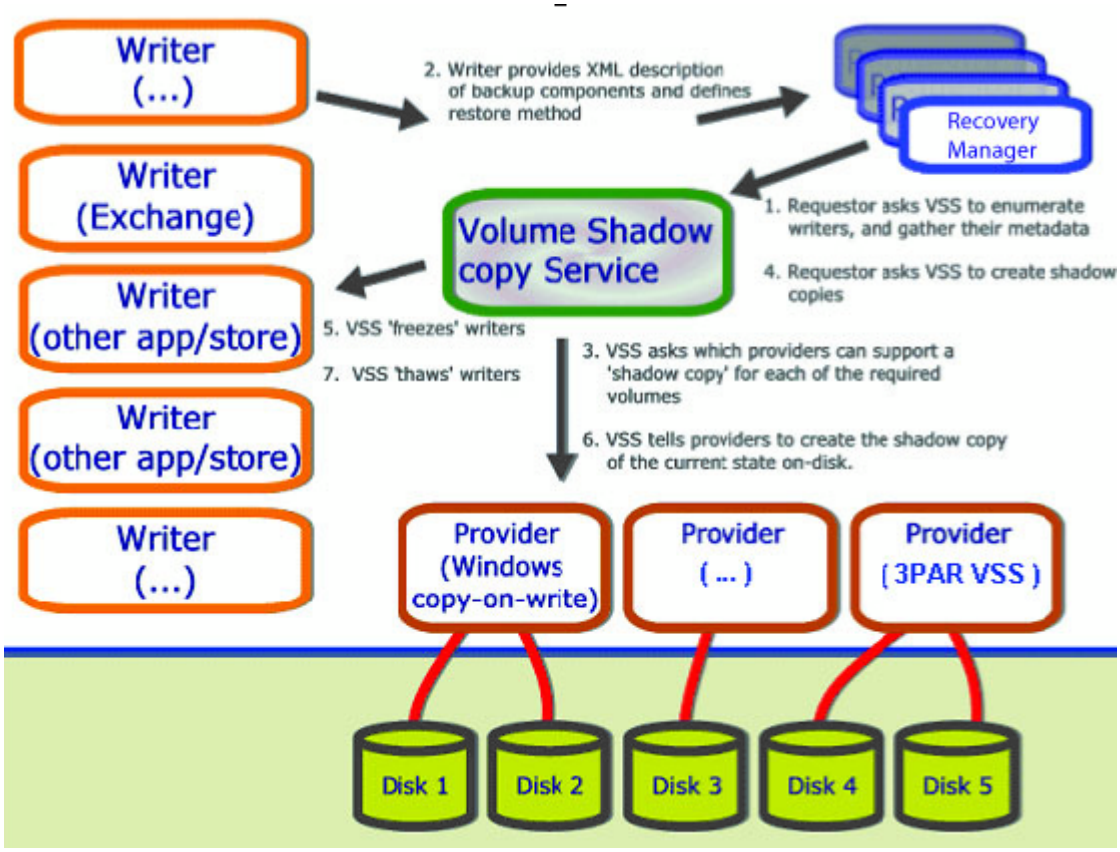
VSS Component	VSS Component Description
Requestor	The requestor is backup software that initiates the creation of the shadow copy.
Writer	The writer is any application software that participates in the shadow copy process and whose files and data are included in the process.
Provider	The provider is the storage technology that performs the actual shadow copy.

Operation of VSS Provider for Microsoft Windows

VSS Provider for Microsoft Windows (Figure 1 (page 6)) communicates with the operating system and applications, and temporarily freezes computing tasks to allow for the creation of and removal of snapshots. The freeze function allows for the creation of a snapshot that reflects the state of application data at a given point in time. When the process resumes, the original volume will continue to change while the shadow copy of the volume remains constant.

VSS Provider for Microsoft Windows also gives permission for the backup application to access the volume and back it up in its frozen state. The shadow copy volume is then used for the actual backup. After the shadow copy volume is saved on the backup device, the shadow copy is deleted.

Figure 1 VSS Provider for Microsoft Windows Operation Overview



Host System Requirements

- For the latest Microsoft Windows server and system service pack requirements, refer to the *HP 3PAR InForm OS Configuration Matrix*. To obtain a copy of this documenation, go to http://www.hp.com/go/3par, navigate to your product page, click **HP Support & Drivers**, and then click **Manuals**.
- HP 3PAR CLI installation.

  For the supported CLI version, see the appropriate *HP 3PAR InForm OS Configuration Matrix*.To obtain a copy of this documenation, go to http://www.hp.com/go/3par, navigate to your product page, click **HP Support & Drivers**, and then click **Manuals**.
- The Windows logical volume must be configured as a Basic Disk and located on the virtual volume.
- Microsoft .Net Framework 3.5.
- Microsoft Visual C++ Redistributable Package.

HP 3PAR Storage System Requirements

- InForm OS with the HP 3PAR Virtual Copy Software license enabled.

  For the supported InForm OS release, refer to the appropriate *HP 3PAR InForm OS Configuration Matrix*. To obtain a copy of this documenation, go to http://www.hp.com/go/3par, navigate to your product page, click **HP Support & Drivers**, and then click **Manuals**.
- The VSS Provider for Microsoft Windows license must be enabled on the system.

  Refer to the *HP 3PAR InForm OS Command Line Interface Reference* for instructions on verifying the license from the HP 3PAR Storage System.

- Snapshot space must be available on Virtual Volumes. In order to take snapshots on the base volume, the volume itself must have snapshot space allocated during the base volume creation.

