IBM System Storage N series
SnapManager 2.0 for Virtual Infrastructure Installation and Administration Guide

Contents

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About this guide

You can use your product more effectively when you understand this document's intended audience and the conventions that this document uses to present information.

This guide describes how to install, configure, and use SnapManager for Virtual Infrastructure (SnapManager for VI) and the Restore Agent.

Note: In this document, the term *gateway* describes IBM N series storage systems that have been ordered with gateway functionality. Gateways support various types of storage, and they are used with third-party disk storage systems—for example, disk storage systems from IBM, HP®, Hitachi Data Systems®, and EMC®. In this case, disk storage for customer data and the RAID controller functionality is provided by the back-end disk storage system. A gateway might also be used with disk storage expansion units specifically designed for the IBM N series models.

The term *filer* describes IBM N series storage systems that either contain internal disk storage or attach to disk storage expansion units specifically designed for the IBM N series storage systems. Filer storage systems do not support using third-party disk storage systems.

Next topics

Audience

This document is written with certain assumptions about your technical knowledge and experience.

It also assumes that you are familiar with the following topics:

- Knowledge of VMware virtual infrastructure products
- Knowledge of how Hypertext Transport Protocol over Secure Sockets Layer (HTTPS) is used for file sharing or transfers
- Knowledge of how block storage protocols, such as FCP and iSCSI, work with SAN storage
- Knowledge of how to perform a backup and restore a file on virtual machines
- Knowledge of how to provision storage on virtual machines

Supported features

IBM® System Storage™ N series storage systems are driven by NetApp® Data ONTAP® software. Some features described in the product software documentation are neither offered nor supported by IBM. Please contact your local IBM representative or reseller for further details. Information about supported features can also be found at the following Web site:

www.ibm.com/storage/support/nas/

A listing of currently available N series products and features can be found at the following Web site:

www.ibm.com/storage/nas/

Getting information, help, and services

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This section contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your IBM N series product, and whom to call for service, if it is necessary.

Next topics

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected properly.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation and use the diagnostic tools that come with your system.

Using the documentation

Information about N series hardware products is available in printed documents and a documentation CD that comes with your system. The same documentation is available as PDF files on the IBM NAS support Web site:

www.ibm.com/storage/support/nas/

Data ONTAP software publications are available as PDF files on the IBM NAS support Web site:

www.ibm.com/storage/support/nas/

Web sites

IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates.

- For NAS product information, go to the following Web site:
  www.ibm.com/storage/nas/
- For NAS support information, go to the following Web site:
  www.ibm.com/storage/support/nas/
- For AutoSupport information, go to the following Web site:
  www.ibm.com/storage/support/nas/
- For the latest version of publications, go to the following Web site:
  www.ibm.com/storage/support/nas/

Accessing online technical support

For online Technical Support for your IBM N series product, visit the following Web site:

www.ibm.com/storage/support/nas/

Hardware service and support

You can receive hardware service through IBM Integrated Technology Services. Visit the following Web site for support telephone numbers:

www.ibm.com/planetwide/

Supported servers and operating systems

IBM N series products attach to many servers and many operating systems. To determine the latest supported attachments, follow the link to the Interoperability Matrices from the following Web site:

www.ibm.com/storage/support/nas/

Firmware updates

As with all devices, it is recommended that you run the latest level of firmware, which can be downloaded by visiting the following Web site:

www.ibm.com/storage/support/nas/

Verify that the latest level of firmware is installed on your machine before contacting IBM for technical support. See the *Data ONTAP Upgrade Guide* for your version of Data ONTAP for more information on updating firmware.

Keyboard and formatting conventions

You can use your product more effectively when you understand how this document uses keyboard and formatting conventions to present information.

Keyboard conventions

Convention	What it means
The IBM NAS support site	Refers to *http://www.ibm.com/storage/support/nas/*.
Enter, *enter*	• Used to refer to the key that generates a carriage return; the key is named Return on some keyboards. • Used to mean pressing one or more keys on the keyboard and then pressing the Enter key, or clicking in a field in a graphical interface and then typing information into the field.
hyphen (-)	Used to separate individual keys. For example, Ctrl-D means holding down the Ctrl key while pressing the D key.
type	Used to mean pressing one or more keys on the keyboard.

Formatting conventions

Convention	What it means
Italic font	- Words or characters that require special attention. - Placeholders for information that you must supply. For example, if the guide says to enter the `arp -d hostname` command, you enter the characters "arp -d" followed by the actual name of the host. - Book titles in cross-references.
`Monospaced` font	- Command names, option names, keywords, and daemon names. - Information displayed on the system console or other computer monitors. - Contents of files. - File, path, and directory names.
`Bold monospaced` font	Words or characters you type. What you type is always shown in lowercase letters, unless your program is case-sensitive and uppercase letters are necessary for it to work properly.

Special messages

This document might contain the following types of messages to alert you to conditions that you need to be aware of.

Note: A note contains important information that helps you install or operate the system efficiently.

Attention: An attention notice contains instructions that you must follow to avoid a system crash, loss of data, or damage to the equipment.

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What SnapManager for Virtual Infrastructure is

SnapManager for Virtual Infrastructure provides rapid backup and restoration of VMware virtual machines and datastores whose active images reside on IBM storage systems running Data ONTAP. It also provides single file restore on a destination virtual machine.

Next topics

What you can do with SnapManager for Virtual Infrastructure

SnapManager for Virtual Infrastructure enables you to back up storage used by virtual infrastructures at datastore or virtual machine at the image- and file level, and then to restore the datastore, an individual virtual machine within the datastore, or a virtual machine disk file on a destination virtual machine. SnapManager for Virtual Infrastructure uses Snapshot technology to carry out backup, and can also utilize the SnapMirror technology to integrate an optional disaster recovery solution.

SnapManager for Virtual Infrastructure allows you to perform the following tasks:

- Carry out backup of virtual machine and datastore images residing on storage systems running the Data ONTAP software
- Schedule automated backup executions on one or more datastores or virtual machines
- Specify a retention policy for stored backups based either on a maximum time or a maximum number of backups
- Specify criteria for backup-related alert notification
- Support virtual machines and datastores that are located on either NFS directories or VMFS file systems
- Enable optional additional SnapMirror disaster recovery protection of your virtual machine and datastore images whenever you execute a backup
- Discover and display virtual machines and datastores created on the NFS file system
- Mount a backup to verify its content prior to restoration
- Restore backed up virtual machines or complete datastores
- Restore one or more files from a guest virtual machine disk (VMDK) without having to restore the entire virtual machine or VMDK

SnapManager for Virtual Infrastructure limitations

There are some limitations in SnapManager for Virtual Infrastructure.

- It does not support VMware Storage VMotion.
- It does not support initiating a multipath SnapMirror configuration from a backup. SnapManager 2.0 for Virtual Infrastructure does support a single-path SnapMirror initiation from a backup. If you want to use a multipath SnapMirror configuration along with SnapManager for Virtual Infrastructure, ensure that the SnapMirror process occurs on a frequent schedule and from the storage system rather than from within SnapManager for Virtual Infrastructure to initiate a SnapMirror process.
- It does not back up traditional volumes (it backs up FlexVol® volumes).
- It does not back up or restore RDM (raw device mapping) LUNs or iSCSI LUNs connected to Windows® virtual machines via Microsoft iSCSI Software Initiator.
- It does not support restoration of a virtual machine to a datastore that was not the virtual machine's container at the time of backup.
- It does not display newly created VMFS datastores unless the storage system volumes on which those datastores reside are rescanned from the VMware® vCenter server and the SnapManager for Virtual Infrastructure backup window is refreshed.
- It does not restore a virtual machine that spans three or more VMFS datastores.
- It does not restore a datastore that has been removed from the vCenter server after backup.
- It does not support multiple SnapManager for Virtual Infrastructure servers providing backup for the same vCenter server.
- It does not clean up an existing igroup when a LUN is unmounted and reuse it for future mounts. If there are no mounted backups and there are no VMFS-based virtual machine restore processes running, you can manually delete the igroup.
- It cannot take VMware snapshots of Windows virtual machines that have iSCSI LUNs connected via Microsoft iSCSI Software Initiator, or NPIV RDM LUNs. See VMware KB article 1009073 for more details, at the following Web site:
  http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=1009073

Components included with SnapManager for Virtual Infrastructure

The SnapManager for Virtual Infrastructure software installation file includes the SnapManager for Virtual Infrastructure server, a graphical user interface, a command-line interface, and the Restore Agent installation file.

SnapManager for Virtual Infrastructure server	You can deploy the software server locally on the same machine running the vCenter Server or on any machine running a supported version of the Windows operating system.
SnapManager for Virtual Infrastructure GUI	This user interface enables you to manage virtual machines and datastores that reside within your virtual infrastructure environment. It allows you to configure and schedule backup jobs, carry out manual backups, rename backups, mount and unmount backups on an ESX server for viewing prior to restoration, and restore a virtual machine or datastore from that backup.
SnapManager for Virtual Infrastructure CLI	This command-line interface to administer the SnapManager for Virtual Infrastructure server also enables you to manage virtual machines and datastores that reside within your virtual infrastructure environment. The CLI allows you to create a new user (if necessary to access both the SnapManager for Virtual Infrastructure server and the vCenter Server with one login name), initiate a backup, find a backup to restore, mount and unmount a backup, rename a backup, and restore a virtual machine or datastore from a backup.
Restore Agent	This Microsoft Management Console (MMC) snap-in application has built-in support for Windows file systems. It works with SMVI, by requesting disk attach and detach operations, and the Windows operating system to manage the attached disk's mount point.

Components not included with SnapManager for Virtual Infrastructure

These components work with SnapManager for Virtual Infrastructure but are not included with the SnapManager for Virtual Infrastructure installation file.

Storage systems using Data ONTAP	SnapManager for VI provides backup support for datastores and virtual machines whose active images reside on storage systems using Data ONTAP located in either SAN (VMFS over LUNs) or NAS environments.

SnapMirror source and target systems (optional)

If you want to support SnapManager for Virtual Infrastructure backup plus mirroring, you must configure SnapMirror on your storage systems.

- The storage systems on which the active datastore and virtual machine images reside must be configured as SnapMirror source systems.

- The storage systems to which you want to mirror those backup copies must be configured as the SnapMirror target systems.

