IBM TotalStorage SAN Volume Controller

Configuration Guide Supplement

Version 1.2.1 Supplement December 2004

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First Edition (December 2004)

Contents

About this guide

This guide provides errata information that pertains to *IBM TotalStorage SAN Volume Controller: Configuration Guide* version 1.2.1.

The SAN Volume Controller version 1.2.1 now provides support for the Microsoft Volume Shadow Copy service. This document provides instructions for installing and using the support for this service.

IBM TotalStorage support for Microsoft Volume Shadow Copy service

The SAN Volume Controller provides support for the Microsoft Volume Shadow Copy service. The Microsoft Volume Shadow Copy service can provide a point-in-time (″shadow″) copy of a Windows host volume while the volume is mounted and files are in use.

The following components make up the support for the service:
- SAN Volume Controller
- SAN Volume Controller master console
- IBM TotalStorage hardware provider, known as ″IBM TotalStorage Support for Microsoft Volume Shadow Copy Service″
- Microsoft Volume Shadow Copy service

The IBM TotalStorage hardware provider is installed on the Windows host.

To provide the point-in-time shadow copy, the components complete the following process:
1. A backup application on the Windows host initiates a snapshot backup.
2. The Volume Shadow Copy service notifies the IBM TotalStorage hardware provider that a copy is needed.
3. The SAN Volume Controller prepares volumes for a snapshot.
4. The Volume Shadow Copy service quiesces applications (the software applications that are writing data on the host) and flushes file system buffers to prepare for the copy.
5. The SAN Volume Controller makes the shadow copy with the FlashCopy Copy Service.
6. The Volume Shadow Copy service notifies the writing applications that I/O operations can resume, and it notifies the backup application that the backup was successful.

The Volume Shadow Copy service maintains a "free pool" of virtual disks (VDisks) for use as a FlashCopy target and a "reserved pool″ of (VDisks). These pools are implemented as virtual host systems in the SAN Volume Controller.

Installation overview

The steps for implementing the IBM TotalStorage Support for Microsoft Volume Shadow Copy Service must be completed in the correct sequence.

Before you begin, you must have experience with or knowledge of administering a Windows server operating system.

You must have experience with or knowledge of administering a SAN Volume Controller .

Complete the following tasks.
1. Verify that the system requirements are met.
2. If not previously installed, install the SAN Volume Controller master console.
3. Install the IBM TotalStorage hardware provider.
4. Verify the installation.
5. Create a free pool of volumes and a reserved pool of volumes on the SAN Volume Controller.

System requirements for the IBM TotalStorage support for Microsoft Volume Shadow Copy service

Ensure that your system satisfies the following requirements before you install the IBM TotalStorage hardware provider on a Windows Server 2003 operating system.

The following software is required:
- IBM TotalStorage Support for Microsoft Volume Shadow Copy Service version 2.3 or later.
- SAN Volume Controller version 1.2.1.0 or later with the FlashCopy feature enabled.
- SAN Volume Controller master console version 1.2.1.2 or later. You must install the master console *before* you install the IBM TotalStorage hardware provider.
- Windows Server 2003 operating system. The following editions of Windows Server 2003 are supported:
  - Standard Server Edition
  - Enterprise Edition, 32-bit version
  - Datacenter Edition, 32-bit version

Installing the IBM TotalStorage hardware provider

This section includes the steps to install the IBM TotalStorage hardware provider on a Windows server.

You must satisfy all of the prerequisites that are listed in the system requirements section before starting the installation.

During the installation, you will be prompted to enter information about the SAN Volume Controller master console, including the location of the truststore file. The truststore file is generated during the installation of the master console. You must copy this file to a location that is accessible to the IBM TotalStorage hardware provider on the Windows server.

When the installation is complete, the installation program might prompt you to restart the system.

Complete the following steps to install the IBM TotalStorage hardware provider on the Windows server.
1. Download the installation program files from the IBM Web site, and place a copy on the Windows server where you will install the IBM TotalStorage hardware provider.

2. Log on to the Windows server as an administrator, and navigate to the directory where the installation program is located.

