

Symantec Storage Foundation™ Quick Recovery Solutions Guide for Enterprise Vault

Windows

6.1

Symantec Storage Foundation™ Quick Recovery Solutions Guide for Enterprise Vault

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Introducing Quick Recovery for Enterprise Vault

This chapter includes the following topics:

- [About Quick Recovery snapshot solutions](#)
- [About snapshot-assisted backups](#)
- [Advantages of Quick Recovery snapshots](#)
- [Quick Recovery process](#)
- [Enterprise Vault components supported by SFW](#)
- [Methods of implementing Quick Recovery snapshots](#)
- [About the components used in Quick Recovery](#)

About Quick Recovery snapshot solutions

Symantec Storage Foundation for Windows (SFW) provides the capability to create a point-in-time image of all the volumes associated with an Enterprise Vault component. This image, called a snapshot set, is a complete copy of the Enterprise Vault component at the specific point in time the snapshots are taken.

SFW uses Veritas FlashSnap™ technology along with the Microsoft Volume Shadow Copy Service (VSS) framework to quiesce the component and ensure a persistent snapshot of the production data.

Quick recovery is the term for creating and maintaining the SFW snapshot sets that are stored on the host where the snapshot was taken. They are used to quickly recover databases in the event of corruption or an accidental /malicious update. The quick recovery solution provides fast recovery from logical errors and eliminates

the time-consuming process of restoring data from tape. Databases can be recovered to the point in time when the snapshot was taken.

You can create multiple snapshot sets for each Enterprise Vault component and set up schedules for creating and refreshing the snapshot sets. The snapshot sets can be maintained on-host as a Quick Recovery solution.

SFW snapshots use a split-mirror snapshot method. The snapshot is a separate persistent volume that contains an exact duplicate of all the data on the original volume at the time the snapshot is taken. This type of persistent physical snapshot is also known as a Clone (HP) or a BCV (EMC).

Because a snapshot set contains a split-mirror snapshot copy of each of the volumes in the component, the snapshot set requires the same amount of space as the original volumes.

Veritas FlashSnap technology is also integrated into the 6.0 Advanced Client Option and Symantec Backup Exec™ 10d Advanced Disk-based Backup Option. These products are the preferred solution for on and off host snapshot-assisted backup.

About snapshot-assisted backups

Since a snapshot set created using SFW is an exact copy of the production data, it can be used with a backup application in place of the production volumes to produce regular backups to tape or other media. A snapshot set can be used for backup either on-host or moved to a secondary server.

A snapshot-assisted backup provides the following advantages:

- Reduces backup I/O load on the production volumes in an on-host environment, allowing backup to be completed with less impact to the users
- Eliminates backup I/O load on the production server in an off-host environment

Advantages of Quick Recovery snapshots

A Quick Recovery solution serves as a first line of defense to recover components that have been subject to accidental or malicious updates. Quick Recovery is designed to augment your traditional backup methodology. Maintaining a snapshot set requires just the few seconds it takes to detach a split-mirror snapshot from its original volume. On-host snapshot recovery is faster than restoring a full backup from tape or other media; on-host snapshot recovery reduces downtime and helps meet service-level agreements for application availability.

In addition to the primary benefit of recovery from logical errors, snapshot sets can be moved over a SAN to another server and used for other purposes including:

- Application tuning and testing—data can be updated and modified in a realistic environment without impacting users.
- Business reporting and decision analysis—up-to-date data is available with minimal impact on the production environment.

Quick Recovery process

The Quick Recovery process can be broken down into the following phases:

- Creating an initial snapshot set

This has two stages:

 - Preparing the mirror for the snapshot set

This stage takes a while and should be scheduled for a time of low activity.
 - Creating the initial snapshot set by splitting the mirror so that it is no longer synchronized with the original volume and becomes a point-in-time copy
- Periodically refreshing (resynchronizing) the split-mirror snapshot with the original volume, and then splitting the mirror again, as needed or according to a pre-set schedule

This stage is automated by setting up snapshot schedules using the Enterprise Vault Snapshot Scheduler wizard.
- Using a snapshot set to recover a corrupted Enterprise Vault component

Enterprise Vault components supported by SFW

Table 1-1 lists the Enterprise Vault (EV) components that are supported by SFW.