VMware vSphere

You use this management software to create your VMware datastores and virtual machines and to configure the storage system volumes as the containers in which your active datastore and virtual machine images reside. This software suite consists of the following:

VMware agents   These are software modules installed on an ESX server to carry out VC server requests.

vCenter Server   The VC server communicates with VMware agents on an ESX server.

vSphere client   This GUI client is used to manage the VC server.

ESX host

This enterprise-level product integrates server processes, storage functionality, and networking resources into multiple virtual systems. In the SnapManager for VI documentation, the term ESX host refers to a physical host running an ESX host hypervisor OS.

SnapManager for Virtual Infrastructure installation and upgrade

You should familiarize yourself with the system and configuration requirements before downloading and installing SnapManager for Virtual Infrastructure.

Next topics

Windows host requirements

You can install and run all of the SnapManager for VI software components on the same Windows host system. You can also install the two user interfaces (CLI and GUI) on different host systems as long as they are in the same domain as the SnapManager for VI server. Each Windows host must meet minimum hardware and OS requirements.

Operating system requirements

SnapManager for VI supports the following Windows OS platforms:

- Windows 2003
- Windows XP
- Windows 2008
- Windows Vista

Minimum hardware requirements

Hardware function	Requirement
Memory	• 512 MB of RAM • 1 GB of RAM if all SnapManager for VI components and the VC server are on the same host
CPU	1.0 GHz processor speed
Disk space	500 MB
Temporary disk space for installation	1.2 GB

SnapManager for Virtual Infrastructure requirements

SnapManager for Virtual Infrastructure supports specific VMware versions.

VMware Virtual Infrastructure 3

- VMware ESX 3.5 Update 4
- VMware ESXi 3.5 Update 4
- VMware VirtualCenter 2.5 Update 4

VMware vSphere 4

- VMware ESX 4
- VMware ESXi 4
- vCenter Server 4

Storage system requirements

SnapManager for VI requires the data storage systems where the datastore or virtual machine images reside to run the Data ONTAP storage software. These storage systems can be either Data ONTAP-specific physical storage systems or vFiler units.

Type of storage system	Requirements
Physical storage system	• Data ONTAP 7.2.x or 7.3.x • SnapRestore licensed

Type of storage system	Requirements
vFiler unit	• Data ONTAP 7.2.4 (and above) or 7.3.x • SnapRestore licensed **Note:** vFiler supports iSCSI but not FC protocol. In addition, a vFiler unit only supports LUNs created for VMFS datastores with multiprotocol type VMware.

Backup requirements

Your datastore and virtual machines must meet the following requirements before you can install SnapManager for Virtual Infrastructure.

- vSphere and vCenter Server are installed to configure and manage an ESX host.
- Through the vCenter client configuration, the ESX host's active datastore and virtual machine images reside on volumes or qtrees on one or more storage systems.

  Note: See vSphere and vCenter Server documentation for details on configuring datastore and virtual machine images to reside on storage volumes.

- Snapshot protection is enabled in the volumes where those datastore and virtual machine images reside.
- SnapRestore is licensed for the storage systems where those datastore and virtual machine images reside.

SnapMirror requirements

Optional SnapMirror protection requires these conditions prior to SnapManager for Virtual Infrastructure installation.

- A SnapMirror license is installed on the storage systems on which the ESX host's active datastore and virtual machine images reside.
- The volumes containing the active datastore and virtual machine images are configured as SnapMirror source volumes.
- These source volumes have a SnapMirror relationship with target volumes on a second SnapMirror-licensed storage system that is located a safe distance from the source storage system.
- The host names and IP address of the SnapMirror source and destination storage systems must be resolvable for the SnapManager for Virtual Infrastructure server, either through a configured DNS

server or through host entries added to the host file on the SnapManager for Virtual Infrastructure server.

The usual path location to the host file on Windows XP or Vista operating systems is `Windows_dir\system32\drivers\etc\host`.

Installing or upgrading SnapManager for Virtual Infrastructure

You can install or upgrade SnapManager for Virtual Infrastructure on host systems running Windows Server 2003, Windows XP, Windows 2008, and Vista.

Before you begin

- Make sure that the host you want to install SnapManager for Virtual Infrastructure on meets all the Windows host requirements.
- Download the SnapManager for Virtual Infrastructure installation file from the IBM NAS support site to your Windows host, or insert the install CD.

About this task

You can choose from three types of installation:

- Full installation (SnapManager for Virtual Infrastructure server, GUI, and CLI)
- GUI and CLI (for remote GUI and CLI installations)
- CLI only (for remote CLI installations)

Steps

1. Navigate to the location where you downloaded the SnapManager for Virtual Infrastructure installation file.
2. Run the installation file.

If...	Then...
You are installing on a Windows Server 2003 or Windows XP host	Double-click the installation file icon.
You are installing on a Windows 2008 or Vista host	Right-click the installation file icon and select the **Run as administrator** option, then select **Allow** in the **User Account Control** dialog box.

The SnapManager for Virtual Infrastructure InstallShield wizard launches.

3. Proceed through the Installshield wizard to complete the installation.

After you finish

If you are installing on a Windows 2008 or Vista host, you must specifically configure SnapManager for Virtual Infrastructure to run with Administrator rights.

Next topics

Enabling the SnapManager for Virtual Infrastructure service to run with Administrator rights

If you are installing on a Windows 2008 or Vista host, you must specifically enable the SnapManager for Virtual Infrastructure service to run with Administrator rights.

Steps

1. From the Start menu, navigate to **All Programs > Administrative Tools > Services**.

    Note: If you see the **User Account Control** window prompt for permission to run the Microsoft Management Console application, select **Continue**.

    The **Services** window lists all installed Windows services.

2. In the list of services, right-click **SnapManager VI service** and select **Stop**.

    The SnapManager for Virtual Infrastructure service stops.

3. Right-click **SnapManager VI service** again and select **Properties**.
4. In the **Properties** window, click the **Log On** tab. When prompted for log on option, select **This account**.
5. Enter either Administrator or the name of the user who is a member of the administrators group.

    Note: You can also use Browse button to look up user names.

6. Type the password of the user in the Password box and in the Confirm password box, and then click **OK**.

    Note: If you see a window saying that user has been granted Log On As A Service right, click **OK**.

7. Right-click **SnapManager VI service** again and select **Start**.

    The SnapManager for Virtual Infrastructure service starts and is now configured to run with Administrator rights.

Configuring the SnapManager for Virtual Infrastructure shortcuts to run with Administrator rights

If you are installing on a Windows 2008 or Vista host, you must specfically configure the SnapManager for Virtual Infrastructure Desktop and Start menu shortcuts to run with Administrator rights.

Steps

1. To configure your Desktop shortcuts to start SnapManager for Virtual Infrastructure with Administrator rights, minimize all windows so that you can access the shortcuts on the desktop.
2. On the desktop, right-click the **smvi cli** shortcut and select **Properties**.
3. In the Properties window, click **Advanced** and select the **Run as administrator** check box.
4. Click **OK** to close both windows.
5. On the desktop, right-click the **smvi gui** shortcut and select **Properties**.
6. In the Properties window, click **Advanced** and select the **Run as administrator** check box.
7. Click **OK** to close both windows.
8. To enable the SnapManager for Virtual Infrastructure Start menu shortcuts to start SnapManager for Virtual Infrastructure with Administrator rights, navigate to **Start > All Programs > IBM**.
9. In the Properties window, click **Advanced** and select the **Run as administrator** check box.
10. Click **OK** to close both windows.
11. Right-click the **smvi gui** shortcut and select **Properties**.
12. In the Properties window, click **Advanced** and select the **Run as administrator** check box.
13. Click **OK** to close both windows.

Uninstalling SnapManager for Virtual Infrastructure

You can use the Windows Control Panel on your host system to uninstall SnapManager for Virtual Infrastructure.

Steps

1. Open the Windows Control Panel on your host system.
2. From the Control Panel, run the Windows program management utility.

If...	Then...
You are using Windows 2003 or Windows XP	Double-click **Add or Remove Programs**.
You are using Windows 2008 or Vista	Double-click **Programs and Features**.

3. In the list of programs, select SnapManager for VI and click **Remove**.
4. Click **Next** to uninstall SnapManager for Virtual Infrastructure.

5. Optionally delete SnapManager for Virtual Infrastructure metadata.

Uninstalling SnapManager for Virtual Infrastructure does not automatically remove created metadata. If you want to remove created metadata, delete the following files:

- `Program Files\IBM\SMVI\server\etc\Cred`
  This file contains encrypted information about both IBM storage systems (host, user name, and password) and VirtualCenters (host, user name and password).
- `Program Files\IBM\SMVI\server\repository\backups.xml`
  This file contains information about what you backed up. You can save it to find and then restore a datastore or virtual machine from one or more backups earlier.
- `Program Files\IBM\SMVI\server\repository\mounts.xml`
  This file contains information about the backups that were mounted. If this file indicates that a backup is still mounted, then you must unmount it. Otherwise, you will have copies of your data that are still in use within VMware and IBM storage systems.
- `Program Files\IBM\SMVI\server\repository\scheduleBackups.xml`
  This file contains information about the scheduled backup jobs that have been created for use within SnapManager for Virtual Infrastructure.

You can also safely remove any other directory or file remaining in the installation directory after the uninstall process is complete.

Reinstalling SnapManager for Virtual Infrastructure

You might need to reinstall SnapManager for Virtual Infrastructure if you accidentally remove the destination folder or delete a file within the destination folder.

Steps

1. Navigate to the location of the installation file. This file was either downloaded from the IBM NAS support site or resides on the SnapManager for VI CD.

2. Run the installation file.

The InstallShield wizard launches.

3. Select **Reinstall** and click **Next**.

4. Proceed through the Installshield wizard to complete the installation.

Note: You can select to reinstall all existing components or select separate components to reinstall. If you reinstall separate components, any component that you selected not to reinstall is removed when the reinstallation of the selected components is carried out. For example, if you select to reinstall the CLI but not the SnapManager for Virtual Infrastructure server and GUI, the reinstallation procedure removes the server and the GUI and installs only the SnapManager for Virtual Infrastructure CLI.

Installation and configuration workflow

To add SnapManager for Virtual Infrastructure backup capability to a VMware vSphere system, install and configure the SnapManager for Virtual Infrastructure server and its client GUI.

SnapManager for Virtual Infrastructure configuration

Before you begin using SnapManager for Virtual Infrastructure to schedule backups and restore your datastores, virtual machines, and virtual disk files, you should configure the vCenter Server, storage systems, and user authentication.