3. Run the installation program by double-clicking **IBMVSS.exe**.

4. The Welcome window opens. Click **Next** to continue with the installation. You can click **Cancel** at any time to exit the installation. To move back to previous screens while using the wizard, click **Back**.
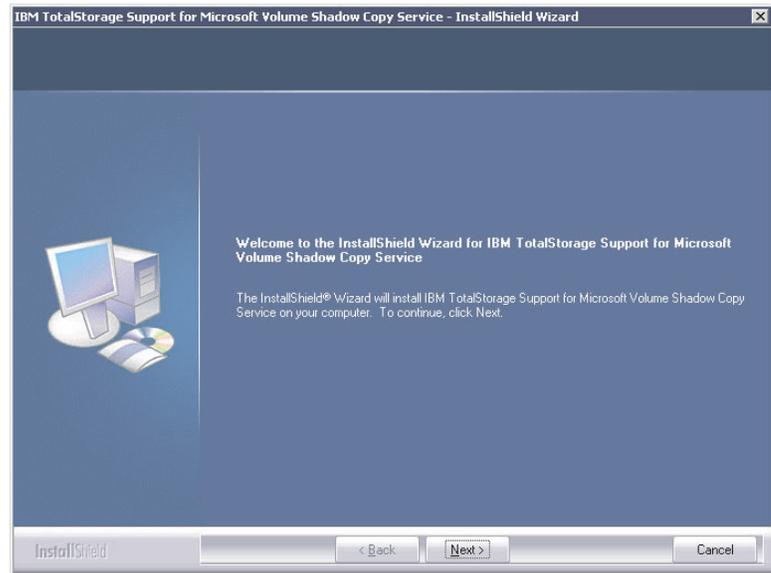
5. The License Agreement window opens. Read the license agreement information. Select whether you accept the terms of the license agreement, and click **Next**. If you do not accept, you cannot continue with the installation.
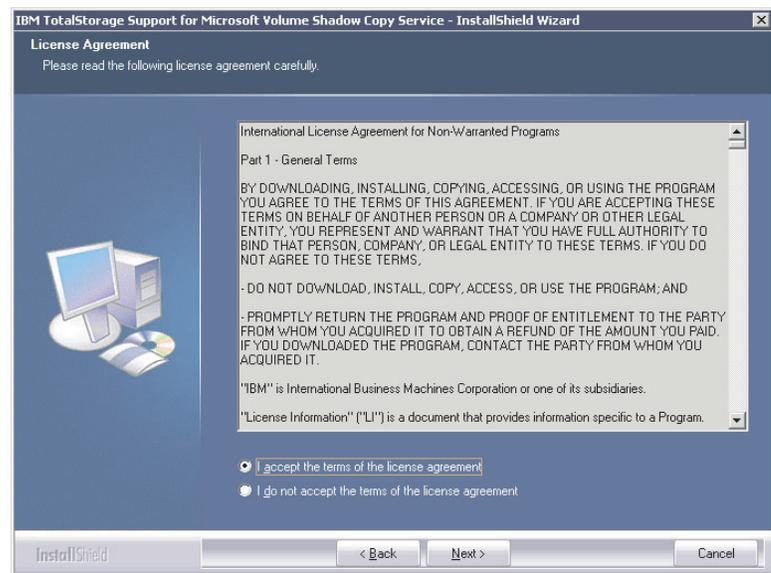
6. The Choose Destination Location Window opens. Click **Next** to accept the default directory where the setup program will install the files, or click **Change** to select a different directory. Click **Next**.
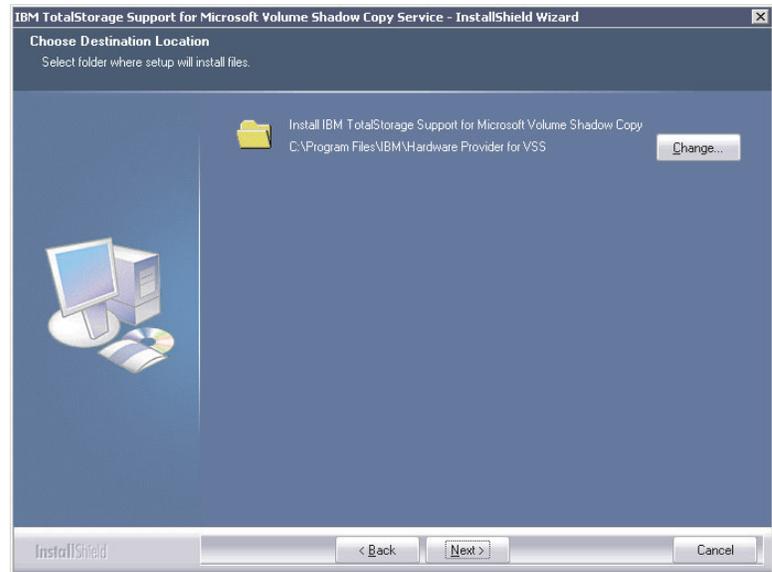
7. The Select Components window opens. Select **Volume Shadow Copy
   Service for SVC**. Click **Next**.
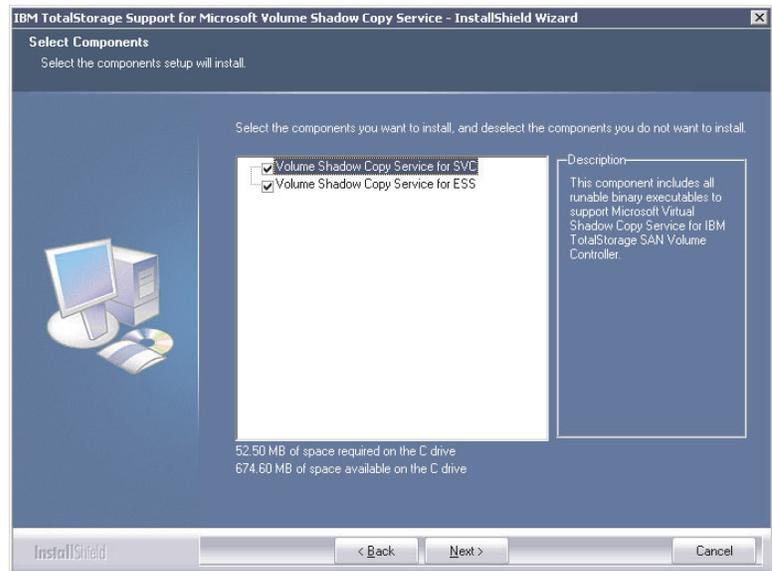
8. The Edit Data window opens.
   - In the **CIM Host** box, type the name of the server where the SAN Volume