Table 1-1 Enterprise Vault components supported by SFW



Icon	Name	Description
	Directory Database	The Enterprise Vault Directory database holds configuration information for each site in the Directory (EnterpriseVaultDirectory).
	Monitoring Database	Enterprise Vault has a Monitoring agent on each Enterprise Vault server. The Monitoring agents collect monitoring data at the scheduled intervals, usually every few minutes, and store it in the Enterprise Vault Monitoring database. If multiple EV sites share a Directory database, then they must also share a Monitoring database (EnterpriseVaultMonitoring).

Table 1-1 Enterprise Vault components supported by SFW (*continued*)












Icon	Name	Description
	Reporting database	The Reporting database stores reporting information that is generated from the collected Monitoring data. There is one Reporting database named EnterpriseVaultFSAReporting corresponding to the Directory database.
	Auditing database	The Auditing database stores audit information. There is one Auditing database named EnterpriseVaultAudit corresponding to the Directory database.
	Site	A site comprises one or more Enterprise Vault servers running one or more Enterprise Vault services and tasks to archive items from specified targets. In addition, a site also has a collection of vault stores, archiving policies that define how and when items are to be archived, and Retention Categories that define the duration for which the data can be stored before being deleted.
	Index	The Indexing Service indexes items as they are archived. There is one Index for each archive.
	Vault Store Group	Vault Store Group (VSG) is a collection of Vault Stores that are configured to share data.
	Fingerprint database	A Vault Store Group contains one or more Fingerprint Catalog databases (FDB) to hold a shared item's metadata.
	Vault Store	Enterprise Vault organizes archives in entities called Vault Stores. Vault Stores contain one or more Enterprise Vault partitions. A partition can reside on any of the supported storage media.
	Vault Store database	The Vault Store SQL databases contain information about every archive operation processed for all archives within a Vault Store. Both the Vault Store's database and the Vault Store's files must be complete to be able to retrieve messages from an archive.

Table 1-1 Enterprise Vault components supported by SFW (*continued*)

Icon	Name	Description
	Open Partition	In each Vault Store, there can be only one Open partition. This is the partition in which Enterprise Vault archives data. An Open Partition is the current active Partition in which Enterprise Vault data is being written.
	Ready Partition	Each Vault Store can have a number of Ready Partitions. A Ready Partition is the next available partition to be used.
	Closed Partition	Each Vault Store can have any number of Closed Vault Store Partitions. Enterprise Vault does not archive content into partitions that are closed.

Methods of implementing Quick Recovery snapshots

Symantec Storage Foundation for Windows provides more than one method of implementing Quick Recovery snapshots for Enterprise Vault components.

- Enterprise Vault Snapshot Scheduler
- Enterprise Vault Snapshot and Snapback wizards and the vxsnap command line utility

Table 1-2 summarizes the methods and when you would use them.

Table 1-2 Methods of implementing Quick Recovery snapshots

Tasks	Method	For more information
<ul style="list-style-type: none"> ■ Add a new snapshot set schedule for a component 	From the VEA: Enterprise Vault Snapshot Scheduler Wizard	See “About the Enterprise Vault Snapshot Scheduler Wizard” on page 14.
<ul style="list-style-type: none"> ■ Create a one-time snapshot as needed 	From the VEA: Enterprise Vault Snapshot Wizard and Enterprise Vault Snapback Wizard You can also use the vxsnap utility from the CLI.	See “About the Enterprise Vault Snapshot and Snapback wizards and the vxsnap utility” on page 14.

About the Enterprise Vault Snapshot Scheduler Wizard

You can use the Enterprise Vault Snapshot Scheduler Wizard to add a snapshot schedule for a selected component. With the wizard, you can schedule multiple Enterprise Vault components at a time.

The Enterprise Vault Snapshot Scheduler Wizard does not prepare the snapshot volume. You need to use the Enterprise Vault Prepare Wizard before running the Enterprise Vault Snapshot Scheduler Wizard to schedule a new snapshot set for Enterprise Vault.

As an example, you may configure a daily snapshot for Quick Recovery use and also add a weekly snapshot on a different disk for backup use.