  See the *HP 3PAR InForm OS Command Line Interface Reference* for instructions on creating a base volume with snapshot allocation, or assigning snapshot space after the base volume is created.

- All systemhost ports associated with the same physical host should belong to the same virtual domain.

Support for Multiple HP 3PAR Storage System Connections

VSS Provider for Microsoft Windows supports multiple system connections to the same host server where VSS Provider for Microsoft is installed. This allows VSS hardware snapshots to be managed from a host that is connected to multiple systems via HBA or iSCSI.

Consider the scenario where Exchange 2007 CCR is deployed in an organization with HP 3PAR Recovery Manager Software for Exchange. The Recovery Manager for Exchange backup server will have connections to two HP 3PAR Storage Systems where the Active Exchange Server is connected to the first sysetm and the Passive Exchange Server is connected to the second system. In order for the Recovery Manager for Exchange backup server to support this type of CCR configuration, the VSS Provider on the backup server needs to have access to both systems to manage the snapshots accordingly.

Support for multiple HP 3PAR Storage Systems can be accommodated by registering the additional systems using the `ProvCfg.exe` command available under the VSS Provider installation folder. See "Using the ProvCfg Command to Set Up or Modify a System Connection" (page 15) for more information.

NOTE: By default, the VSS Provider for Microsoft Windows installation provides support for a single system registration. Additional systems need to be set up and registered using the `ProvCfg.exe` utility.

Features

The following features are included in VSS Provider for Microsoft Windows:

- Atomic Shadow Copy creation.

  Supports up to 64 shadow copies per volume (snapshots to a volume) within a shadow copy set.

- Writable Snapshot Volume.

  Provides a pont-in-time writable snapshot volume by using the copy-on-write technique to the Volume Shadow Copy Service. This is a very quick process with little storage space required. See the *InForm OS Concepts Guide* for more information about poin-in-time snapshots and the copy-on-write technique.

- User mode DLL installed as a Windows service to provide communication between VSS and HP 3PAR Storage Systems.
- Recovery Manager for Exchange.

  Provides the capability to take a non-destructive virtual copy from Microsoft Exchange 2003 and 2007 for backup and fast recovery.

- Recovery Manager for SQL.

  Provides the capability to take a non-destructive virtual copy from Microsoft SQL Server for backup and fast recovery.

- Veritas NetBackup.

  Support for Veritas NetBackup through the VSS snapshot method.

- Transportable shadow copy.

  Supports transportable shadow copy to allow import from another system.
- x86 and x64 platform support.

  Provides 32-bit and 64-bit installation packages for working with x86 and x64 platforms.
- Secure systemconnection.

  Connects to the system using the encrypted authentication information.
- Support for the following:
  - Microsoft VSS Transportable shadow copy.
  - Egenera environment.
  - VMware environment.
  - iSCSI configurations.
- Command line interface for system connection setup.

  A command line interface is provided to quickly determine and modify connection settings.
- Support for multiple system configurations.

  Provides the capability to handle VSS snapshots on different systems that are connected to the local host.

Special Considerations

- Auto-Import Shadow Copies are not supported on Windows Cluster service.

  Windows Cluster service cannot accommodate LUNs with duplicate signatures and partition layout. The shadow copy LUNs must be transported to a host outside the cluster, or the original volume must be dismounted before the shadow copy can be imported. This is a limitation of the Window Cluster service.
- Shadow Copies Containing Dynamic Disks must be Transported.

  The native support for dynamic disks cannot accommodate LUNs with duplicate signatures and configuration database contents. The shadow copy LUNs must be transported to a different host. VSS enforces this by not allowing auto-import shadow copies of dynamic disks. A requestor should not import a transportable shadow copy back to the same host. This is a limitation on Dynamic Disk.
- Create Shadow Copy Volumes Read-Only and Hidden.

  VSS sets flags on each affected LUN such that the resulting shadow copy will be hidden and read-only when detected by a Windows Server 2003 or 2008 system. Drive letters and/or mount points are not automatically assigned. VSS maintains these flags throughout the lifecycle of a shadow copy. Modification of these flags may lead to unpredictable results.
- Shadow Copy Attribute Context.

  The following are shadow copy attributes supported by passing in the shadow copy context:
  - The shadow copy is persistent across reboots.
  - The shadow copy is not automatically deleted when the shadow copy requestor process ends. The shadow copy can be deleted only by a call to:

    `IvssBackupComponents::DeleteSnapshots`
  - No writers are allowed in creating the shadow copy.

- The shadow copy is currently not exposed to the requestor.
- A copy-on-write mechanism is used to implement shadow copies.

The following shadow copy attributes are not supported in the current release of 3PAR VSS Provider for Microsoft Windows:

- All shadow copies are created with a copy-on-write mechanism.
- All shadow copies are hidden.

- Taking a snapshot on a System Drive is not supported.

  With the additional System Writer involved on the System Drive, taking snapshots on a database where its physical location is on the System Drive is not supported.

- Volume-wide snapshot.

  A virtual copy is taken of the entire volume. Data outside the backup scope that might reside on the same snapshot LUNs is not restorable from the virtual copy.

- Same snapshot set containing VVs from different sytems is not supported.

  VSS Provider can not support volumes from different systems to be processed within the same snapshot set.

- Importing snapshots created on Windows 2003 to 2008 and vice versa is not supported. This is a Microsoft VSS limitation.
- All snapshots imported through VSS will be exposed via host name only. Export on a specific port and matched set is not supported.
- All snapshots imported through VSS will be exposed to the first available host name registered in the same HP 3PAR Storage System that belongs to the current Windows system.