     Controller master console is installed.
   - In the **CIM Port** box, type the port number of the master console. The
     default value is 5989.
   - In the **CIM User** box, type the user name that the IBM TotalStorage
     hardware provider will use to gain access to the master console.
   Click **Next**.
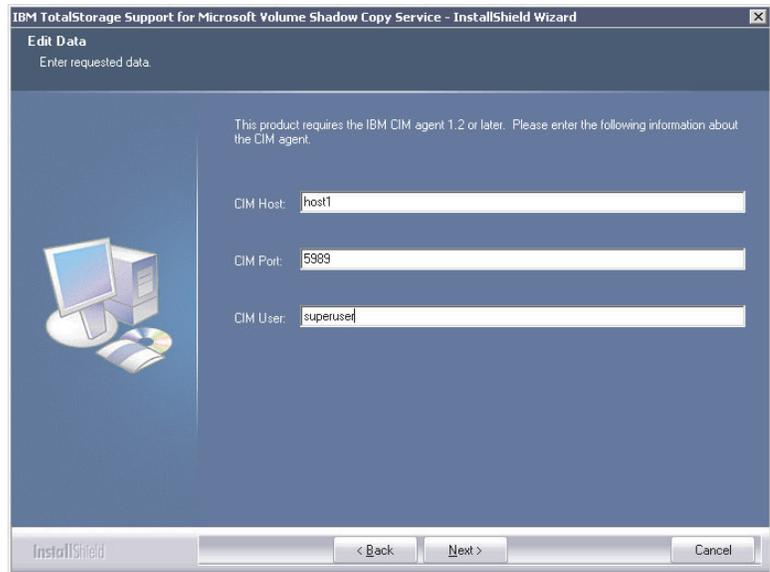
9. The Password window opens. Enter the password for the user name that the
   IBM TotalStorage hardware provider will use to gain access to the master
   console, and click **Next**.
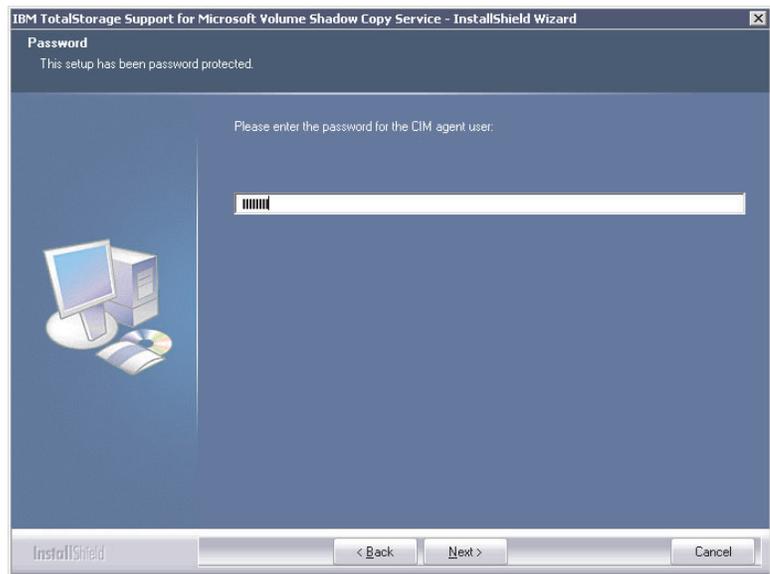
10. The Setup Type window opens. Select whether you want to use the Secure
    Sockets Layer (SSL) protocol to connect to the master console, and click **Next**.
    The default communication protocol for the master console is SSL.
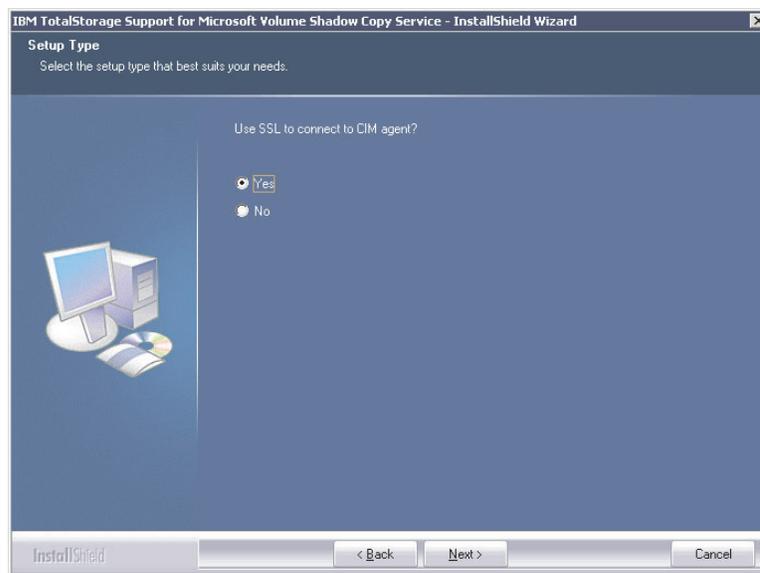
11. The Edit Data window opens.
    - In the **Truststore** box, enter the path to the master console truststore file.
    - In the **Trustpassword** box, enter the truststore password. The default truststore password is "ibmstore".