About the Enterprise Vault Snapshot and Snapback wizards and the vxsnap utility

If you need to create an individual snapshot set, you can do so either from the command line, using the `vxsnap` command line utility, or from the VEA console using the Enterprise Vault Snapshot and Snapback wizards.

These methods do not include the capability of scheduling periodic refreshing of the snapshot set. Instead you would need to manually reattach the mirror, allowing it to resynchronize, and then create a snapshot set again from the resynchronized mirror. If you want to keep the snapshot set up to date, you should set up a snapshot schedule using the Enterprise Vault Snapshot Scheduler Wizard.

See [“Scheduling a new snapshot set”](#) on page 32.

The `vxsnap` command can be invoked from any system which is a part of the EV configuration and where the Enterprise Vault Admin service is running. The PowerShell script execution policy should be set to unrestricted and the Veritas Scheduler Service should be configured with users having Administrative privileges.

See [“Preparing for Enterprise Vault snapshots”](#) on page 25.

[Table 1-3](#) shows the Enterprise Vault wizards and corresponding `vxsnap` command keyword options.

Table 1-3 Actions of wizards and vxsnap command

Action	Wizard	vxsnap command line utility
Prepares all dependent components of Enterprise Vault (EV) for a snapshot set	Enterprise Vault Prepare wizard See “Preparing an EV snapshot mirror” on page 30.	<code>vxsnap prepare</code> See “vxsnap prepare” on page 61.

Table 1-3 Actions of wizards and vxsnap command (*continued*)

Action	Wizard	vxsnap command line utility
Creates a snapshot set consisting of snapshots of all the volumes in the specified Enterprise Vault component.	Enterprise Vault Snapshot wizard See “Creating a one-time EV snapshot set” on page 39.	<code>vxsnap create</code> See “vxsnap create” on page 62.
Reattaches and resynchronizes a snapshot set to the production database volumes.	Enterprise Vault Snapback wizard See “Refreshing an EV snapshot” on page 43.	<code>vxsnap reattach</code> See “vxsnap reattach” on page 64.

About the components used in Quick Recovery

SFW Quick Recovery snapshots use Veritas FlashSnap and FastResync technology along with the Microsoft Volume Shadow Copy Service framework.

FlashSnap and FastResync

Veritas FlashSnap provides the ability to create and maintain the on-host point in time copies of volumes that are integral to the snapshot solutions. Both the original and snapshot volume may consist of multiple physical devices, as in the case of RAID 0+1 (Mirrored Striped) volumes. FlashSnap cannot be used with software RAID-5 volumes.

FastResync is a FlashSnap feature that optimizes the resynchronization of a snapshot volume and its original volume. FlashSnap uses FastResync technology to track the changed blocks in an original volume after a snapshot is detached. A Disk Change Object (DCO) volume is automatically created to store a record of these changes. When the snapshot volume is resynchronized with the original volume, only the changed data blocks are written to the snapshot volume. This greatly reduces the time and performance impact of resynchronization which means that a snapshot set can be refreshed with minimal impact to production.

Integration with Microsoft Volume Shadow Copy Service

SFW integrates with the Windows Volume Shadow Copy Service (VSS) as both a VSS Requestor and a VSS Provider. This integration is provided by FlashSnap.

The Volume Shadow Copy Service (VSS) process allows the Enterprise Vault components to be frozen before the snapshot operation occurs and then thawed

immediately after it. This quiescing allows for Microsoft supported and guaranteed persistent snapshots of your data.

FlashSnap integrates with VSS to create a snapshot set containing snapshot volumes of all the volumes associated with Enterprise Vault without taking the databases offline.

VSS framework

There are four components to the VSS framework: Requestor, Writer, Provider, and the Volume Shadow Copy Service itself.

Table 1-4 VSS framework components

Component	Action
Volume Shadow Copy Service	Talks to and coordinates the Requestor, Provider, and Writer.
Requestor	As a Requestor, the vxsnap component of FlashSnap notifies the VSS coordinator to initiate the VSS request to prepare Enterprise Vault for quiescing and later requests that the snap shot process begin.
Writer	As Writers, VSS-enabled applications such as Enterprise Vault respond to requests to prepare and participate in the generation of snapshots, provide success/failure status, and provide information about the application including what is to be backed up and restored, and restore strategy.
Provider	As a Provider, FlashSnap creates the persistent snapshot.