3 Installation, Upgrade, and Deinstallation

System Setup

VSS Provider for Microsoft Windows serves as a communication bridge between Microsoft VSS and HP 3PAR Storage Systems during the creation and removal of a volume shadow copy (snapshot).

To set up the Windows host for VSS Provider for Microsoft Windows:

1. Log on as the System Administrator.

   As the Windows System Administrator, you will need a user name and password for VSS.

2. Install the HP 3PAR Administration Tools onto the Windows server. See the *HP 3PAR InForm OS Command Line Interface Reference and HP 3PAR InForm Management Console* help to install the Administration Tools onto a Windows environment.

Creating an InForm User Using the InForm OS Command Line

If an InForm user does not exist, use the CLI `createuser` command to create and grant users permission to use VSS Provider for Microsoft Windows, and use the `setpassword` command to specify a user password.

The user should have the 3PAR_RM, edit or super role to be used with VSS Provider for Microsoft Windows.

Refer to the *HP 3PAR InForm OS Command Line Interface Reference* and the *HP 3PAR InForm OS CLI Administrator's Guide* for details on using the CLI commands to create a user with the appropriate privileges and roles.

NOTE: The system setup, including the InForm OS Command Line for Microsoft Windows installation, must be completed prior to the VSS Provider for Microsoft Windows installation.

Installing VSS Provider for Microsoft Windows

NOTE: Prior to installing VSS Provider for Microsoft Windows, the host server must have the InForm CLI installed and configured. All corresponding HP 3PAR Storage Systems need to have an HP 3PAR Virtual Copy Software license and a VSS Provider for Microsoft Windows license enabled. For instructions on installing and configuring the InForm CLI, refer to "System Setup" (page 10).

NOTE: If you are installing the application through a remote desktop session, the newly added environment variables will not become effective until you log off from the current session. It is recommended that you install the application directly from the system console.

NOTE: By default, the VSS Provider for Microsoft Windows installation only provides support for a single system registration. Additional systems need to be set up and registered using the `ProvCfg.exe` utility.

1. Ensure that the correct level of the Windows operating system is installed.
   a. For Windows 2003, perform the following:
      1. Click **Start→My Computer**.
      2. Right-click **My Computer**.
      3. Click **Properties** to look for system information under the **General** tab.
   b. For Windows 2008, click **Start→Programs→Administrative Tools→Server Manager**.
   c. Ensure that Microsoft Windows Server and the appropriate Service Pack is displayed. Refer to the appropriate *HP 3PAR InForm OS Configuration Matrix*. To obtain a copy of this documenation, go to http://www.hp.com/go/3par, navigate to your product page, click **HP Support & Drivers**, and then click **Manuals**.
2. Log in as the System Administrator.
3. Insert the VSS Provider for Microsoft Windows CD into the CD-ROM drive.
4. Click **Start→My Computer** to expand the CD-ROM drive directory.
5. Click the **VSSProvider** directory.
6. Click the **Setup_2k3.exe** command as seen for x86 (32-bit) platform. As an alternative, you can select **Setup_2k3_x64.exe** for the x64 (64-bit) platform.
7. Follow the instructions in the **3PAR VSS Provider for Microsoft Windows installer** window.

   NOTE: The **Disk Cost** button analyzes the amount of available storage space and compares it to the amount required for the 3PAR VSS Provider for Microsoft Windows installation.

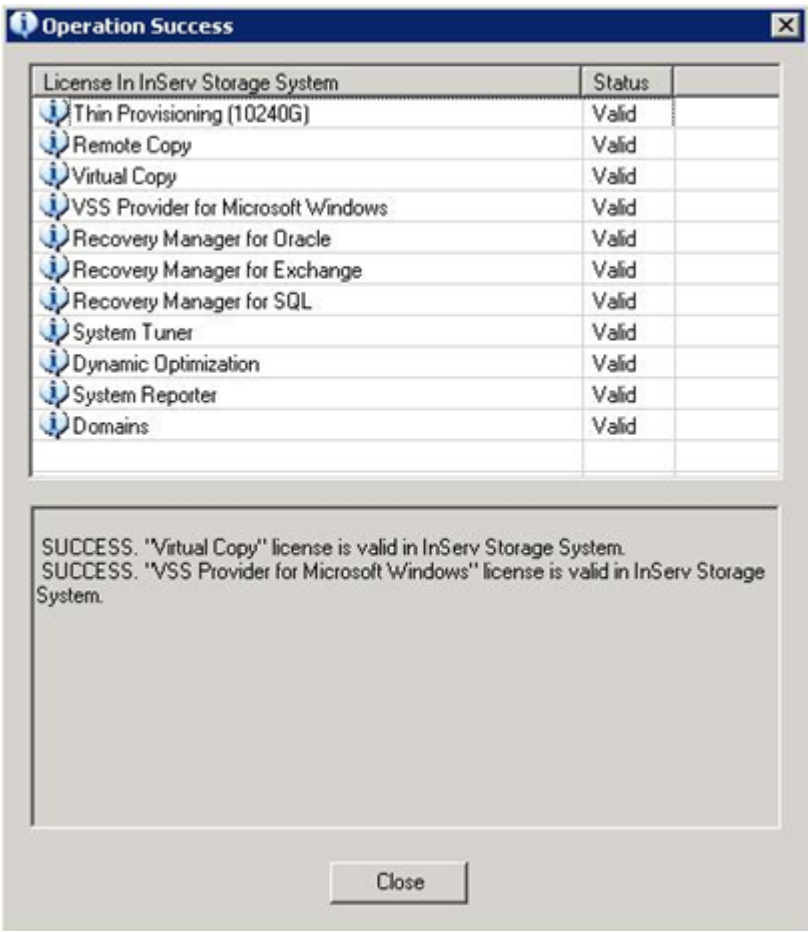
   The **InServ Storage System Connection Configuration** window appears to collect the HP 3PAR Storage System name and the InForm user information and password. This information is required when connecting to the system using the InForm Command Line.
8. Click **Next**.