    Click **Next**.
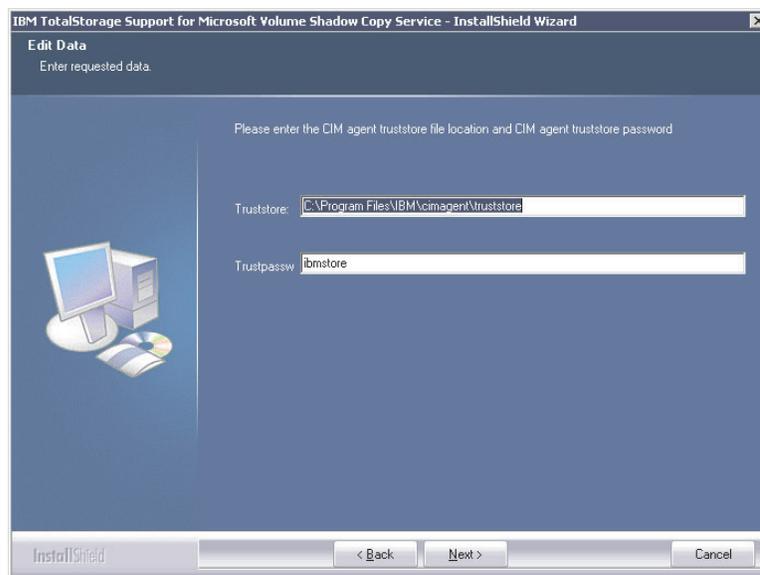
12. The Ready to Install the Program window opens. Click **Install** to begin the installation.
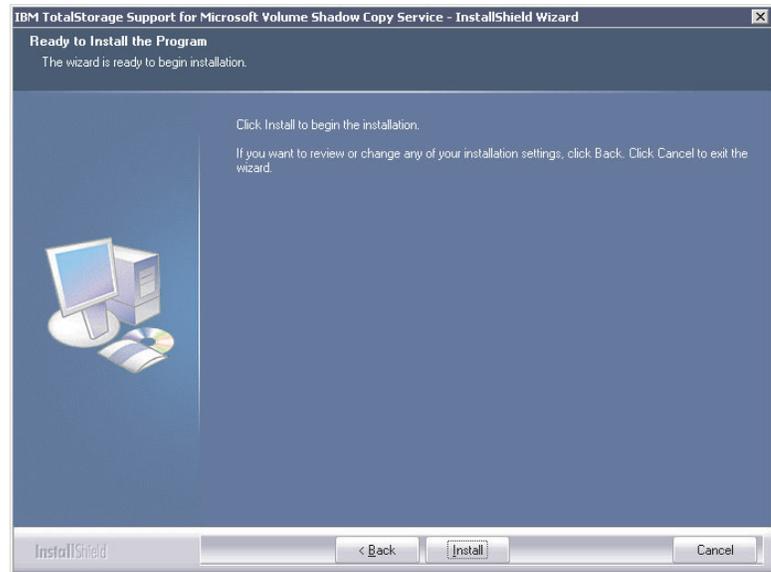
The Setup Status window opens. Wait for the setup to complete.