VSS process

FlashSnap integrates with Volume Shadow Copy Service as both a VSS Requestor and a VSS Provider.

The following steps occur, in the order presented, during the snapshot process:

- Acting as a VSS Requestor, FlashSnap notifies Enterprise Vault to put Enterprise Vault components in to backup mode (read-only mode).
- Acting as a VSS Requestor, FlashSnap notifies the VSS coordinator service to prepare for a split-mirror snapshot of SQL or a volume.
- The VSS coordinator service calls the SQL Writer to find out which volumes contain the databases and transaction logs (if the snapshot set involves an SQL database).
- The VSS coordinator service notifies the FlashSnap VSS Provider to prepare for the snapshot.

- Acting as a VSS Requestor, FlashSnap requests that the VSS coordinator service begin the snapshot call.
- The VSS coordinator service notifies the SQL writer to quiesce and freeze the components in preparation for the snapshot (if the snapshot set involves an SQL database).
- The VSS coordinator flushes the file system buffer and then freezes the file system, which ensures that file system metadata is written and that the data is written in a consistent order.
- The VSS coordinator service calls the FlashSnap Provider to create the snapshot by detaching the snapshot volume from the original volume. After the snapshot volume is detached, the FlashSnap Provider informs the VSS coordinator service to proceed.
- The VSS coordinator Service thaws the file system (release the freeze of the file system).
- The VSS coordinator service notifies SQL to thaw (release the freeze) and resume normal I/O (if the snapshot set involves an SQL database).
- Acting as a VSS Requestor, FlashSnap notifies the Enterprise Vault to clear Enterprise Vault components from backup mode (read-only mode).

The following steps occur, in the order presented, during the restore process:

- Acting as a VSS Requestor, FlashSnap notifies the Enterprise Vault to put Enterprise Vault components into backup mode (read-only mode).
- Acting as a VSS Requestor, FlashSnap notifies the VSS coordinator service to prepare for a restore operation.
- The VSS coordinator service calls SQL which prepares for the restore operation (if the snapshot set involves an SQL database).
- The FlashSnap utility restores the snapshot volumes. After the snapback operation completes, the FlashSnap utility informs the VSS coordinator service to proceed.
- The VSS coordinator service notifies SQL to process the post-restore operations (if the snapshot set involves an SQL database)
- Acting as a VSS Requestor, FlashSnap notifies Enterprise Vault to clear all Enterprise Vault components from backup mode (read-only mode).

Preparing to implement Quick Recovery for Enterprise Vault

This chapter includes the following topics:

- [Tasks for preparing to implement Quick Recovery for Enterprise Vault](#)
- [Reviewing the prerequisites](#)
- [Configuring Enterprise Vault storage with Symantec Storage Foundation for Windows](#)
- [Preparing for Enterprise Vault snapshots](#)

Tasks for preparing to implement Quick Recovery for Enterprise Vault

[Table 2-1](#) outlines the high-level objectives and the tasks to complete each objective for preparing to implement Enterprise Vault Quick Recovery.

Table 2-1 Tasks for preparing to implement Enterprise Valult Quick Recovery

Objective	Tasks
See "Reviewing the prerequisites" on page 19.	<ul style="list-style-type: none">▪ Verifying hardware and software prerequisites and storage configuration best practices

Table 2-1 Tasks for preparing to implement Enterprise Vault Quick Recovery (continued)

Objective	Tasks
See “Configuring Enterprise Vault storage with Symantec Storage Foundation for Windows” on page 21.	<ul style="list-style-type: none"> ■ Creating a dynamic disk group ■ Creating dynamic volumes ■ Configuring Enterprise Vault (EV) and using SFW dynamic volumes for EV components
See “Preparing for Enterprise Vault snapshots” on page 25.	<ul style="list-style-type: none"> ■ Invoking the Enterprise Vault Management Shell ■ Configuring Veritas Scheduler Services ■ Starting required VSS Writer and EV services

Reviewing the prerequisites

A Symantec Storage Foundation for Windows (SFW) quick recovery solution can be implemented on either a standalone system or a clustered system.