Next topics

SnapManager for Virtual Infrastructure authentication methods

SnapManager for Virtual Infrastructure provides two authentication methods to determine if you have the proper user credentials to access the SnapManager for Virtual Infrastructure server.

The default authentication method allows you to use your Windows authentication credentials to log in to the SnapManager for Virtual Infrastructure server. However, you can also override the default authentication method by creating a custom user through the CLI, allowing you to log in with authentication credentials other than your Windows credentials.

Creating custom users

If you don't want to use your Windows authentication credentials to login to the SnapManager for Virtual Infrastructure server, you can use the CLI to create a custom user. The credentials of a custom user provide the same access to commands and features as an administrator who logs in using the default Windows credentials authentication method.

Steps

1. Double-click the **smvi cli** desktop icon or navigate to **Start > All Programs > IBM**.
2. Enter the `smvi servercredential set` command.
3. Enter a user name.
4. Enter a password.

5. Restart the SnapManager for Virtual Infrastructure server service by navigating to **All Programs > Administrative Tools > Services**, right-clicking **SnapManager VI service** in the list of services, and selecting **Start**.

After you finish

If you create a custom SnapManager for Virtual Infrastructure server user, then you must also set the vCenter Server credentials through the CLI. If you do not do this, the user cannot run any command that requires communication with the vCenter Server.

Launching the SnapManager for Virtual Infrastructure GUI

You can launch the SnapManager for Virtual Infrastructure GUI by using the desktop shortcut or the Windows Start menu.

Steps

1. Double-click the **smvi gui** desktop icon or navigate to **Start > All Programs > IBM > smvi GUI**.
2. Enter the IP address or domain name of the SnapManager for Virtual Infrastructure server.

    Note: If the SnapManager for Virtual Infrastructure client and server are installed on the same PC, leave the Server field blank.

3. Enter your user name.

    Note: Use either your Windows user credentials or your custom SnapManager for Virtual Infrastructure user credentials if you created a custom user.

4. Enter your password.
5. Optionally, click **Options** and enter the port information of the SnapManager for Virtual Infrastructure server.
6. Click **Connect**.

Adding a vCenter Server

Since the SnapManager for Virtual Infrastructure server communicates directly with a vCenter Server via HTTPS to discover the data centers and datastores within your virtual environment, you must add a vCenter Server in SnapManager for Virtual Infrastructure.

About this task

    Note: You can only connect to one vCenter Server.

Steps

1. Launch and log in to the SnapManager for Virtual Infrastructure GUI.
2. Click **Set up** in the navigation pane.
3. Click **Edit** in the **Basic** tab of the **Setup** window.
4. If you want, you can change the vCenter Server from the default value to another IP address or domain name of a vCenter Server.

   If you do not supply a vCenter Server, SMVI adds localhost as the default value.

5. Type the port number of the vCenter Server in the dialog box.
6. Click **OK**.

Adding storage systems

After you specify a vCenter Server and set up your user credentials, you can add the physical storage systems on which the active images of the datastores and virtual machines that are managed by that vCenter Server reside.

About this task

Adding your storage systems allows SnapManager for Virtual Infrastructure to discover those datastore and virtual machine entities so that you can create backups of them. SnapManager for Virtual Infrastructure server and storage systems communicate using either HTTP or HTTPS.

> **Note:** You must delete and re-add a storage system if its IP address changes.

Steps

1. Launch and log in to the SnapManager for Virtual Infrastructure GUI.
2. Click **Set up** in the navigation pane.
3. In the Storage Systems pane of the **Setup** window, click **Add**.
4. In the **Add Storage System** dialog box, type the DNS name or IP address of the storage system on which the active images of the datastore or virtual machine entities managed by the current vCenter Server reside.
5. In the **Add Storage System** dialog box, type the name and password that allows you to communicate with the storage system.
6. Click **OK**.

After you finish

If you intend to initiate a SnapMirror update during a backup procedure, you must also add a destination storage system at this time.

Next topics

Custom user accounts for accessing a storage system

A nonroot or nonadministrator account might be required for SnapManager for Virtual Infrastructure to access a specific storage system.

In this case, you must create a custom storage system account with a new storage system role, group, and user as described in the following table.

Item	Description
Role	The new role must allow SnapManager for Virtual Infrastructure to access the storage system data through its APIs.
Group	A storage system maintains groups as a collection of roles. The group you create must contain your new role.
User	A user account that SnapManager for Virtual Infrastructure uses to access a storage system must be a member of a group that contains a role.You can create this user and assign a password to it, then you are able to add a storage system to SnapManager for Virtual Infrastructure with the assigned user name and password.

For more information on how to manage users on your storage system, refer to your storage system's administrator guide.

Creating a custom storage system user account

You can use your storage system's CLI to create a custom storage system account with a new storage system role, group, and user.

About this task

Perform the following steps from the CLI of the storage system that SnapManager for Virtual Infrastructure needs to access.

Steps

1. Use the following command to create a role named api-access with the minimum configuration required for SnapManager for Virtual Infrastructure to access the storage system.

   useradmin role add api-access -a api-*,login-http-admin,cli-ifconfig

2. Use the following command to create a group named api-group which contains the api-access role.

```
useradmin group add api-group -r api-access
```

3. Use the following command to create a user named smvi-user as a member of the api-group group.

```
useradmin user add smvi-user -g api-group
```

4. To set the user's password, run the `passwd` command as root.

   The storage system prompts you for the account name that you want to change, followed by the new password for this account.

Deleting a storage system

You can delete a storage system fromSnapManager for Virtual Infrastructure if you are no longer using it to create backups of a datastore and virtual machineYou must also delete and re-add a storage system if its IP address changes.

Steps

1. Launch and log in to the SnapManager for Virtual Infrastructure GUI.
2. Click **Set up** in the navigation pane.
3. In the **Setup** window, select one or more storage systems that you want to delete.
4. Click **Delete**, then click **Yes** on the confirmation prompt.

Updating authentication credentials for a storage system

When a storage system administrator's user credentials change, you must update the information in SnapManager for Virtual Infrastructure.

Steps

1. Launch and log in to the SnapManager for Virtual Infrastructure GUI.
2. Click **Set up** in the navigation pane.
3. In the **Setup** window, select a storage system to update the user credentials.
4. Click **Edit**.
5. Specify a new user name and password for this storage system and click **OK** to modify the user credentials.

Scheduling and managing backup jobs

You can create or schedule a backup job using the **Add Job** wizard. After you to create a backup job, you can set a schedule for the backup instead of performing a manual backup.

Next topics

Decisions to make before creating a backup job

Before you use the **Add Job** wizard to create, schedule, and thereby automate backups, you must make some decisions about what you want to back up, the backup schedule, the backup retention policy, and how you want to be notified of backup activity.

Entities

Entities	What datastores and virtual machines do you want to use for the new configuration? • Selecting the data center name displays all datastores contained in that data center in the Available entities list. • Selecting a datastore displays all virtual machines that are part of that datastore in the Available entities list.
Available entities	What datastores or virtual machines do you want to assign to this backup job? The selected entities, displayed in the Selected entities box, will be assigned to this backup job. **Note:** Click the >> button if you want to select all the datastores or virtual machines in the Available entities list.

Note: Click the < button to unassign the virtual machine or datastore from a backup job, select a virtual machine or datastore name in the Selected entities box.

SnapMirror update	Do you want to start a SnapMirror update on the selected entities concurrent with every backup? If so, select the Initiate SnapMirror Update check box. **Note:** For this option to execute successfully, the selected entities must reside in volumes that are already completely configured as SnapMirror source volumes. The SMVI server should be able to resolve the host name and IP address of the source and destination storage systems in the snapmirror.conf file.
Backup Script	Do you want to run a backup script that is installed on the SMVI server with this job? If so, you can select a list of scripts from the Available scripts list. **Note:** The default timeout for backup scripts is 30 minutes. If you need to change the default timeout, you must add a new entry to the smvi.override configuration file. Add the smvi.script.timeout.seconds=<number of seconds> entry to the file. After you add this entry, you must restart the SMVI server for this change to take effect.
Backup Schedule	What is the Hourly, Daily, Weekly, or Monthly schedule that you want applied to your backup job? If you configure an Hourly backup schedule, specify intervals of either 1, 2, 3, 4, 6, 8, 12, or 24 hours between backups to ensure that your backups occur at the same time from one day to the next. Specifying any other interval causes your backup times to shift from one day to the next. Select None to create a backup job without attaching a schedule. **Note:** If you select None, you also have the option to delete the job as soon as it is created if you check the Delete this job check box. The job is not saved and it does not appear in the backup jobs list.
User Credentials	What is the user name and password of to use for the vCenter server that you want to communicate with? These credentials are used to authenticate both the SnapManager for Virtual Infrastructure server and the vCenter server.
Backup Retention	What is the maximum number of days, maximum number of backups, or backup indefinitely to retain your job?

Alert Notifications	Who do you want to send e-mails notifying them of this job?

- One source e-mail address. In most cases this is the address of the administrator who is configuring this backup job.
- One or more e-mail addresses to which to send alert notifications.
- The address of the SMTP server from which to send the alerts
- The alert level for when to send notifications (Always, Errors or Warnings, Errors, or Never)

> **Note:** Select Never to continue without specifying any e-mail addresses.

You can specify multiple e-mail addresses by typing them in a semicolon-separated list.

Related tasks

What backup metadata is

Backup metadata provides information that is required to utilize Snapshots created by the SMVI server.

It is necessary for protecting this data against corruption and for maintaining long-term backups. The metadata repository must be capable of crash recovery.

Creating a backup job

You can use the **Add Job** wizard to create a new configuration that schedules and automates your backups, enforces a retention policy, enforces an automated alert notfication policy, and can be applied to multiple datastore and virtual machine entities.

Steps

1. Launch and log in to the SnapManager for Virtual Infrastructure GUI.
2. Click **Backup** in the navigation pane. to open the **Schedule Backup Jobs** window.
3. Click **Add** to start the **Add Job** wizard.
4. Type a backup job name and description and click **Next**.
5. Type or select information as requested by the wizard.
6. Review the summary page and click **Finish**.

Select the Run backup now check box to immediately run the job.

Scheduling a backup job

You can use the **Schedule** tab of the **Job Properties** dialog box to create a schedule for an existing backup job.