13. The InstallShield Wizard Complete window opens.

- If you are prompted to restart the system, you must restart the system to finish the installation.
  - Click **Yes**, and then click **Finish** to restart the system.
  - If you want to restart the system later, click **No**, and then click **Finish** to close the wizard.
- If you are not prompted to restart the system, click **Finish** to close the wizard.
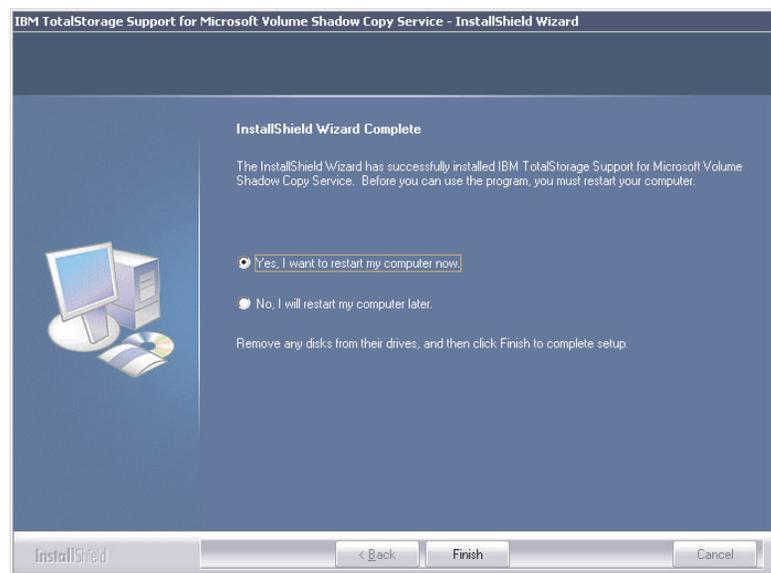
Verifying the installation

This task verifies that the IBM TotalStorage Support for Microsoft Volume Shadow Copy Service is correctly installed on the Windows server.

Perform the following steps to verify the installation.

1. On the Windows server on the **Start** menu, select **All Programs** -> **Administrative Tools** -> **Services**. The **Services** window opens.