Note: Quick recovery snapshots of the Enterprise Vault components are supported for Symantec Cluster Server (VCS) on Windows Server 2008.

This solution assumes that Storage Foundation for Windows (SFW) is already installed and configured.

Refer to the *Symantec Storage Foundation and High Availability Solutions Installation and Upgrade Guide* for installation and configuration information for Symantec Storage Foundation for Windows or Symantec Storage Foundation HA for Windows.

Supported software

Quick Recovery snapshots for Enterprise Vault require the following software:

- Symantec Storage Foundation for Windows (SFW) with the FlashSnap option or Symantec Storage Foundation HA for Windows (SFW HA) with the FlashSnap option.

For the latest information on hardware and software supported for Symantec Storage Foundation for Windows (SFW) and Symantec Storage Foundation HA for Windows (SFW HA), see the following compatibility lists:

- For the Hardware Compatibility List (HCL):
<http://www.symantec.com/docs/TECH208993>
- For the Software Compatibility List (SCL):
<http://www.symantec.com/docs/TECH209010>

- Any of the following Enterprise Vault Servers:

- Enterprise Vault 8.0 SP1, SP2, and SP3
- Enterprise Vault 9.0

For the latest compatibility information for Enterprise Vault, see the Symantec Enterprise Vault Compatibility List here:

<http://www.symantec.com/docs/TECH38537>

Storage requirements and best practices

Review the following best practices and requirements for snapshot storage:

- The hardware for Quick Recovery should include sufficient storage to be able to create dynamic volumes on separate disks or LUNs for the following purposes:
 - Databases
 - Transaction logs
 - Enterprise Vault Partitions and Index Locations
 - Split-mirror snapshots of the database and transaction log volumes
- For the split-mirror snapshots, make sure to select disks or LUNs that are not used for production data.
- You can create a snapshot of more than one volume on the same disk or LUN as long as there is sufficient space available.

Configuration requirements and best practices

Review the following configuration requirements and best practices:

- Configuring Enterprise Vault to work with Storage Foundation for Windows requires that Microsoft Windows PowerShell 1.0 or later be installed.
- The system and boot volumes must reside on a separate disk (Harddisk0) from the dynamic volumes used for the Enterprise Vault components and split-mirror snapshots.
- Disk groups must be of a Storage Foundation for Windows 4.0 or later version. Upgrade any disk groups created using an earlier version of Volume Manager for Windows before creating Quick Recovery snapshots.
- Quick Recovery snapshots are supported only on volumes belonging to an SFW dynamic disk group. They are not supported on volumes belonging to a Microsoft Disk Management Disk Group. For more information on Microsoft Disk Management Disk Groups, see *Symantec Storage Foundation for Windows Administrator's Guide*.

- Database and transaction logs must be stored on disks within a single dynamic disk group.
- Database and transaction logs should be on separate disks so that disk failure does not affect anyone of these filegroups.
- User-defined database and transaction logs may not be stored in the same volume as the Enterprise Vault program files or system data files.
- Locate snapshot volumes on separate disks from any database and log volumes so that the snapshot process does not interfere with database operations.
- Locate the snapshot volumes for each component on separate disks from snapshots of other components. This is recommended so that the process of creating the snapshot of one component does not interfere with any operations on another component.

Warning: The snapshot XML files must be stored separately from the volumes that are included in snapshots, otherwise a restore will fail.

- Transaction logs should always be configured in a redundant layout. The preferred software layout is RAID 0+1 (mirrored striped) volumes as this provides better read and write performance than RAID 1 (mirrored) alone. The transaction log will generate the most I/O and thus should use the highest performance disks available.
- The preferred layout for the database is hardware RAID 5, software RAID 1 (mirrored with logging enabled) or software RAID 0+1 (mirrored striped).

Note: FlashSnap is not supported for software RAID 5 volumes.

Configuring Enterprise Vault storage with Symantec Storage Foundation for Windows

To use the SFW Quick Recovery snapshot functionality with Enterprise Vault components, store the components on Symantec Storage Foundation (SFW) dynamic volumes. Configuring Enterprise Vault Server storage with SFW includes the following tasks:

- Creating one or more dynamic disk groups.
- Creating volumes for the databases, transaction logs, Enterprise Vault partitions, index locations, etc.