Steps

1. Launch and log in to the SnapManager for Virtual Infrastructure GUI.
2. Click **Backup** in the navigation pane.
3. In the **Schedule Backup Jobs** window, select the backup job to which you want to attach a schedule.
4. Click **Edit**, then click the **Schedule** tab.
5. Select the type of schedule (Hourly, Daily, Weekly, or Monthly) that you want to configure for this backup job and click **Apply** to create the schedule.

   Note: During a backup or restore operation on a virtual machine, SnapManager for VI does not allow other backup or restore operations on that virtual machine to start. SMVI delays any backup or restore operations until an ongoing backup or restore operation is complete.

Editing a backup schedule

You can use the **Job Properties** dialog box to modify the schedule of an existing backup job.

Steps

1. Launch and log in to the SnapManager for Virtual Infrastructure GUI.
2. Click **Backup** in the navigation pane.
3. In the **Schedule Backup Jobs** window, select the backup job that you want to edit.
4. Click **Edit**, then click the **Schedule** tab.
5. Select a new schedule for this backup job and click **Apply** to modify the schedule.

Changing backup job properties

You can use the **Job Properties** dialog box to change the name and description, the datastores and virtual machines that are assigned, the backup scripts, the user credentials, the retention policy, or the alert notifications for an existing backup job.

Steps

1. Launch and log in to the SnapManager for Virtual Infrastructure GUI.
2. Click **Backup** in the navigation pane.
3. In the **Schedule Backup Jobs** window, select the backup job whose properties you want to modify.
4. Click **Edit**, then click the appropriate tab for the properties that you want to edit for this backup job.
5. Modify the backup job properties as needed and click **Apply** to change the properties.

Deleting a backup job

You can select and delete one or more backup jobs from the jobs list in the **Schedule Backup Jobs** window.

Steps

1. Launch and log in to the SnapManager for Virtual Infrastructure GUI.
2. Click **Backup** in the navigation pane..
3. In the **Schedule Backup Jobs** window, select one or more backup jobs that you want to delete.

   In the Entities pane, note the existing datastore and virtual machines currently associated with the selected backup job. When the selected backup job is deleted, its backup operations are no longer carried out on these entities.

4. Click **Delete**, then click **Yes** on the confirmation prompt.

Suspending an active backup job

You can suspend an active backup job and its scheduled operations without deleting the job.

Steps

1. Launch and log in to the SnapManager for Virtual Infrastructure GUI.

2. Click **Backup** in the navigation pane..

3. In the **Schedule Backup Jobs** window, select the active backup job that you want to suspend.

In the Entities pane, note the existing datastore and virtual machines currently associated with the selected backup job. Once the selected backup job is suspended, its backup operations are no longer carried out on these entities.

4. Click **Suspend**, then click **Yes** on the confirmation prompt.

Resuming a suspended backup job

You can resume and run a suspended backup job.

Steps

1. Launch and log in to the SnapManager for Virtual Infrastructure GUI.

2. Click **Backup** in the navigation pane..

3. In the **Schedule Backup Jobs** window, select the suspended backup job that you want to resume.

> **Note:** The **Resume** button is not active unless the selected backup job is in a suspended state.

4. Click **Resume**, then click **Yes** on the confirmation prompt.

Restoring datastores and virtual machines

You can search for backups and restore your virtual machine, datastore, and virtual disk files from the **Restore** window.

If you restore a virtual machine or its virtual diskfiles to its original location on an NFS datastore, they are restored using single file snap restore. Single file restore is enabled with the SnapRestore® license. For all other restorations, the backup is mounted and corresponding files are copied to the restore location.

Next topics

Decisions to make before restoring a datastore or virtual machine

This list describes the information you must obtain before starting the **Restore** wizard.

Virtual restore decisions

Restore type	What do you want to restore (for example, a whole datastore, an entire virtual machine, or individual disk)?
	Note: Virtual machine restore is available only if the virtual machine has a complete Snapshot copy.
ESX host ID	What is the name of the ESX server that hosts the virtual machine?
	The ESX host will be used to mount the VM components. If the virtual machine is of an NFS datastore, you can provide the IP address or DNS name of the ESX server.
	Note: If you want to restore a virtual machine at the file level, the ESX host must be running VMware vSphere 4.
ESX host credentials	What are the ESX host credentials of the ESX host that the virtual machine will register with?

Backup metadata

The SnapManager for Virtual Infrastructure server relies on backup metadata to restore a datastore, virtual machine, or virtual disk file from a backup.

It stores the following information persistently in a repository:

- Mounts.xml , which stores information about mounted backups
- SFR-Mounts.xml , which stores the following information about mounted guestfile systems: access link, ESX host credentials, and the expiration time of the access link.

Restoring a datastore

You can use SnapManager for Virtual Infrastructure to restore a datastore. By doing so, you overwrite the existing content with the backup you select.

Steps

1. Click **Restore** in the navigation pane.

   The **Restore** window displays a list of its backups at the right.

2. Select a backup to restore from.

   You can list all the backups for the virtual machine by entering a partial name in the **Look for backups** field and clicking **Find Now** or using the **Advanced Find** feature.

3. Select the datastore that you want to restore from the list of backed-up entities.
4. In the Restore Datastore dialog box, click **Yes** to begin the restoration.

   SnapManager for Virtual Infrastructure takes a snapshot of the virtual machines on the datastore before it powers off and reloads them.

After you finish

After you end the **Restore** wizard and start the restore job, you can track the progress of the restore job from the **Restore** window and monitor the job for possible errors.

Restoring a virtual machine

You can use SnapManager for Virtual Infrastructure to restore a single virtual machine. By doing so, you overwrite the existing content with restored data.

Before you begin

Before restoring a virtual machine to its original location, have the following information available:

- The backup version that you want to restore.
- Whether you want to restore the entire virtual machine including its configuration, or just the individual virtual machine disk files (VMDKs).

Steps

1. Click **Restore** in the navigation pane.

   The **Restore** window displays a list of its backups at the right.

2. Select a backup to restore from.

   You can list all the backups for the virtual machine by entering a partial name in the **Look for backups** field and clicking **Find Now** or using the **Advanced Find** feature.

3. Select the virtual machine that you want to restore from the list of backed-up entities.

   The virtual machine icon indicates whether the backup job is partial or complete.When the backup is partial, you cannot restore the entire virtual machine.

4. Click **Restore** to launch the **Restore** wizard.

   The **Restore** wizard automatically chooses the virtual machine for you in the VM components selection window.

5. If the virtual machine is on a NFS datastore, enter the IP address of the ESX host.
6. Click **Next**

   A summary of the restore job displays.

7. Click **Finish** to end the wizard and begin the restore operation.

After you finish

After you end the **Restore** wizard and start the restore job, you can track the progress of the restore job from the **Restore** window and monitor the job for possible errors.

Next topics

Searching for backups

Use these instructions to use the Advanced Find feature.

Before you begin

In order to search for a backup on a guest file system, you have already performed the file mount operation.

About this task

You might want to search for backups taken recently or within a specific date range, that have with VMware snapshots, or that are on guest file systems.

Steps

1. Click Restore in the navigation pane to go to the Restore window.
2. Click **Advanced Find**.
3. In the Advanced Find dialog box, enter one of the following search options:

- In the "Look for backups" field, enter a name or UUID (Universally Unique Identifier) of a datastore or virtual machine.

    Note: You can specify multiple backup names and UUIDs (Universally Unique Identifiers) by entering them in a comma-separated list.The result lists all of the backups that have either one of the given names or UUIDs.

- Select either a recent backup and whether the of backup is a VMware snapshot or on a guest file system.
- Select a backup from a range of dates and whether the backup is a VMware snapshot or on a guest file system.

4. Click **Find Now**.

The backups are listed in the Restore window.

Mounting a backup

Mount a backup to check it for errors.

About this task

Once you have mounted a backup, you need to open a VI client that is running the vCenter Server software so that you can view the backup image and confirm that the image is valid.

Steps

1. Click **Restore** in the navigation pane.
2. In the **Restore** window, select a backup from the backup list.
3. Click **Mount**.
4. Enter the name of the ESX host to attach the backup on an ESX server.
5. Click **OK**.

After you finish

Check the backup list on the Restore window to see if the status for the backup has changed to Yes in the "Mounted" column.

Unmounting a backup

Unmount a backup to remove it from the ESX host. By doing so, SnapManager for Virtual Infrastructure removes the access point and deletes the backup.

Steps

1. Click **Restore** in the navigation pane.
2. In the **Restore** window, select a backup from the backup list.
3. Click **Unmount**.
4. In the Unmount Backup dialog box, click **Yes** to confirm the detachment.

After you finish

Check the backup list on the Restore window to see if the status for the backup has changed to "No" in the "Mounted" column.

Restoring virtual disk files

SnapManager for Virtual Infrastructure and the Restore Agent provide tools to help you restore backups of your virtual machine disks at the file level.

How these applications coordinate the restore process depends on the network connection between the systems that run the SnapManager for Virtual Infrastructure and Restore Agent and the level of access that the user has to the destination virtual machine.

Next topics

How SnapManager for Virtual Infrastructure detects network connectivity

SnapManager for Virtual Infrastructure uses the port group on the VMware vSphere virtual network to detect whether there is a connection between the server and the destination virtual machine.

When to configure port groups

SnapManager for Virtual Infrastructure collects information about the port group after it authenticates the user credentials of the vCenter Server. Therefore, to communicate with a Restore Agent instance that is installed on the destination virtual machine, you must reconfigure the port group on the **General** tab of the **Setup** window whenever there is a change to the port group settings on the virtual network.

What happens if you do not configure the port group settings

SnapManager for Virtual Infrastructure assumes that all port groups can communicate with the SnapManager for Virtual Infrastructure server. If the administrator does not change the virtual network configuration after registering the Restore Agent, then no additional configuration is necessary. However, if changes are made to the virtual network after initial setup, then you must reconfigure the port setting to ensure that the SnapManager for Virtual Infrastructure server can communicate with Restore Agent.

If there are changes to the network configuration after you create a restore session and after you install Restore Agent on the guest virtual machine, in addition to reconfiguring the port groups, you need to create a new restore session to send the new configuration file to the user to use it with Restore Agent.

The difference between limited and direct connectivity

The degree of access to a backup taken by SnapManager for Virtual Infrastructure is determined by whether there is a connection between the physical and virtual network.