2. Ensure that the service named ″IBM TotalStorage Support for Microsoft Volume Shadow Copy Service″ appears and that the Status is ″Started″ and the Startup Type is ″Automatic″.
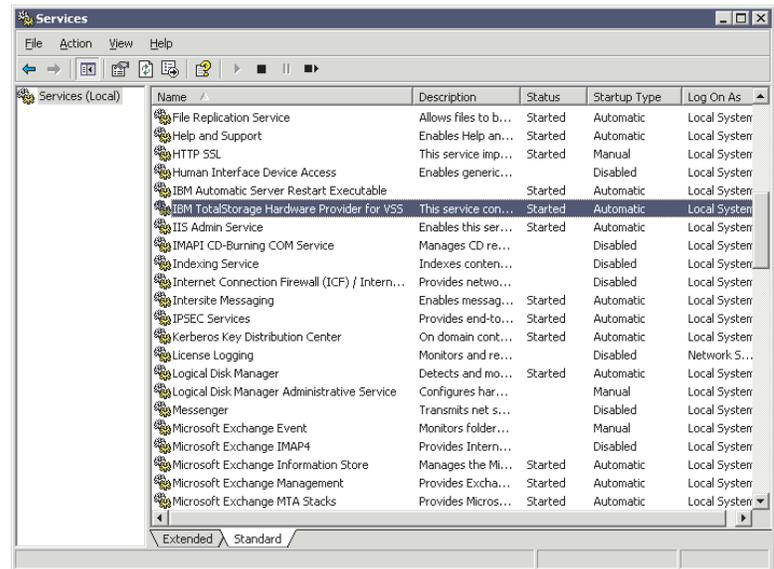
3. Open a command prompt window and type the following command:

   ```
   vssadmin list providers
   ```

   Ensure that the service named ″IBM TotalStorage Support for Microsoft Volume Shadow Copy Service″ is listed as a provider.

If you are able to perform all of these verification tasks successfully, then the IBM TotalStorage hardware provider was successfully installed on the Windows server.

Creating the free and reserved pools of volumes

The IBM TotalStorage hardware provider maintains a "free pool" of volumes and a "reserved pool″ of volumes. Because these objects do not exist in the SAN Volume Controller, the free and reserved pools are implemented as virtual host systems. You must define these two hosts on the SAN Volume Controller.

When a shadow copy is made, the IBM TotalStorage hardware provider selects a volume in the free pool, assigns it to the reserved pool, and then removes it from the free pool. This protects the volume from being overwritten by other Volume Shadow Copy Service users.

To successfully perform a Volume Shadow Copy Service operation, there must be enough VDisks mapped to the free pool. The VDisks must be the same size as the source VDisks.

Use the SAN Volume Controller master console or the SAN Volume Controller command-line interface to perform the following steps.

1. Create a host for the ″free pool″ of virtual disks.

- You can use the default name VSS_FREE or specify a different name.
- Associate the host with the worldwide port name 5000000000000000 (15 zeroes).

2. Create a virtual host for the ″reserved pool″ of volumes.
   - You can use the default name VSS_RESERVED or specify a different name.
   - Associate the host with the worldwide port name 5000000000000001 (14 zeroes).

3. Map the logical units (virtual disks, or VDisks) to the free pool of volumes.
   - If you already have VDisks created for the free pool of volumes, you must assign those VDisks to the free pool.
   - Any VDisk can be used.
   - The VDisks must not be mapped to any other hosts.

4. To add the VDisks to the free pool, create VDisk to host mappings between the VDisks selected in step 3 and the VSS_FREE host. Alternatively, you can use the ibmvcfg add command to add vdisks to the free pool.

5. Verify that the VDisks have been mapped. Use one of the following methods:
   - The SAN Volume Controller master console Viewing Virtual Disk-to-Host Mappings panel.
   - The SAN Volume Controller command-line interface `svcinfo lsvdiskhostmap` command.

   Verify that the VDisks are listed with the worldwide port names that they are assigned to.

If you do not use the default WWPNs 5000000000000000 and 5000000000000001, then you must configure the IBM TotalStorage hardware provider with the WWPNs.

Adding and removing VDisks

To perform the pool management tasks of adding, removing, and listing virtual disks (VDisks), you can use the SAN Volume Controller master console, the SAN Volume Controller command-line interface, or the utility ibmvcfg.exe.