   The HP 3PAR Storage System connection from the **InServ Storage System Connection Configuration** window appears.

9. Enter the following information and then click **OK**:
   - **System Name**: The system name or IP address.
   - **User Name**: InForm user ID; see the *HP 3PAR InForm OS Command Line Interface Reference* for information on determining the user name.
   - **Password**: The password associated with the specified user name.
   - **Use SSL for InServ CLI Connection**: Select this option to use SSL for socket connections to the system.

   If the licences are valid for VSS and other required components, an **Operation Success** message box appears with a license entry for VSS Provider for Microsoft Windows and the other components indicating that their status is valid.

Figure 2 Operation Success Window



The columns displayed in this window are as defined as follows:

- **License In InServ Storage System**: This column shows the list of licenses on the HP 3PAR system.
- **Status**: This column indicates the state of the license on the system.

NOTE: A red cross icon indicates that the HP 3PAR system does not have either HP 3PAR Virtual Copy Software or VSS Provider for Microsoft Windows licenses enabled. Installation will be terminated at this point.

NOTE: A warning icon indicates that the system does not have Recovery Manager for Exchange, Recovery Manager for SQL, or an HP 3PAR Remote Copy Software license available, which are essential to Recovery Manager-related products. This serves as a reminder without affecting the VSS Provider installation.

NOTE: The information you supply for the system configuration needs to be properly validated before the installation can continue. Encrypted authentication information will be stored in the Windows registry under the key name InServConfig for VSS Provider for Microsoft Windows.

NOTE: The host InForm CLI version and InForm OS version must be at the same level.

During the installation, a Windows command prompt will be launched to register VSS Provider for Microsoft Windows. The Windows command prompt is closed automatically after the registration has completed.

NOTE: If Remote Desktop Connection was used to install VSS Provider for Microsoft Windows, you must log out of the session and re-connect to refresh the connection after the installation has completed. You can then activate the Remote Desktop Connection.

Verifying the Installation

Verify the installation of VSS Provider for Microsoft Windows as follows:

1. Log on as System Administrator.
2. Verify that VSS Provider for Microsoft Windows is listed as a service that is currently running.
   a. For Windows 2003 perform the following:
      1. Click **Start**.
      2. Right-click **My Computer**.
      3. Click **Manage**.
      4. Expand the **Services and Applications** tree node.
      5. Click **Services**.
   b. For Windows 2008 perform the following:
      1. Click **Start**→**Programs**→**Administrative Tools**→**Server Manager**.
      2. Expand the **Configuration** tree node.
      3. Click **Services**.
3. Verify Provider registration of VSS Provider for Microsoft Windows from a command line prompt by issuing the `vssadmin list providers` command. Verify `3PAR VVS Provider` and the current version of VSS Provider are displayed in the command's output.
4. Review the installation `3parprov.log` installation log file that is located in the `%SYSTEMROOT%` directory. A listing for VSS Provider for Microsoft Windows indicates that the installation was successful.

System Registry Values

After installing VSS Provider for Microsoft Windows, a **3par** →**HWPRV** registry key is created under **HKEY_LOCAL_MACHINE** →**Software**.

CAUTION: **DO NOT** edit the registry key value unless asked to do so by your local service provider for support purposes.

NOTE: For tracking purposes, you may need to modify the value for **LogLevel** to a higher number in order to record more detailed information to a file. By default, the log level is set to the highest level of detail.

Valid registry values for VSS Provider for Microsoft Windows are shown in Table 2 (page 14).

Table 2 Registry Values for VSS Provider for Microsoft Windows.

Name	Value
CurrentVersion	The current release version for VSS Provider for Microsoft Windows.
InstallDir	The directory where VSS Provider for Microsoft Windows is installed.
LogLevel	The trace level that is set for the log file in the directory specified by LogPath. 1. error occurred 2. warning 3. Information 4. routine route 5. verbose The default value is set to "5".
LogPath	The location where the log file resides.
TimeOut	The timeout value set for SCSI inquiry and InForm CLI operations; the default is 180 seconds.
InServID	The system ID of the system r to which VSS is connected. This entry is under the InServConfig sub-key.
InServName	The system to which VSS is connected. This entry is under the InServConfig sub-key.
InServPasswd	Encrypted authentication information that enables access to the system non-interactively from the Windows service program. This entry is under the InServConfig sub-key.
EnableSSL	Specifies whether an SSL connection is to be used: 0 Disable use of SSL for CLI connection. 1 Enable use of SSL for CLI connection. This entry is under the InServConfig sub-key.
ProductID	Identification information for the registered system. This entry is under the InServConfig sub-key.
Retry	A numeric value (in seconds) set for the CLI command to retry.
NoBlock	Setting this option skips volume write protection in the storeage level and rely on Windows I/O control during snapshot creation. This option is only applicable for InForm OS version 3.1.1 and above. Value of 1 is enable (default). 0 is disable.
SyncDelay	Setting this option adjusts the internal holding timeout for synchronous Remote Copy support during snapshot creation. Valid values are from 0 to 9, with 8 as default.
SyncRC	Setting this option supports synchronous Remote Copy operation for Recovery Manager for Exchange and Recovery Manager for SQL. A value of 1 is enable (default). 0 is disable.