In virtual environments in which the virtual machines are in a separate network from the SnapManager for Virtual Infrastructure server, Restore Agent cannot communicate with SnapManager for Virtual Infrastructure. As a result, the user has an *offline* connection and cannot access the list of backups that were made by SnapManager for Virtual Infrastructure. If users with limited connectivity want access to these backups, those users must have an administrator create a restore session and send a configuration file to them in an e-mail message.

When there is a direct or *online* connection between the SnapManager for Virtual Infrastructure server and the destination virtual machine, the user can search for mounted backups without administrative help.

By default, all virtual machines have direct connectivity, unless you change the port group setting.

Types of file restore sessions

SnapManager for Virtual Infrastructure automates the process of restoring single files based on the relationship between the source virtual machine (which was backed up) and the destination virtual machine. SnapManager for Virtual Infrastructure supports three types of restore sessions.

Self-service	The SnapManager for Virtual Infrastructure administrator creates a restore session using SnapManager for Virtual Infrastructure. Users can then install Restore Agent on the source or destination virtual machine, browse the mounted backups on a guest virtual machine, and restore the individual disk file.
Administrator-assisted	This type of file restoration is basically the same as self-service, except that the SnapManager for Virtual Infrastructure administrator runs Restore Agent and copies the restored files to a shared location that the user has access to.
Limited self-service	The SnapManager for Virtual Infrastructure administrator finds the backup copy within a user-specified range of backups and attaches the backed-up disks to the destination virtual machine. The user can then run Restore Agent on a destination virtual machine, browse the mounted backups, and restore the individual disk file.

General configuration settings for file restoration

Using the **General** tab of the **Setup** window, you should set some general configuration parameters so that you can use the single file restore feature.

Next topics

Configuring vCenter Server

After installing Restore Agent, you must configure basic settings for the vCenter Server so that SnapManager for Virtual Infrastructure can connect to the virtual machine and provide access to its contents.

Before you begin

To use the single file restore feature, vCenter Server must be running ESX 3.5 or later, or vSphere 4.

About this task

You will change the IP address and user credentials for vCenter Server.

Steps

1. In the navigation pane, click **Set up**.
2. Go to the vCenter Server area of the **Basic** tab .
3. Click **Edit** to change the following parameters:

   - Type the IP address of the vCenter Server instance that contains the virtual machine data that you want to restore.
   - Type the user name and password that SnapManager for Virtual Infrastructure will use to log in to vCenter Server.

Setting session defaults

When you set a session default from the **General** tab, any restore session that you subsequently create uses the default settings that you specified.

Steps

1. In the navigation pane, click the **General** tab.
2. Go to the Single File Restore area of the **General** tab.
3. Click **Edit** to change the following session defaults:

   • Type the location of the download directory for Restore Agent.
   • Select the number of hours or days before the restore session expires.

      Note: The **Default Session Expiration Time** field displays the time in hours. So, three days display as 72 hours.

4. Click **OK**.

Changing the network connection for a port group

You can change the type of restore session for a port group. By doing so, you change the network connection for all the virtual machines on the same subnet.

Steps

1. In the navigation pane, click the **General** tab.
2. From the **General** tab, select **Admin Assisted** for the port group.

Result

SnapManager for Virtual Infrastructure updates the information for the virtual machines that are reported for the port group and in the list of restore sessions in the **Single File Restore** tab.

Setting the SnapManager for Virtual Infrastructure server address

The restore session configuration file includes the SnapManager for Virtual Infrastructure server IP address and fully qualified domain name, but you might want to change the address or name with a specific one when you have a multi-homed server that has multiple IP addresses.

Step

1. Add the SnapManager for Virtual Infrastructure server IP address to the /etc/smvi.override file.

   SnapManager for Virtual Infrastructure will use this value, which can be an IP address or host name, instead of the one previously configured.

Self-service example workflow

To help you understand how a self-service restore session works, imagine that you are a VMware administrator and you need to restore from a backup copy of a virtual machine a critical data file that has become corrupted.

Your disk is running low on space, and you decide to give it some space from another drive. Halfway through the system optimization, whereby you defragment and resize the disk, the process stops. You restart the system and lose the partition and the partition tool. You fill out a help ticket and request access to another computer so that you can restore your data from a backup.

A SnapManager for Virtual Infrastructure administrator responds to your help ticket and verifies the scenario. The administrator sends you an e-mail message that provides information you need to access his computer, a link to download Restore Agent application software, and a configuration file.

The configuration file contains data that allows your workstation to communicate with the administrator's. Rather than the administrator doing the connection work, you can select which disks to connect to and find a backup.

The following list describes the tasks you need to complete for this example workflow.

Next topics

Create a self-service restore session

You will now create a restore session that you or a VMware administrator will use to access a guest operating system and find a backup to use.

Before you begin

Before creating a restore session, you need to gather the information necessary to complete the **Add Single File Restore Session** wizard:

• The name of the virtual machine: the backup source and destination
• The name of the virtual machine to which the backup will be restored t
• The e-mail message recipient and sender
• The mount expiration time: not used for this example, so you should accept the default of 24 hours

Ensure that you are authorized to perform all steps of this task on the vCenter Server. You can configure the authorization credentials from the **Basic** tab of the **Setup** window.

Steps

1. From the navigation pane, click **Restore**.
2. From the **Single File Restore** tab, click **Add** to start the **Add Single File Restore Session** wizard.
3. Complete the wizard, using the following values:

   - Source VM Name: **VM-WXP-EXAMPLE**
   - Destination VM Name: **VM-WXP-EXAMPLE**
   - Recipient Email Address(s): **user@example.com**
   - Sender Email Address: **user@example.com**
   - Mount Expiration: **10 days**
   - File Restore Access Type: **Self-service**
   - NIS domain server: **172.16.3.145**
   - CIFS settings: accept the defaults

4. Confirm the details of the restore session, then click **Finish** to complete the wizard.

Result

Your new restore session is listed in the **Single File Restore** tab.

After you finish

You receive an e-mail notification that contains a link to download Restore Agent, and you install the software.

Install Restore Agent

After you create a restore session you will receive an e-mail message that provides a link to the restore agent installation file and has a restore session configuration attached as an .sfr file. Before you can restore single files on a guest operating system, you must install Restore Agent.

Before you begin

Make sure that the system upon which you are going to install Restore Agent has the following software installed:

- Microsoft .NET Framework 3.5 Service Pack 1
- Microsoft Windows Service Pack 3

   Note: If you are running Windows 2008 R2 or Windows 7 and need to install the .NET Framework, you should run the installer by selecting it from the Server Manager > Features menu.

In addition, to enable the single file restore feature for an NFS datastore and perform a mount operation, you must purchase the FlexClone license and install it on the storage system.

Steps

1. Click the link in the e-mail message to download and start the installation process.
2. Follow the displayed instructions to install.

After you finish

Enable SnapManager for Virtual Infrastructure to communicate with Restore Agent through vCenter Server.

Configuring vCenter Server

After installing Restore Agent, you must configure basic settings for the vCenter Server so that SnapManager for Virtual Infrastructure can connect to the virtual machine and provide access to its contents.

Before you begin

To use the single file restore feature, vCenter Server must be running ESX 3.5 or later, or vSphere 4.

About this task

You will change the IP address and user credentials for vCenter Server.

Steps

1. In the navigation pane, click **Set up**.
2. Go to the vCenter Server area of the **Basic** tab .
3. Click **Edit** to change the following parameters:

   • Type the IP address of the vCenter Server instance that contains the virtual machine data that you want to restore.
   • Type the user name and password that SnapManager for Virtual Infrastructure will use to log in to vCenter Server.

Load the configuration file

You must load the configuration file that you received in the e-mail message, along with the link to download Restore Agent, and run it on the destination virtual machine to access the mounted backup virtual machine disk files.

About this task

You have already installed the Restore Agent on the destination virtual machine.

Steps

1. Double-click the Restore Agent shortcut icon on your desktop.
2. In the resulting **Load Configuration** window, look for the configuration (.sfr) file.
3. Click **OK**.

After you finish

When you are finished loading the configuration file, find the backup that you want to restore from.

Restore data from a backed up virtual machine

After you have been given access to files on the destination virtual machine, you can use the **Restore Agent** window to look at the backed up files created by SnapManager for Virtual Infrastructure and find the ones that you need to restore from.

Steps

1. From the **Restore Agent**, select one or more files from the Disk tab.

   Alternatively, click the **Backup tab** to find the files by backup name and file path.

2. Right-click the backup name and choose which disk drive will be the mount point.

   When you are restoring data on the original virtual machineRestore Agent displays the first-available disk drive letter.

   The contents of the backup copy will be written to the new location.

After you finish

After finishing this task, clear the configuration cache.

Clear the configuration

After restoring your data from a backed up virtual machine, you should clear the configuration so you can upload another one later.

Steps

1. From the Action pane in the **Restore Agent window**, click **Clear Configuration**.
2. In the resulting window, click **OK**.

   Backup and restore metadata will be removed from Restore Agent and SnapManager for Virtual Infrastructure.

Limited self-service example workflow

To help you understand how a limited self-service restore session works, imagine that you are a VMware administrator and you need to restore a failed disk on your virtual machine with the help of an SnapManager for Virtual Infrastructure administrator.

It's Thursday afternoon and one of the disks on the virtual machine has failed and is unreadable. You need to restore the disk during the weekend. You fill out a help ticket and requests access to another workstation so that you can recover the data from a backup.

A SnapManager for Virtual Infrastructure administrator responds to your help ticket and makes his system available from Saturday morning for 48 hours. He sends you an e-mail message that provides information you need to access his computer, a link to a site from which you can download Restore Agent application software, and a configuration file.

The configuration file contains attached disks so that your operating system can see which disks are attached and assign drive letters that will allow your workstation to connect to the SnapManager for Virtual Infrastructure administrator's.

The following list describes the tasks you need to complete for this example workflow.

Next topics

Create a limited self-service restore session

The first thing you need to do is create a restore session that a user can use to access a guest operating system restore a virtual machine disk file.