- Creating new databases, Enterprise Vault partitions, index locations and setting the appropriate paths to point to the new SFW volumes.

If your Enterprise Vault Server environment is already configured with SFW, skip this section.

Creating dynamic disk groups

Create one or more dynamic disk groups.

Note: Disk groups must be of a Storage Foundation for Windows 4.0 or later version. You must upgrade any disk groups created using an earlier version of Volume Manager for Windows before implementing SFW snapshot solutions. Quick Recovery snapshots are supported only on volumes belonging to an SFW dynamic disk group. They are not supported on volumes belonging to a Microsoft Disk Management Disk Group.

Note: If User Access Control (UAC) is enabled on Windows Server 2008 systems, then you cannot log on to VEA GUI with an account that is not a member of the Administrators group, such as a guest user. This happens because such user does not have the "Write" permission for the "Veritas" folder in the installation directory (typically, `C:\Program Files\Veritas`). As a workaround, an OS administrator user can set "Write" permission for the guest user using the Security tab of the "Veritas" folder's properties.

To create a dynamic disk group from the VEA console

- 1 Launch VEA from **Start > Programs > Symantec > Symantec Storage Foundation > Veritas Enterprise Administrator** or, on Windows 2012 operating systems, from the **Apps** menu in the **Start** screen.
Select a profile if prompted.
- 2 Click **Connect to a Host or Domain** and in the Connect dialog box, specify the host name and click **Connect**.
For the local system you can specify **localhost**.
- 3 If prompted to do so, specify the user name, password, and domain for the system.
- 4 In the tree expand the system name and expand the storage agent.
- 5 Right-click **Disk Groups**, and click **New Dynamic Disk Group**.
- 6 On the **Welcome** screen of the New Dynamic Disk Group Wizard, click **Next**.

- 7 Enter a name for the disk group.

Note: A dynamic disk group name is limited to 18 ASCII characters. It cannot contain spaces, slash mark (/), backslash (\), exclamation point (!), angle brackets (< >), or equal sign (=). Also, a period cannot be the first character in the name.

- 8 For an off-host or cluster environment, choose from the following:
 - For a cluster environment, check the **Create cluster group** check box.
 - For an off-host environment, check the **Add private group protection** check box.
- 9 Select the appropriate disks in the Available disks list and click the **Add** button to move them to the Selected disks list.
- 10 Click **Next**.
- 11 Click **Next** to upgrade the selected disks.
- 12 Click **Finish** to create the new disk group.

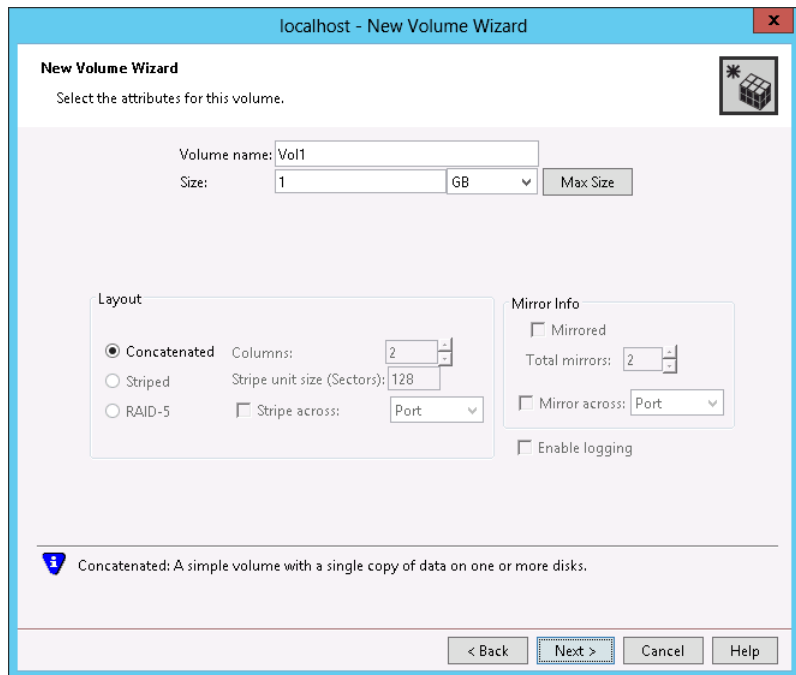
Creating dynamic volumes

Create volumes for Enterprise Vault (EV) components.