NOTE: The system configuration details under the InServConfig root key serves as the default entry for backward compatibility for single system configurations. To add additional system entries, refer to "Using the ProvCfg Command to Set Up or Modify a System Connection" (page 15) for more information.

Upgrading from a Previous Version

WARNING! Make sure that no backup jobs are running in the background, and that any running applications are closed prior to upgrading VSS Provider for Microsoft Windows.

NOTE: If you have previously installed VSS Provider for Microsoft Windows, you may remove the definition of environment variables TPDSYSNAME and TPDPWFILE. Both environment variables are no longer valid for the current VSS Provider release.

1. Log in as the System Administrator.
2. Insert the VSS Provider for Microsoft Windows CD into the CD-ROM drive.

3. Click **Start→My Computer** to expand the CD-ROM drive directory.
4. Click the **VSSProvider** directory.
5. Click the **Setup_2k3.exe** command as seen for x86 (32-bit) platform. As an alternative, you can select **Setup_2k3_x64.exe** for the x64 (64-bit) platform.
6. Follow the instructions in the **3PAR VSS Provider for Microsoft Windows installer** window.

NOTE: The **Select Installation Folder** displays the previous version's installed path. Do not change the path during the upgrade process.

During the upgrade, the system registration wizard is not launched. The upgrade process retains the previous system registration information. A Windows command prompt is launched to register VSS Provider Software for Microsoft Windows. The Windows command prompt automatically closes once the upgrade is complete.

Verifying the Upgrade

To verify that the upgrade was successful, refer to "Verifying the Installation" (page 13).

Removing VSS Provider for Microsoft Windows

To remove VSS Provider for Microsoft Windows:

1. Log on as System Administrator.
2. Click **Start→Control Panel**.
3. Depending on your operating system, click **Add or Remove Programs** or **Programs and Features**.

   Result: The **Add or Remove Programs** window appears.
4. Select **3PAR VSS Provider For Microsoft Windows**.
5. Click **Remove or Uninstall**.
6. Verify the deinstallation procedure by viewing the `3parprov.log` file located in the `%SYSTEMROOT%` directory.

   The deinstallation entry in the log file should indicate that the application has been successfully removed.

Using the ProvCfg Command to Set Up or Modify a System Connection

To use the `ProvCfg` command:

1. Open a Windows command prompt.
2. Enter `ProvCfg.exe` and press **ENTER**.

The following subcommands and options can be used with the `ProvCfg` command to list the details of, and modifiy the configuration set up for, VSS Provider for Microsoft Windows:

COMMAND

```
ProvCfg.exe
```

DESCRIPTION

The `ProvCfg` command is used to view or modify the configuration settings.

SYNTAX

```
ProvCfg InServ|Conn|Log [options <arg>]
```

SUBCOMMANDS

`InServ`

Used to view or modify the communication setup for the system.

`Conn`
Used to view or modify the connection settings.

`Log`
Used to view or modify the log level.

OPTIONS

- The following options can be used with the `InServ` subcommand:

`-sys <name>`
Specifies the system name.

`-user <name>`
Specifies the system er user name used to generate the password file.

`-pass <password>`
Specifies the system password used to generate the password file.

`-sockssl on|off`
Specifies whether SSL should be used for the socket connections to the system.

`-remove <name>`
Removes the specified systemconfiguration.

`-detail`
Shows additional license and connection information.

`-default`
Sets as default entry.

- The following options can be used with the `Conn` subcommand:

`-timeout <secs>`
Optional. Specifies the timeout value in seconds to wait for a response from the system.

`-retry <num>`
Optional. Specifies the number of retries after a response timed out from system.

`-noblock Yes|No`
Optional. Specifies whether to use the no block option on the system when creating virtual copies. This option is only applicable for InForm OS 3.1.1 and above.

`-syncrc Yes|No`
Optional. Enables (`Yes`) or disables (`No`) synchronous Remote Copy.

- The following option can be used with the `Log` subcommand:

`-level <num>`
Changes log level details output to the log file. The valid range is from 1 to 5. The default value is 5.

USAGE:

- To view the current system communication setup, issue `ProvCfg InServ`.
- To view all system communication setups, issue `ProvCfg InServ [-detail]`.
- To view a specific system communication setup, issue `ProCfg InServ [-sys <name>] [-detail]`.
- To add or modify the system communication setup, issue `ProvCfg InServ [-sys <name>] [-user <name>] [-pass <password>] [-sockssl on|off]`.
- To enable or disable the use of SSL, issue `ProvCfg InServ [-sys <name>] [-sockssl on|off]`.

- To set as default entry, issue `ProvCfg InServ [-sys <name>] [-default].`
- To remove an existing system setup, issue `ProvCfg InServ [-sys <name> [-remove].`
- To view the current connection configuration, issue `ProvCfg Conn.`
- To enable or disable the no block option when creating virtual copies, issue`ProvCfg Conn -noblock Yes|No.`
- To view the current log level, issue `ProvCfg Log.`
- To change the current log level, issue `ProvCfg Log -level <num>.`

EXAMPLES:

- The following command adds a new entry for the system configuration.

```
ProvCfg InServ -sys MyInServ -user myuser -pass mypassword
```

- The following command changes the log level to 4.

```
ProvCfg Log -level 4
```

- The following command changes the timeout value to 120 seconds.

```
ProvCfg Conn –timeout 120
```

NOTE: For backward compatibility, the default configuration is used for single system architecture. Use the `–default` option to set a configuration to the default values.