Before you begin

Before creating a restore session, you need to gather the information necessary to complete the **Add Single File Restore Session** wizard:

- The name of the virtual machine: the backup source and destination
- The name of the virtual machine to which the backup will be restored
- The e-mail message recipient and sender
- The mount expiration time: three hours

Ensure that you are authorized to perform all steps of this task on the vCenter Server. You can configure the authorization credentials from the **Basic** tab of the **Setup** window

Steps

1. From the navigation pane, click **Restore**.
2. From the **Single File Restore** tab, click **Add** to start the **Add Single File Restore Session** wizard.
3. Complete the wizard, using the following values:

    - Source VM Name: **VM-WXP-EXAMPLE**
    - Destination VM Name: **VM-WXP-EXAMPLE**
    - To Email Address(s): **user2@example.com**
    - From Email Address: **user2@example.com**
    - Mount Expiration: **3 days**
    - File Restore Access Type: **Limited Self-Service**

4. Confirm the details of the restore session, then click **Finish** to complete the wizard.

Result

Your new restore session is listed in the **Single File Restore** tab.

After you finish

You receive an e-mail notification that contains a link to download Restore Agent, and you install the software.

Install Restore Agent

After you create a restore session you will receive an e-mail message that provides a link to the restore agent installation file and has a restore session configuration attached as an .sfr file. Before you can restore single files on a guest operating system, you must install Restore Agent.

Before you begin

Make sure that the system upon which you are going to install Restore Agent has the following software installed:

- Microsoft .NET Framework 3.5 Service Pack 1
- Microsoft Windows Service Pack 3

   Note: If you are running Windows 2008 R2 or Windows 7 and need to install the .NET Framework, you should run the installer by selecting it from the Server Manager > Features menu.

In addition, to enable the single file restore feature for an NFS datastore and perform a mount operation, you must purchase the FlexClone license and install it on the storage system.

Steps

1. Click the link in the e-mail message to download and start the installation process.
2. Follow the displayed instructions to install.

After you finish

Enable SnapManager for Virtual Infrastructure to communicate with Restore Agent through vCenter Server.

Configuring vCenter Server

After installing Restore Agent, you must configure basic settings for the vCenter Server so that SnapManager for Virtual Infrastructure can connect to the virtual machine and provide access to its contents.

To use the single file restore feature, vCenter Server must be running ESX 3.5 or later, or vSphere 4.

You will change the IP address and user credentials for vCenter Server.

Steps

1. In the navigation pane, click **Set up**.
2. Go to the vCenter Server area of the **Basic** tab .
3. Click **Edit** to change the following parameters:

- Type the IP address of the vCenter Server instance that contains the virtual machine data that you want to restore.
- Type the user name and password that SnapManager for Virtual Infrastructure will use to log in to vCenter Server.

Load the configuration file

You must load the configuration file that you received in the e-mail message, along with the link to download Restore Agent, and run it on the destination virtual machine to access the mounted backup virtual machine disk files.

About this task

You have already installed the Restore Agent on the destination virtual machine.

Steps

1. Double-click the Restore Agent shortcut icon on your desktop.
2. In the resulting **Load Configuration** window, look for the configuration (.sfr) file.
3. Click **OK**.

After you finish

When you are finished loading the configuration file, find the backup that you want to restore from.

Restore data from a backed up virtual machine

After you have been given access to files on the destination virtual machine, you can use the **Restore Agent** window to look at the backed up files created by SnapManager for Virtual Infrastructure and find the ones that you need to restore from.

Steps

1. From the **Restore Agent**, select one or more files from the Disk tab.

   Alternatively, click the **Backup tab** to find the files by backup name and file path.

2. Right-click the backup name and choose which disk drive will be the mount point.

   When you are restoring data on the original virtual machineRestore Agent displays the first-available disk drive letter.

   The contents of the backup copy will be written to the new location.

After you finish

After finishing this task, clear the configuration cache.

Clear the configuration

After restoring your data from a backed up virtual machine, you should clear the configuration so you can upload another one later.

Steps

1. From the Action pane in the **Restore Agent window**, click **Clear Configuration**.
2. In the resulting window, click **OK**.

   Backup and restore metadata will be removed from Restore Agent and SnapManager for Virtual Infrastructure.

SnapManager for Virtual Infrastructure commands

You can use the SnapManager for Virtual Infrastructure command-line interface to perform specific SnapManager for Virtual Infrastructure tasks.

Remember the following general notes about the commands.

- SnapManager for Virtual Infrastructure commands are case-sensitive.
- There are no privilege levels; any user with a valid user name and password can run all commands:

For some commands, the following two parameters control the amount of output to display.

verbose	This optional parameter provides detailed output when displaying information.
quiet	This optional parameter stops any output from displaying.
	Note: Even with the quiet parameter specified, failed commands still display their failure message.

Next topics

Launching the SnapManager for Virtual Infrastructure CLI

You can launch the SnapManager for Virtual Infrastructure CLI by using the desktop shortcut or the Windows Start menu.

About this task

When you use the SnapManager for Virtual Infrastructure CLI for the first time, the application uses your Windows user credentials by default to authenticate and validate your access to the SnapManager for Virtual Infrastructure server. When you issue your first CLI command, the CLI prompts for your password and then runs the command. If the command succeeds, the CLI caches your user credentials and stores the information locally in an encrypted format.

An alternative method to using your Windows user credentials is to use the `smvi servercredential set` command to create new custom user credentials that allow you to log in to the SnapManager for Virtual Infrastructure server.

Step

1. Double-click the **smvi cli** desktop icon or navigate to **Start > All Programs > IBM > smvi CLI**

smvi backup create

The `smvi backup create` command creates a backup of a virtual machine or datastore. You can also perform this operation using the SnapManager for Virtual Infrastructure GUI.

Syntax

```
smvi backup create -id {name | id} [name | id ...] [-backup-name {backup
name}] [-server {server name}] [-update-mirror] [-quiet] [-verbose] [-user]
 [-help]
```

Parameters
-id {*name* | *id*} [*name* | *id* ...]

> This mandatory parameter specifies the name or identification of the datastore or virtual machine that you are backing up. You can specify names or identifications of multiple names or datastores.

[-backup-name {*backup name*}]

>   This optional parameter specifies a backup name. After adding the flag, add a name
>   for the backup.
>
>   > **Note:** If you specify no name with this flag, the command fails. If you specify a
>   > name that contains only spaces, SnapManager for VI auto-generates a name. If you
>   > specify a name that contains both spaces and nonspace characters, SnapManager
>   > for VI removes all leading and trailing spaces from the name.

[-server {*server name*}]

>   This optional parameter specifies the name of the SnapManager for Virtual
>   Infrastructure server to which you are sending this command. The default value is
>   localhost.

[-update-mirror]

>   This optional parameter initiates a SnapMirror image on the secondary storage.

[-quiet]

>   This optional parameter stops any output from displaying.

[-verbose]

>   This optional parameter provides detailed output when displaying information.

[-user]

>   Add this optional parameter if you want log in to the SnapManager for Virtual
>   Infrastructure server with different user credentials than you are currently logged in
>   with.

[-help]

>   This optional parameter displays help for this command.

Example: Creating a backup from a virtual machine

The following example creates a backup from a virtual machine named nfs1_vm1 without
specifying a backup name:

```
smvi backup create -id nfs1_vm1

[13:14] Starting backup request
[13:14] [WARN] Backup name is not set. Using default value
'backup_01fb4992a28188686d4e4a3ded34bfa4'
[13:14] Backing up datastore(s) ([nfs.123.17.170./vol/nfs_vol1/)])
[13:14] Backing up the following virtual machine(s) ([nfs1_vm1])
[13:14] Creating VMware snapshots for all virtual machines that are being
 backed up.
[13:14] Creating storage snapshots for all datastores/virtual machines
that are being backed up.
[13:14] Removing VMware snapshots for all virtual machines that are being
 backed up.
```

```
[13:14] Backup of datastores/virtual machines is complete.
SMVICLI-0100: Command completed successfully
```

smvi backup delete

The smvi backup delete command removes a virtual machine or datastore backup. You can also perform this operation using the SnapManager for Virtual Infrastructure GUI.

Syntax

```
smvi backup delete -backup-name {backup name} [-server {server name}] [-quiet]
[-verbose] [-noprompt] [-user] [-help]
```

Description

Note: If you delete the most recent backup associated with a backup job, then the Last Run Status value displayed for that backup job in the **Schedule Backup Jobs** window will be that of the most recent remaining undeleted backup associated with the backup job.

Parameters

-backup-name {*backup name*}

>   This mandatory parameter specifies the backup you want to delete. After adding the flag, add the name of the backup.

[-server {*server name*}]

>   This optional parameter specifies the name of the SnapManager for Virtual Infrastructure server to which you are sending this command. The default value is localhost.

[-quiet]

>   This optional parameter stops any output from displaying.

[-verbose]

>   This optional parameter provides detailed output when displaying information.

[-noprompt]

>   By default, a prompt appears asking for confirmation when deleting a backup. This optional parameter disables the prompt.

[-user]

>   Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-help]

> This optional parameter displays help for this command.

Example: Deleting a backup

The following example deletes a backup named new-one:

```
smvi backup delete -backup-name new-one

Are you sure you want to proceed and remove backup named 'new-one'?
[yes|NO] y
[15:15] Removed backup with name "new-one"
SMVICLI-0100: Command completed successfully
```

---

smvi backup list

The smvi backup list command displays information about all of the created and saved backups within a virtual machine or datastore. You can also perform this operation using the SnapManager for Virtual Infrastructure GUI.

Syntax

```
smvi backup list [-id {name | id} [name | id ...]] [-backup-name {backup
name}] [-mounted] [-failed] [-server {server name}] [-user] [-help]
```

Parameters

[-id {*name* | *id*} [*name* | *id* ...]]

> This mandatory parameter specifies the name or identification of the datastores or virtual machines that you want to list.

[-backup-name {*backup name*}]

> This optional parameter specifies the backup you want to list. After adding the flag, add the name of the backup.

[-failed]

> This optional parameter lists all failed backups. The default list is only successful backups.

[-mounted]

> This optional parameter lists all mounted backups.

[-server {*server name*}]

This optional parameter specifies the name of the SnapManager for Virtual Infrastructure server to which you are sending this command. The default value is localhost.

[-user]

Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-help]

This optional parameter displays help for this command.

Example: Listing backups in a datastore

The following example lists all of the backups within a datastore named data-store1:

```
smvi backup list -id data-store01

Id Name Date Entities Snapshot Name
-------- -------------------- -------------------- ----------------
New Feb 26, 2008 11:32 vmfs_vm1 smvi_New _vmfs_datastore
backup_e79397f69b1d47255492cef40bb0702f Feb 26, 2008 11:32 vmfs_vm1
smvi_backup_e79397f69b1d47255492cef40bb0702f_vmfs_datastore
```

---

smvi backup mount

The smvi backup mount command mounts a backup to verify its contents.