The Microsoft Volume Shadow Copy service maintains a "free pool" of volumes and a "reserved pool″ of volumes. These pools are implemented as virtual host systems on the SAN Volume Controller.

Table 1 shows the ibmvcfg.exe commands for adding or removing volumes from the free pool of volumes.

Table 1. Pool management commands

Command	Description	Example
ibmvcfg listvols	Lists all VDisks, including information about size, location, and VDisk to host mappings.	`ibmvcfg listvols`
ibmvcfg listvols all	Lists all VDisks, including information about size, location, and VDisk to host mappings.	`ibmvcfg listvols all`
ibmvcfg listvols free	Lists the volumes that are currently in the free pool.	`ibmvcfg listvols free`

Table 1. Pool management commands (continued)

Command	Description	Example
ibmvcfg listvols unassigned	Lists the volumes that are currently not mapped to any hosts.	`ibmvcfg listvols unassigned`

ibmvcfg add -s <ipaddress>	Adds one or more volumes to the free pool of volumes. Use the -s parameter to specify the IP address of the SAN Volume Controller where the VDisks are located. The -s parameter overrides the default IP address that is set with the ibmvcfg set targetSVC command.	`ibmvcfg add vdisk12`
		
		`ibmvcfg add 600507`
		
		`68018700035000000`
		
		`0000000BA`
		
		`-s 66.150.210.141`

ibmvcfg rem -s <ipaddress>	Removes one or more volumes from the free pool of volumes. Use the -s parameter to specify the IP address of the SAN Volume Controller where the VDisks are located. The -s parameter overrides the default IP address that is set with the ibmvcfg set targetSVC command.	`ibmvcfg rem vdisk12`
		
		`ibmvcfg rem 600507`
		
		`68018700035000000`
		
		`0000000BA`
		
		`-s 66.150.210.141`

Configuration commands

After installation, you can change or correct the parameters that you defined when you installed the IBM TotalStorage hardware provider. To change the parameters, use the utility ibmvcfg.exe.

Table 2 shows the commands.

Table 2. Configuration commands

Command	Description	Example
ibmvcfg showcfg	Lists the current settings.	`ibmvcfg showcfg`
ibmvcfg set username <username>	Sets the user name to access the SAN Volume Controller master console.	`ibmvcfg set username johnny`
ibmvcfg set password <password>	Sets the password of the user name that will access the master console.	`ibmvcfg set password mypassword`

Table 2. Configuration commands (continued)

Command	Description	Example
ibmvcfg set targetSVC <ipaddress>	Specifies the IP address of the SAN Volume Controller on which the VDisks are located when VDisks are moved to and from the free pool with the ibmvcfg add and ibmvcfg rem commands. The IP address is overridden if you use the -s flag with the ibmvcfg add and ibmvcfg rem commands.	`set targetSVC` `64.157.185.191`
set backgroundCopy	Sets the background copy rate for FlashCopy.	`set backgroundCopy 80`
ibmvcfg set trustpassword <trustpassword>	Sets the password for the truststore file. The default value is `ibmstore`.	`ibmvcfg set trustpassword` `ibmstore`
ibmvcfg set truststore <path>	Specifies the truststore file location.	`ibmvcfg set truststore` `c:\truststore`
ibmvcfg set usingSSL	Specifies whether to use Secure Sockets Layer protocol to connect to the master console.	`ibmvcfg set usingSSL yes`
ibmvcfg set cimomPort <portnum>	Specifies the master console port number. The default value is 5989.	`ibmvcfg set cimomPort 5989`
ibmvcfg set cimomHost <server name>	Sets the name of the server where the master console is installed.	`ibmvcfg set cimomHost` `cimomserver`
ibmvcfg set namespace <namespace>	Specifies the namespace value that master console is using. The default value is `\root\ibm`.	`ibmvcfg set namespace` `\root\ibm`

ibmvcfg set vssFreeInitiator <WWPN>	Specifies the WWPN of the host. The default value is 5000000000000000. Modify this value only if there is a host already in your environment with a WWPN of 5000000000000000.	`ibmvcfg set`
		`vssFreeInitiator`
		`5000000000000000`

ibmvcfg set vssReservedInitiator <WWPN>	Specifies the WWPN of the host. The default value is 5000000000000001. Modify this value only if there is a host already in your environment with a WWPN of 5000000000000001.	`ibmvcfg set`
		`vssFreeInitiator`
		`5000000000000001`

Error codes

The IBM TotalStorage hardware provider for the Microsoft Volume Shadow Copy service logs errors in the Windows Event Monitor and in private log files.