NOTE: Any change to the username and password information used to generate the system authentication information requires a local authentication update using the following command:

`ProvCfg InServ –sys <sysname> -user <username> -pass <password>`

NOTE: To add an additional system configuration, use the following command:

`ProvCfg InServ –sys <sysname> -user <username> -pass <password>`

Make sure that the Windows system is connected to the new system via an FC/ ISCSI port prior to the addition.

NOTE: Any change to the `Log` or `InServ` options using the `ProvCfg.exe` utility requires that both the Volume Shadow Copy Service and the VSS Provider for Microsoft Windows service be restarted.

4 HP 3PAR Remote Copy Software and VSS Provider

Purpose of Remote Copy Software

HP 3PAR Remote Copy Software can be used to safeguard against disasters that may occur at one location by keeping a copy of valuable data at another location. For example, if there was a fire or earthquake at a particular location, all of the data stored there could be lost unless a backup copy is maintained somewhere where the data can be recovered. Remote Copy Software, (supported through the system), can prevent this kind of disastrous scenario. When using Remote Copy Software, two systems are used: a primary that is used for production, and secondary that is used for backup purposes. When disaster strikes in one location, there is always a backup at the secondary site. See the *HP 3PAR Remote Copy Software User's Guide* for complete information about Remote Copy Software.

How It Works

When users want to synchronize the data from the production (local) site to secondary site, VSS Provider for Microsoft Windows works with Recovery Manager for Microsoft Exchange and/or Recovery Manager for Microsoft SQL to freeze the I/O at the application level, and then takes a local snapshot of the mailbox database (Exchange), database (SQL) and log volumes.

- For Remote Copy in periodic mode, once the snapshot is taken, Remote Copy performs a synchronization on the data changes to the target volumes at the secondary site. After the synchronization is complete, the target server connected to the HP 3PAR system at the secondary site will create a virtual copy on the Remote Copy target volumes and then save the information in its repository at the secondary site.
- For synchronous Remote Copy, a snapshot is taken on the remote site at the same time the local snapshot is taken.

NOTE: Recovery Manager for Exchange and Recovery Manager for SQL autodetects the Remote Copy mode.

NOTE: The target server serves as the backup server at the secondary site. After synchronization has completed, a virtual copy will be created and managed by the target server at the secondary site.

NOTE: For Remote Copy in periodic mode, a virtual copy created on the primary site for Remote Copy purposes will be removed after synchronization has completed.

NOTE: For Remote Copy in synchronous mode, a virtual copy created on the primary site for Remote Copy purposes will be retained after synchronization has completed.

NOTE: In order for the Recovery Manager GUI to manage virtual copies from the remote target server, you must register the Mailbox Server or SQL database using the exact server name and instance name.

NOTE: In order for successful execution of Remote Copy operations for Recovery Manager for SQL, the systems in the Remote Copy setup must be configured to be the default HP 3PAR systems using the hardware provider tool, `provcfg.exe`. Otherwise, Recovery Manager for SQL cannot locate the relevant Remote Copy groups, resulting in the failure of Remote Copy operations.

Setting Up Remote Copy

In order to use the Remote Copy Software, you must first install and configure a Remote Copy environment.

NOTE: Remote Copy Software requires a Remote Copy Software license. Contact your local service provider for details.

NOTE: See the *HP 3PAR Remote Copy Software User's Guide* for details on how to set up Remote Copy.

Once you have Remote Copy set up between two HP 3PAR systems, you should create a Remote Copy group for testing before going to the next step.

Setting Up Remote Copy Groups for Databases

Observe the following restrictions when setting up Remote Copy groups:

- Every database's log and database file should be added in one Remote Copy group. Two or more databases in one Remote Copy group are not supported.
- Database files from the same database and log files from the same database located in the different Remote Copy group are not supported.
- If the database is not in the Remote Copy group the Remote Copy feature cannot be used.

Follow these steps to set up Remote Copy for a given database:

1. Identify the volumes that contain the database and log files to be copied.
2. Create one Remote Copy group for one database.
3. Add the volumes belonging to the database files and log files into the Remote Copy group with Remote Copy target volumes.
4. Synchronize the Remote Copy group.

Recovering a Database from a Secondary Site

In the event of a database crash at a primary site, you should have a dedicated target server at the secondary site that is setup in an identical manner to the original production server for recovery purposes (same configuration includes instance names, database names, structures, and with Windows authentication mode set in the same way as well).

You can use the backup server of Recovery Manager for Exchange or Recovery Manger for SQL at the secondary site with the following procedure:

1. Mount the virtual copy to the production server.
2. Log onto the production server, stop the Exchange or SQL instance and its dependent services.
3. From the mounted snapshot volumes, manually copy all necessary database and log files to the corresponding database location.
4. Restart the Exchange or SQL instance and its dependent services.
5. Log back onto the backup server, unmount the virtual copy.

Synchronous Long Distance Remote Copy Support

NOTE: If you are performing a promote restore for volumes in a Synchronous Long Distance Remote Copy relationship, you must manually stop Remote Copy before initiating the volume promote restore.

5 Diagnostics

Volume Shadow Copy Service Trace

If the failure of the VSS request has been determined to be outside the scope of VSS Provider for Microsoft Windows, gather the following information for Microsoft support:

- Windows Application Event Log
- Windows System Event Log
- Volume Shadow Copy Service Trace

For VSS Provider for Microsoft Windows debug purposes, turn on VSS logging by setting up the registry data value on the VSS registry:

`[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\VSS\Debug\Tracing]`

To eliminate the risk of modifying the registry database, VSS Provider for Microsoft Windows provides the `vsstrace.reg` registry file for assistance with turning on VSS logging.