Syntax

```
smvi backup mount -backup-name {backup name} -esx-server {esx server name}
[-server {server name}] [-quiet] [-verbose] [-user] [-help]
```

Privilege level

Note: To mount a VMFS datastore backup, the supplied ESX server must have SAN or iSAN access to the storage system, including required FC zoning or iSCSI discovery. To mount an NFS datastore backup, the supplied ESX server must be in the NFS export list of the original datastore.

Parameters

-backup-name {*backup name*}

This mandatory parameter specifies the backup you want to mount. After adding the flag, add the name of the backup.

-esx-server {*esx server name | IP address*}

This mandatory parameter specifies the name or IP address of the ESX server. This information describes where the backup resides on an ESX server, since it allows you to register into and then access the server via SSH.

> **Note:** The server name is the name of the ESX server as viewed through the VI client. This name might differ from the ESX serverâ€™s host name or IP address.

[-server {*server name*}]

This optional parameter specifies the name of the SnapManager for Virtual Infrastructure server to which you are sending this command. The default value is localhost.

[-quiet]

This optional parameter stops any output from displaying.

[-verbose]

This optional parameter provides detailed output when displaying information.

[-user]

Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-help]

This optional parameter displays help for this command.

Example: Mounting a backup

The following example mounts a backup named vmfs2_vm1 on an ESX server with the IP address of 123.12.1.23:

```
smvi backup mount -backup-name vmfs2_vm1 -esx-server 123.12.1.23
```

```
[12:12] Starting mount request
SMVICLI-0100: Command completed successfully
```

smvi backup rename

The smvi backup rename command changes the name of a backup. Changing the name of a backup also changes the name on the corresponding storage Snapshot copy on the associated IBM storage system. You can also perform this operation using the SnapManager for Virtual Infrastructure GUI.

Syntax

```
smvi backup rename -backup-name {backup name} -new-backup-name {new name}
[-server {server name}] [-user] [-help]
```

Parameters

-backup-name {*backup name*}

> This mandatory parameter specifies the backup you want to rename. After adding the flag, add the name of the backup.

-new-backup-name {*new name*}

> This mandatory parameter specifies the new name of the backup. After adding the flag, add a new name for the backup.

[-quiet]

> This optional parameter stops any output from displaying.

[-verbose]

> This optional parameter provides detailed output when displaying information.

[-noprompt]

> By default, a prompt appears asking users for confirmation when deleting a backup. This optional parameter disables the prompt.

[-user]

> Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-help]

> This optional parameter displays help for this command.

Example: Renaming a backup

The following example renames a backup named vmfs2-vm1 to volume-2:

```
smvi backup rename -backup-name vmfs2-vm1 -new-backup-name volume-2

[15:52] Backup "vmfs2-vm1" has been renamed to "volume-2"
SMVICLI-0100: Command completed successfully
```

smvi backup restore

The `smvi backup restore` command restores a virtual machine or datastore from a backup. You can also perform this operation using the SnapManager for Virtual Infrastructure GUI.

Syntax

```
smvi backup restore -id {name | id} [-esx-server {esx server name]
[-backup-name {backup name}] [-server {server name}] [-quiet] [-verbose]
[-noprompt] [-user] [-help]
```

Parameters
-id {*name* | *id*}

> This mandatory parameter specifies the name or identification of the datastore or virtual machine that you are restoring.

[-esx-server {*esx server name* | *IP address*}]

> This parameter specifies the name or IP address of the ESX server.

> > **Note:** This parameter is required when restoring a VMFS datastore or a virtual machine that resides on a VMFS datastore.

> > **Note:** The server name is the name of the ESX server as viewed through the VI client. This name might differ from the ESX serverâ€™s host name or IP address.

[-backup-name {*backup name*}]

> This optional parameter specifies which backup to restore. After adding the flag, add the name of the backup. If not specified, the latest available backup for the specified datastore or virtual machine is restored.

[-server {*server name*}]

> This optional parameter specifies the name of the SnapManager for Virtual Infrastructure server to which you are sending this command. The default value is localhost.

[-quiet]

> This optional parameter stops any output from displaying.

[-verbose]

This optional parameter provides detailed output when displaying information.

[-noprompt]

By default, a prompt appears asking for confirmation when restoring a backup. This optional parameter disables the prompt.

[-user]

Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-help]

This optional parameter displays help for this command.

Example: Restoring a backup

The following example restores a virtual machine named nfs1-vm1 from a backup named backup-411:

```
smvi backup restore -id nfs1_vm1 -backup-name backup-411

Are you sure you want to proceed with this operation? [yes|NO] y
[11:04] Starting restore request
[11:04] [WARN] No active mounts found for datastore vmfs_ds1
(47ab69d8-e7c72da0-d6c5-001a6412251d)
[11:05] Restoring nfs virtual machine on folder 'nfs1_vm1'
[11:07] Reloading virtual machine
[11:07] Restore is complete
SMVICLI-0100: Command completed successfully
```

---

smvi backup unmount

The `smvi backup unmount` command unmounts a mounted virtual machine or datastore backup.

Syntax

```
smvi backup unmount -backup-name {backup name} [-server {server name}] [-quiet]
[-verbose] [-user] [-help]
```

Description

Note: You must unmount a mounted backup in order to delete the backup or any of its preceding Snapshot copies.

Parameters

-backup-name {*backup name*}

>   This mandatory parameter specifies which backup to unmount. After adding the flag,
>   add the name of the backup.

[-server {*server name*}]

>   This optional parameter specifies the name of the SnapManager for Virtual
>   Infrastructure server to which you are sending this command. The default value is
>   localhost.

[-quiet]

>   This optional parameter stops any output from displaying.

[-verbose]

>   This optional parameter provides detailed output when displaying information.

[-user]

>   Add this optional parameter if you want log in to the SnapManager for Virtual
>   Infrastructure server with different user credentials than you are currently logged in
>   with.

[-help]

>   This optional parameter displays help for this command.

Example: Unmounting a backup

The following example unmounts a backup named vmfs2_db:

```
smvi backup unmount -backup-name vmfs-2-db

[11:55] Starting unmount request
[11:55] Unmount is complete
SMVICLI-0100: Command completed successfully
```

---

smvi discover datastores

The `smvi discover datastores` command lists the datastores that are managed by the current
vCenter Server and that reside on the storage systems currently assigned to your SnapManager for
Virtual Infrastructure server.

Syntax

```
smvi discover datastores
```

Example: Listing the datastores

The following example lists all the datastores managed by the current vCenter Server that reside on storage systems assigned to SnapManager for Virtual Infrastructure:

```
smvi discover datastores

Password for Nseries\vanib: *********
Datacenter: Aladdin
Datastore: nfs_datastore6
NFS: 172.17.170.21:/vol/nfs_vol6
Datastore: nfs_datastore7
NFS: 172.17.170.21:/vol/nfs_vol7
Datastore: nfs_datastore7 (Backup test1)
NFS: 172.17.170.21:/vol/nfs_vol7_mount_33e49878c5e74363825e84652a724aef
Datastore: nfs_datastore7 (Backup test0)
NFS: 172.17.170.21:/vol/nfs_vol7_mount_90a6b1e7d6f948beaa6735af9692b3d4
Datastore: nfs_datastore7 (Backup backup_fgfdgfdgf_20080707134801)
NFS: 172.17.170.21:/vol/nfs_vol7_mount_e50fc0eda0674cfbbf200f87f83ba8eb
Datastore: nfs_datastore8
NFS: 172.17.170.21:/vol/nfs_vol8
Datastore: nfs_datastore8 (Backup
backup_7d8597b0dfffd5c81806728dd45aea48)
NFS: 172.17.170.21:/vol/nfs_vol8_mount_e7df47fbde00446cb6b589c821adc4dd
Datastore: vmfs_datastore5
LUN: 172.17.170.21:/vol/vmfs_vol5/lun5 Partition: 1
LUN: 172.17.170.21:/vol/vmfs_vol6/lun6 Partition: 1
Datastore: vmfs_datastore2
LUN: 172.17.170.21:/vol/vmfs_vol2/vmfs_lun2 Partition: 1
Datastore: vmfs_datastore3
LUN: 172.17.170.21:/vol/vmfs_vol3/lun3 Partition: 1
Datastore: vmfs_datastore4
LUN: 172.17.170.21:/vol/vmfs_vol4/lun4 Partition: 1
Datastore: vmfs_datastore7
LUN: 172.17.170.21:/vol/vmfs_vol7/qtree_vol7/lun7 Partition: 1
Datastore: snap-00000002-vmfs_datastore
LUN: 172.17.170.21:/vol/vmfs_vol1/vmfs_lun1 Partition: 1
Datastore: vmfs7_testAJ_1
LUN: 172.17.170.21:/vol/volaj1/lun1 Partition: 1
Datastore: vmfs7_testAJ-2
```

```
LUN: 172.17.170.21:/vol/volaj1/lun2 Partition: 1
Datacenter: Bellagio
```

smvi filerestore add-portgroup

The smvi filerestore add-portgroup command assigns virtual machines to a port group. You can also perform this operation using the SnapManager for Virtual Infrastructure GUI.

Syntax

```
smvi filerestore add-portgroup [-verbose] [-user] [-help]
```

Parameters

[-name{*port group name*}]

> This mandatory parameter specifies the name of the port group, or network, that is used to enable or disable administrator-assisted file-level restore operations.

[-server {*server name*}]

> This optional parameter specifies the name of the SnapManager for Virtual Infrastructure server to which you are sending this command. The default value is localhost.

[-verbose]

> This optional parameter provides detailed output when displaying information.

[-user]

> Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-help]

> This optional parameter displays help for this command.

smvi filerestore delete-portgroup

The `smvi filerestore delete-portgroup` command removes the port group and disables file restore sessions for the virtual machines assigned to the port groupYou can also perform this operation using the SnapManager for Virtual Infrastructure GUI.

Syntax

```
smvi filerestore delete-portgroup [-name{port group name}] [-server {server
 name}] [-user] [-verbose]  [-help]
```

Parameters
[-name{*port group name*}]

> This mandatory parameter specifies the name of the port group, or network, that is used to enable or disable administrator-assisted file-level restore operations.

[-server {*server name*}]

> This optional parameter specifies the name of the SnapManager for Virtual Infrastructure server to which you are sending this command. The default value is localhost.