To create a dynamic volume from the VEA console

- 1 Launch VEA from **Start > Programs > Symantec > Symantec Storage Foundation > Veritas Enterprise Administrator** or, on Windows 2012 operating systems, from the **Apps** menu in the **Start** screen.
Select a profile if prompted and connect to the appropriate host.
- 2 In the tree, expand the system name, expand the storage agent, and then expand **Disk Groups**.
- 3 Right-click on the disk group in which to create the volumes, and click **New Volume**.
- 4 In the Welcome panel of the New Volume Wizard, click **Next**.
- 5 Select the disks for the volume:
 - Make sure the appropriate disk group name appears in the **Group name** drop-down list.
 - For Site Preference, leave the setting as **Siteless** (the default).

- Specify automatic disk selection (the default) or manual disk selection. To manually select disks, use the **Add** button to move the appropriate disks to the **Selected disks** list. Manual selection of disks is recommended.
 - You may also check **Disable Track Alignment** to disable track alignment for the volume. Disabling Track Alignment means that the volume does not store blocks of data in alignment with the boundaries of the physical track of the disk.
 - Click **Next**.
- 6 Specify the parameters of the volume:



- Enter the volume name.

Note: A volume name is limited to 18 ASCII characters. It cannot contain spaces, slash mark (/), backslash (\), exclamation point (!), angle brackets (< >), or equal sign (=). Also, a period cannot be the first character in the name.

- Enter the size.

- Select the layout.
 - Select the appropriate mirror options.
 - Click **Next**.
- 7 Assign a drive letter to the volume and click **Next**.
- 8 Create an NTFS file system:
- Accept the default **Format this volume**.
 - Click **NTFS**.
 - Select an allocation size.
 - Accept the default file system label, which is the same as the volume name you entered previously or enter a file system label.
 - If desired, select **Perform a quick format**.
 - Click **Next**.
- 9 Review the volume specifications, then click **Finish** to create the new volume.

Pointing the databases and log paths to the SFW volumes

To take a snapshot of any of the Enterprise Vault components with SFW for quick recovery, these components need to reside on the SFW dynamic volumes.

Refer to the Enterprise Vault Server documentation for information about creating new databases, Enterprise Vault partitions, and index locations and setting the paths.

Preparing for Enterprise Vault snapshots

For taking EV snapshots, you must invoke the Enterprise Vault Management Shell to register PowerShell snap-ins, set the execution policy, and then configure Veritas Scheduler Services. You must also start required VSS Writer and EV services.

Make sure the following have been completed before taking Enterprise Vault snapshots:

- See [“Invoking the Enterprise Vault Management Shell”](#) on page 26.
- See [“Configuring the Veritas Scheduler Service”](#) on page 26.
- See [“Starting services required for Enterprise Vault Quick Recovery”](#) on page 27.

Invoking the Enterprise Vault Management Shell

After completing the Enterprise Vault installation tasks, and before taking Enterprise Vault snapshots, you must invoke the Enterprise Vault Management Shell to register PowerShell snap-ins and set the execution policy.

The Enterprise Vault Management Shell can be invoked either prior to or after performing the Prepare operation for snapshot mirrors.

Note: You need to invoke the Enterprise Vault Management Shell only once on a host where you are performing the snapshot command. As a best practice, it is recommended that you invoke the shell once on all the hosts in the Enterprise Vault configuration.

To invoke the Enterprise Vault Management Shell

- 1 Invoke Enterprise Vault Management Shell from **Start > Programs > Enterprise Vault > Enterprise Vault Management Shell** or, on Windows 2012 operating systems, from the **Apps** menu in the **Start** screen.
- 2 Run the following command to set the execution policy:

```
set-executionpolicy unrestricted
```

Warning: When execution policy is unrestricted, PowerShell will run any PowerShell script. This is the least secure setting and has considerable security risks.

Configuring the Veritas Scheduler Service

Configure the Veritas Scheduler Service with administrative privileges on all nodes where you have configured the Enterprise Vault Server.