- The file `vsstrace.reg` is located under the VSS Provider for Microsoft Windows installation directory. Since VSS logging is volume based, the log file cannot be on the volume as part of the shadow copy set.
- The default location for the trace file is set to `c:\vsstrace.txt`. Modify it to fit into your system if necessary.
- Use Windows Explorer to locate the `vsstrace.reg` file. Double-click this file to make it active.
- The trace log will be appended. In order to receive meaningful information, clear out the contents before a new run begins.
- To turn off the VSS tracing, remove the following registry key from the registry database:

`[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\VSS\Debug\Tracing]`

NOTE: You can use the `ProvCfg.exe` utility with the `Log` subcommand to specify the appropriate log level. See "Installation, Upgrade, and Deinstallation" (page 10) – "Using the ProvCfg Command to Set Up or Modify a System Connection" (page 15) for complete details.

Contents of the vsstrace.reg File

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\VSS\Debug\Tracing]
"TraceFile"="c:\vsstrace.txt"
"TraceLevel"=dword:ffffffff
"TraceEnterExit"=dword:00000001
"TraceToFile"=dword:00000001
"TraceToDebugger"=dword:00000000
"TraceFileLineInfo"=dword:00000001
"TraceForceFlush"=dword:00000000
```

Application Event Log

This section describes how to view event logs associated with VSS Provider for Microsoft Windows, and how to interpret the VSS Provider messages that get posted through the Application Event Log in numerical order (Table 3 (page 21)).

NOTE: Only the English message catalog is currently supported.

To view the message from the Windows Application Event Viewer:

- For Windows 2003 perform the following:
  a. Click **Start**.
  b. Right-click **My Computer**.
  c. Click **Manage**.
  d. Expand on the **System Tools** tree node from the left panel.
  e. Click **Event**, and then **Application**.

  Result: The Application Event log appears on the right panel. (Figure 3 (page 21)).
- For Windows 2008 perform the following:
  a. Click **Start→Programs→Administrative Tools→Server Manager**.
  b. Expand on the **Diagnostics\Event Viewer\Windows Logs** tree node from the left panel.
  c. Click **Application**.

  Result: The Application Event log appears on the right panel (Figure 3 (page 21)).

Figure 3 Application Event Log on Windows 2003

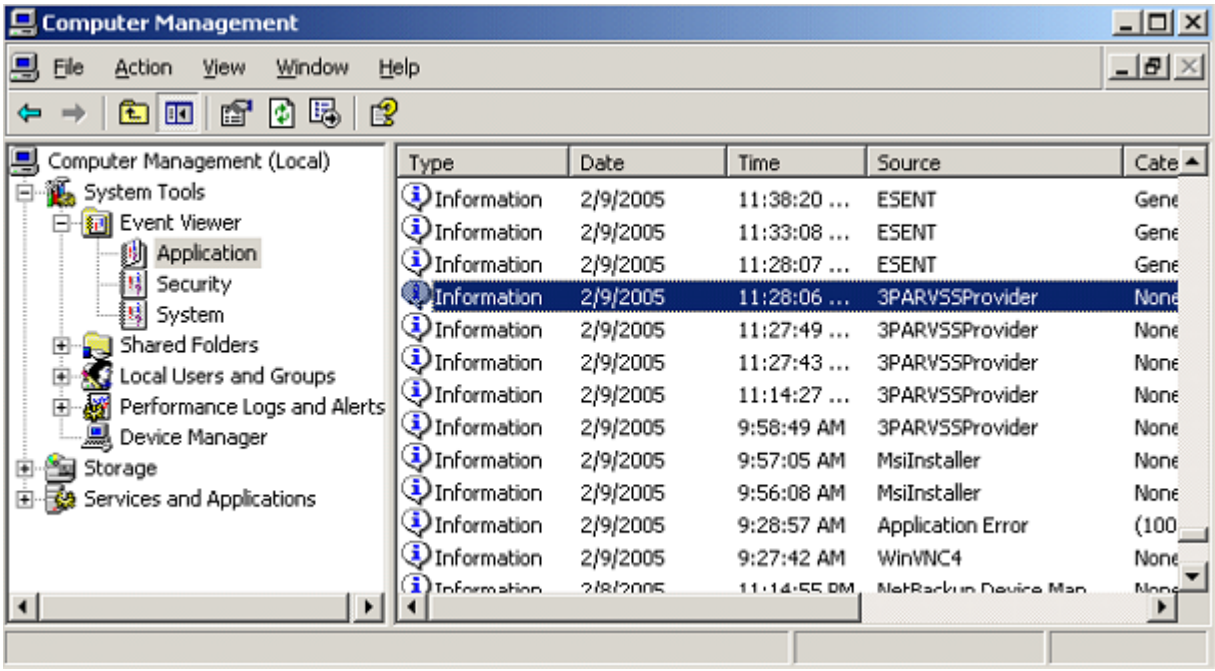


Table 3 (page 21) provides descriptions and actions for the various application events. The **Description** subsection for each message describes the problem. The **Action** subsection suggests possible solutions.

Table 3 Application Events

Event ID	Description	Action
5000	VSS Provider for Microsoft Windows `OnLoad` was successful. VSS Provider for Microsoft Windows has loaded the provider's DLL on demand. This message indicates VSS has invoked the VSS Provider for Microsoft Windows successfully.	None
5001	VSS Provider for Microsoft Windows `UnLoad` was successful. VSS Provider for Microsoft Windows loads the provider's DLL on demand, and releases it once the task has been completed. This	None

Table 3 Application Events *(continued)*

Event ID	Description	Action
	message indicates VSS has released the VSS Provider for Microsoft Windows from the VSS control.	
5020	Snapshot ID <*snapshot_ID*> prepared. Internal logging, <*snapshot_ID*>. is a unique identifier.	None
5040	SnapshotSet <*snapshot_set*> created. Indicates the SnapshotSet request has been fulfilled.	None
5041	Exec: <*message*> Internal logging, which records the task from the VSS Provider for Microsoft Windows to the HP 3PAR Storage System.	None
5042	Virtual Copy <*virtual_copy_number*> exported. A point-in-time snapshot disk has been created and exported to the host.	None
5043	Virtual Copy <*virtual_copy_ID*> removed. The exported snapshot disk has been removed from the host.	None
5050	Unsupported feature <*feature_ID*>. The VSS Provider for Microsoft Windows received an unsupported request through the VSS framework.	The request is unsupported by the current release. Contact your local service provider for a future release.
5051	A snapshot in one set has exceeded the maximum limitation. VSS Provider for Microsoft Windows supports up to 64 snapshots in one set. This request has exceeded the maximum limitation.	Reduce the number of snapshot requests in one snapshot set to less than 64, and request again.
5052	Could not allocate memory. Internal error, failed to allocate memory during computing.	Insufficient memory is available to allow VSS Provider for Microsoft Windows to operate normally. Shutdown some of the idle applications that are still running and resume the previously failed task.