[-user]

> Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-verbose]

> This optional parameter provides detailed output when displaying information.

[-help]

> This optional parameter displays help for this command.

smvi notification list

The `smvi notification list` command displays information about the alert notification.

Syntax

```
smvi notification list [-server {server name}] [-user] [-verbose] [-help]
```

Parameters
[-server {*server name*}]

This optional parameter specifies the name of the SnapManager for Virtual Infrastructure server to which you are sending this command. The default value is localhost.

[-user]

Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-verbose]

This optional parameter provides detailed output when displaying information.

[-help]

This optional parameter displays help for this command.

smvi notification set

The smvi notification set command displays information about the alert notification.

Syntax

```
smvi notification set [-smtp server {dns name | ip address}] [-from {from
email address}] [-to {to email address}]  [-server {server name}] [-user]
[-verbose] [-help]
```

Parameters

[-smtp server {*dns name | ip address*}]

This mandatory parameter specifies the name or IP address of the SMTP server that handles the test notification e-mail.

[from {*from email address*}]

This mandatory parameter specifies the sender e-mail address.

[to {*to email address*}]

This mandatory parameter specifies the comma-separated list of recipient e-mail addresses.

[-server {*server name*}]

This optional parameter specifies the name of the SnapManager for Virtual Infrastructure server to which you are sending this command. The default value is localhost.

[-user]

Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-verbose]

> This optional parameter provides detailed output when displaying information.

[-help]

> This optional parameter displays help for this command.

smvi notification test

The `smvi notification test` command displays information about the test notification.

Syntax

```
smvi notification test [-server {server name}] [-user] [-verbose] [-help]
```

Parameters

[-server {*server name*}]

> This optional parameter specifies the name of the SnapManager for Virtual Infrastructure server to which you are sending this command. The default value is localhost.

[-user]

> Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-user]

> Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-help]

> This optional parameter displays help for this command.

smvi restoreagent set

The `smvi restoreagent set` command sets the default installation URL of the restore agent. You can also perform this operation using the SnapManager for Virtual Infrastructure GUI.

Syntax

```
smvi vcserver set [-server {server name}] [-url] [-user] [-verbose] [-help]
```

Description

> **Note:** You can only connect to one VC server at a time.

Parameters

[-server {*server name*}]

> This optional parameter specifies the name of the SnapManager for Virtual Infrastructure server to which you are sending this command. The default value is localhost.

[-user]

> Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-help]

> This optional parameter displays help for this command.

Example: Setting a VC server

The following example sets a VC server with the IP address of 123.4.56.78:

```
smvi vcserver set -name 123.4.56.78
```

---

smvi servercredential delete

The `smvi servercredential delete` command deletes a user account created by the `smvi servercredential set` command.

Syntax

```
smvi servercredential delete -username {user name} [-help]
```

Description

> **Note:** You cannot run this command from a remote host.

Parameters

-username {*user name*}

> This mandatory parameter specifies the internal user account that you want to delete.

[-help]

> This optional parameter displays help for this command.

Example: Deleting a user account

The following example deletes the olduser2 user account:

```
smvi servercredential delete -username olduser2

SMVICLI-0100: Command completed successfully
```

---

smvi servercredential list

The `smvi servercredential list` command lists a user account created by the `smvi servercredential set` command.

Syntax

```
smvi servercredential list [-help]
```

Description

> **Note:** You cannot run this command from a remote host.

Parameters

[-help]

       This optional parameter displays help for this command.

Example: Listing the server credentials

The following example lists the current SnapManager for VI server credentials:

```
smvi servercredential list

Username
```

```
-----------------------------------------------------------
administrator
```

smvi servercredential set

The `smvi servercredential set` command adds a user account for SnapManager for VI to use for authentication instead of your Windows user credentials.

Syntax

```
smvi servercredential set [-help]
```

Description

Note: You cannot run this command from a remote host.

Parameters

[-help]

> This optional parameter displays help for this command.

Example: Adding a user account

The following example adds a user account named administrator and sets a seven character password:

```
smvi servercredential set

Username: administrator
Password: *******
SMVICLI-0100: Command completed successfully
```

---

smvi storagesystem add

The `smvi storagesystem add` command adds to your configuration. You can also perform this operation using the SnapManager for Virtual Infrastructure GUI.

Syntax

```
smvi storagesystem add -name {DNS name | IP address} [-server {server name}]
[-user] [-help]
```

Parameters

-name {*DNS name* | *IP address***}**

> This mandatory parameter specifies the DNS name or management IP address of the IBM storage system that you are adding.

[-server {*server name***}]**

> This optional parameter specifies the name of the SnapManager for Virtual Infrastructure server to which you are sending this command. The default value is localhost.

[-user]

> Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-help]

> This optional parameter displays help for this command.

Example: Adding a storage system

The following example adds a server with an IP address of 123.18.20.25, enters its administrator user name as client-1, and enters this user's ten character password:

```
smvi storagesystem add -name 123.18.20.25

Enter username : client-1
Enter password : **********
smvicli-0100: Command completed successfully
```

---

smvi storagesystem delete

The `smvi storagesystem delete` command deletes an added IBM storage system. You can also perform this operation using the SnapManager for Virtual Infrastructure GUI.

Syntax

```
smvi storagesystem delete -name {DNS name | IP address} [-server {server name}] [-user] [-help]
```

Parameters

-name {*DNS name* | *IP address***}**

> This mandatory parameter specifies the DNS name or management IP address of the IBM storage system that you are deleting. You must provide the exact name or IP address of the storage system, or the command fails.

[-server {*server name*}]

> This optional parameter specifies the name of the SnapManager for Virtual Infrastructure server to which you are sending this command. The default value is localhost.

[-user]

> Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-help]

> This optional parameter displays help for this command.

Example: Deleting a storage system

The following example deletes named Jaguar:

```
smvi storagesystem delete -name Jaguar

smvicli-0100: Command completed successfully
```

---

smvi storagesystem list

The `smvi storagesystem list` command lists the added IBM storage systems.

Syntax

```
smvi storagesystem list [-server {server name}] [-user] [-verbose] [-help]
```

Parameters

[-server {*server name*}]

> This optional parameter specifies the name of the SnapManager for Virtual Infrastructure server to which you are sending this command. The default value is localhost.

[-user]

> Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-verbose]

> This optional parameter provides detailed output when displaying information.

[-help]

This optional parameter displays help for this command.

Example: Listing the storage systems

The following example lists the IBM storage systems that reside in the local SnapManager for VI server; in this case, a single storage system with an IP address of 123.17.170.21:

```
smvi storagesystem list

Name                                  IP Address
------------------------------------- ---------------
123.17.170.21                         123.17.170.21
```

---

smvi storagesystem modify

The `smvi storagesystem modify` command modifies a saved IBM storage system. You can also perform this operation using the SnapManager for Virtual Infrastructure GUI.

Syntax

```
smvi storagesystem modify -name {DNS name | IP address} [-server {server
name}] [-user] [-help]
```

Parameters

-name {*DNS name | IP address*}

This mandatory parameter specifies the DNS name or management IP address of the IBM storage system that you are modifying. You must provide the exact name or IP address of the storage system, or the command fails.

[-server {*server name*}]

This optional parameter specifies the name of the SnapManager for Virtual Infrastructure server to which you are sending this command. The default value is localhost.

[-user]

Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-help]

This optional parameter displays help for this command.

Example: Modifying a storage system

The following example updates the user name for the IBM storage system with an IP address of 123.18.20.25 to root and enters this user's ten character password:

```
smvi storagesystem modify -name 123.18.20.25

Username for 123.18.20.25: root
Password for 123.18.20.25: **********
smvicli-0100: Command completed successfully
```

---

smvi vcserver list

The smvi vcserver list command lists the VC server that is set.

Syntax

```
smvi vcserver list [-server {server name}] [-user] [-help]
```

Parameters

[-server {*server name*}]

> This optional parameter specifies the name of the SnapManager for Virtual Infrastructure server to which you are sending this command. The default value is localhost.

[-user]

> Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-help]

> This optional parameter displays help for this command.

Example: Listing the VC server

The following example lists the currently set VC server named vcserver:

```
smvi vcserver list

Server              Port                Username
```

```
-------------------- -------------------- --------------------
vcserver             DEFAULT              Administrator
```

smvi vcserver set

The `smvi vcserver set` command sets the VC server. You can also perform this operation using the SnapManager for Virtual Infrastructure GUI.

Syntax

```
smvi vcserver set -name {DNS name | IP address} [-port {port number}] [-server
{server name}] [-vc-user] [-user] [-help]
```

Description

Note: You can only connect to one VC server at a time.

Parameters

-name {*DNS name | IP address*}

This mandatory parameter specifies the DNS name or management IP address of the VC server that you are setting.

[-port {*port number*}]

This optional parameter specifies the port number used to communicate with the VC server. The default port is 443.

[-server {*server name*}]

This optional parameter specifies the name of the SnapManager for Virtual Infrastructure server to which you are sending this command. The default value is localhost.

[-vc-user]

Add this optional parameter if you want to log in to the VC server with different user credentials than you are currently logged in with. This option is only available from the CLI.

[-user]

Add this optional parameter if you want log in to the SnapManager for Virtual Infrastructure server with different user credentials than you are currently logged in with.

[-help]

This optional parameter displays help for this command.

> **Example: Setting a VC server**
>
> The following example sets a VC server with the IP address of 123.4.56.78:
>
> ```
> smvi vcserver set -name 123.4.56.78
> ```

smvi version

The `smvi version` command displays the version of the SnapManager for VI CLI and server.

Syntax

```
smvi version [-server {server name}] [-help]
```

Parameters

[-server {*server name*}]

> This optional parameter specifies the name of the SnapManager for Virtual Infrastructure server to which you are sending this command. The default value is localhost.

[-help]

> This optional parameter displays help for this command.

> **Example: Displaying the version**
>
> The following example displays a SnapManager for VI CLI and server which are both at version 1.0:
>
> ```
> smvi version
>
> SnapManager for Virtual Infrastructure CLI 1.0 (build date='080307_0110',
>  version='87')
> SnapManager for Virtual Infrastructure Server 1.0 (build
> date='080307_0110', version='87')
> ```

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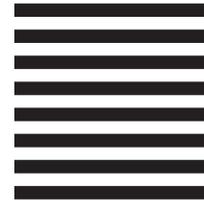Phone No.   E-mail address

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