Error messages can be viewed in the following locations on the Windows server where the IBM TotalStorage hardware provider is installed:

- The Windows Event Viewer in Application Events. Check this log first.
- The log file ibmVSS.log, which is located in the directory where the IBM TotalStorage hardware provider is installed.

Table 3 lists the errors that are reported by the IBM TotalStorage hardware provider.

Table 3. Error messages for the IBM TotalStorage hardware provider for the Microsoft Volume Shadow Copy services

Code	Message	Symbolic name
1000	JVM Creation failed.	ERR_JVM
1001	Class not found: %1.	ERR_CLASS_NOT_FOUND
1002	Some required parameters are missing.	ERR_MISSING_PARAMS
1003	Method not found: %1.	ERR_METHOD_NOT_FOUND
1004	A missing parameter is required. Use the configuration utility to set this parameter: %1.	ERR_REQUIRED_PARAM
1600	The recovery file could not be created.	ERR_RECOVERY_FILE_ CREATION_FAILED
1700	ibmGetLunInfo failed in AreLunsSupported.	ERR_ARELUNSSUPPORTED_ IBMGETLUNINFO
1800	ibmGetLunInfo failed in FillLunInfo.	ERR_FILLLUNINFO_IBMGETLUNINFO
1900	Failed to delete the following temp files: %1	ERR_GET_TGT_CLEANUP
2500	Error initializing log.	ERR_LOG_SETUP
2501	Unable to search for incomplete Shadow Copies. Windows Error: %1.	ERR_CLEANUP_LOCATE
2502	Unable to read incomplete Shadow Copy Set information from file: %1.	ERR_CLEANUP_READ
2503	Unable to cleanup snapshot stored in file: %1.	ERR_CLEANUP_SNAPSHOT
2504	Cleanup call failed with error: %1.	ERR_CLEANUP_FAILED
2505	Unable to open file: %1.	ERR_CLEANUP_OPEN
2506	Unable to create file: %1.	ERR_CLEANUP_CREATE
2507	HBA: Error loading hba library: %1.	ERR_HBAAPI_LOAD
3000	An exception occurred. Check the ESSService log.	ERR_ESSSERVICE_EXCEPTION
3001	Unable to initialize logging.	ERR_ESSSERVICE_LOGGING
3002	Unable to connect to the CIM agent. Check your configuration.	ERR_ESSSERVICE_CONNECT

Table 3. Error messages for the IBM TotalStorage hardware provider for the Microsoft Volume Shadow Copy services (continued)

Code	Message	Symbolic name
3003	Unable to get the Storage Configuration Service. Check your configuration.	ERR_ESSSERVICE_SCS
3004	An internal error occurred with the following information: %1.	ERR_ESSSERVICE_INTERNAL
3005	Unable to find the VSS_FREE controller.	ERR_ESSSERVICE_FREE_CONTROLLER
3006	Unable to find the VSS_RESERVED controller. Check your configuration.	ERR_ESSSERVICE_RESERVED_ CONTROLLER
3007	Unable to find suitable targets for all volumes.	ERR_ESSSERVICE_INSUFFICIENT_ TARGETS
3008	The assign operation failed. Check the CIM agent log for details.	ERR_ESSSERVICE_ASSIGN_FAILED
3009	The withdraw FlashCopy operation failed. Check the CIM agent log for details.	ERR_ESSSERVICE_WITHDRAW_ FAILED

Uninstalling the IBM TotalStorage hardware provider

Use Windows to uninstall the IBM TotalStorage hardware provider from the Windows server.

1. Log on to the Windows server as the local administrator.
2. On the **Start** menu, click **Control Panel**. The Control Panel window opens.
3. Double-click **Add or Remove Programs**. The Add or Remove Programs window opens.
4. Select **IBM TotalStorage Support for Microsoft Volume Shadow Copy Service**, and then click **Remove**.
5. When you are prompted to verify that you want to completely remove the program and all of its components, click **Yes**.
6. When the Finish window opens, click **Finish**. The removal is complete.