5053	Could not communicate with InForm CLI. The initial check on the InForm CLI configuration has generated an error. This could mean several thing went wrong: • the InForm CLI is not installed. • A valid password file could not be found or its contents are not valid for this installation.	See "System Setup" (page 10), to check for CLI installation.
5054	<message> This is an error message that usually is associated with Event ID 5041. This event describes the cause to the action on Event ID 5041.	Correct the error and retry again, or contact your local service provider if the error continues.
5055	<*token_ID*>: Invalid token. Internal error. The output format does not match.	Set the LogLevel to '4' to show the detail error message to log file, and retry.
5056	Could not open the volume mapping file: <*mapping_file*>. Failed to open the mapping file that is generated by the `showvv -d` CLI command.	Set the LogLevel to '4' and look for vvmap as <*some_file_name*> from the `3parprov.log`.
5057	Could not open file: `<filename>` The VSS Provider for Microsoft Windows failed to open the temporary file <*filename*> that is generated internally.	Look for file `<filename>` to see the if the permissions are set correctly.

Table 3 Application Events *(continued)*

Event ID	Description	Action
5058	Could not create file *<filename>*. The VSS Provider for Microsoft Windows failed to open the temporary file *<filename>* which is generated internally.	Contact your local service provider with the detailed log file.
5059	Generic system error. This error message is generated by the system.	Try to correct the system error based on the message.
5061	IOCTL inquiry call failed. Failed on SCSI inquiry to the storage device through an IOCTL call.	Check the Window Disk Manager and the systemto verify that the device is active and functioning properly.
5062	Could not query the register key value for *<value_number>*. The VSS Provider for Microsoft Windows relies on the registry to store certain data for internal use, such as snapshot set ID, or the LogLevel to log the trace.	Check for the existence of the key name *<value_number>* from the register database.
5063	Could not query the register key name of *<key_name>*. The VSS Provider for Microsoft Windows relies on the registry to store certain data for internal use, such as snapshot set ID, or the LogLevel to log the trace.	Check for the existence of the key name *<key_name>* from the register database.
5064	Could not open the register key for VSS Provider for Microsoft Windows. Failed to open register key `[HKEY_LOCAL_MACHINE\SO FTWARE\3par\HWPRV]`	The registry key was created by the installer program during the VSS Provider for Microsoft Windows installation. Check to see if the installation was successful. If necessary, you may have to re-install the VSS Provider for Microsoft Windows.
5065	Target LUN *<LUN_number>* is not an HP 3PAR Virtual Volume. One of the snapshots from the snapshot set is not targeting a Virtual Volume. The VSS Provider for Microsoft Windows relies on the registry to store certain data for internal use, such as snapshot set ID, or the LogLevel to log the trace.	Move the data out from the non-HP 3PAR Virtual Volume to an HP 3PAR Virtual Volume, and perform the task again.
5066	The target LUN could not be identified. VSS Provider for Microsoft Windows failed to provide the information of the target LUN during the `AreLunsSupport()` interface.	Turn on VSS logging and reproduce the problem to collect VSS trace data for Microsoft Product Support Service.
5067	The destination LUN could not be identified. VSS Provider for Microsoft Windows failed to provide the information of the destination LUN from the interface.	Turn on VSS logging and reproduce the problem to collect VSS trace data for Microsoft Product Support Service.
5068	Could not retrieve device descriptor *<device_ID>*. Failed to retrieve device *<device_ID>* information.	Check both the Window Disk Manager and the system to see if the device is active and functioning properly.
5069	`DeviceIoControl` call failed. Internal error.	Set the LogLevel to '4' and reproduce the problem. Provide the `3parprov.log` file to your local service provider.
5070	The internal snapshot information is empty. This is an internal error. It is likely that the VSS Provider for Microsoft Windows could not find the mounted snapshot volume.	Set the LogLevel to '4' and reproduce the problem. Provide the `3parprov.log` file to your local service provider.