Perform the following to configure the services.

To configure the Veritas Scheduler Service

- 1 From the **Start** menu (the **Start** screen on Windows 2012 operating systems), click **Administrative Tools**.
Launch Veritas Scheduler Service by clicking **Veritas Scheduler Service**.
- 2 From the Veritas Scheduler Service Properties window, select **Log On**. Disable the **Local System account** option. Enable the **This account** option.
Ensure that the user name is set up with administrative privileges.
Click **OK**.

Starting services required for Enterprise Vault Quick Recovery

To take a snapshot of any of the Enterprise Vault components with SFW for quick recovery, you must make sure to start the required services. These include required Enterprise Vault services and the SQL Server VSS Writer service.

To start the SQL Server VSS Writer and required Enterprise Vault services

- 1 Start "SQL Server VSS Writer" from Windows Services
 Make sure to set the service to start automatically on system start up.
- 2 Ensure that the following configured EV services on the EV servers are started:
 - Enterprise Vault Admin Service
 - Enterprise Vault Directory Service
 - Enterprise Vault Storage Service
 - Enterprise Vault Indexing Service
 - Enterprise Vault Task Controller Service
- 3 Verify that the SQL Writer has started by entering the following command in a command window.

```
C:\Program Files\Common Files\Microsoft Shared\web server
extensions\12\BIN>vssadmin list writers
```

The output from this command displays status of the VSS Writers on the system.

Sample output from the command is as follows:

```
vssadmin 1.1 - Volume Shadow Copy Service
administrative command-line tool
(C) Copyright 2001 Microsoft Corp.
Writer name: 'SqlServerWriter'
    Writer Id: {a65faa63-5ea8-4ebc-9dbd-a0c4db26912a}
    Writer Instance Id:
{3545eff6-197e-40ef-b48f-891cd251f413}
    State: [1] Stable
    Last error: No error
```

Scheduling or creating a snapshot set for Enterprise Vault

This chapter includes the following topics:

- [About scheduling or creating a snapshot set](#)
- [Tasks to schedule a new snapshot set](#)
- [Tasks to create a one-time snapshot set](#)
- [Configuration requirements for snapshots](#)
- [Preparing an EV snapshot mirror](#)
- [Scheduling a new snapshot set](#)
- [Creating a one-time EV snapshot set](#)
- [Refreshing an EV snapshot](#)

About scheduling or creating a snapshot set

You can use the Enterprise Vault Snapshot Scheduler Wizard to add a snapshot schedule for all volumes of a selected component. The scheduler wizard enables you to automate the refreshing of snapshots according to the schedule that you define.

One snapshot set can have multiple EV components. You can also select multiple components that you want to add to the snapshot set.

See [“Enterprise Vault components supported by SFW”](#) on page 11.

At times you may want to create a one-time snapshot of a specific volume or volumes. You can do so using either the `vxsnap` command line utility or from the Veritas Enterprise Administrator (VEA) console using the Enterprise Vault Snapshot and Snapback Wizards.

You must use the Prepare command to prepare the snapshot mirrors before scheduling or creating snapshot sets.

Tasks to schedule a new snapshot set

Table 3-1 outlines the high-level objectives and the tasks to complete each objective.

Table 3-1 Tasks for scheduling a new snapshot set

Objective	Tasks
See "Configuration requirements for snapshots" on page 30.	<ul style="list-style-type: none">Verifying that you have completed the configuration required for scheduling or taking snapshots
See "Preparing an EV snapshot mirror" on page 30.	<ul style="list-style-type: none">Creating snapshot mirrors using the VEA Prepare Wizard or the <code>vxsnap</code> command line utility
See "Scheduling a new snapshot set" on page 32.	<ul style="list-style-type: none">Using the Enterprise Vault Snapshot Scheduler Wizard to create the initial snapshot set and set up the schedule for keeping it refreshed.

Tasks to create a one-time snapshot set

Table 3-2 outlines the high-level objectives and the tasks to complete each objective.

Table 3-2 Tasks for creating a one-time snapshot set

Objective	Tasks
See "Configuration requirements for snapshots" on page 30.	<ul style="list-style-type: none">Verifying that you have completed the configuration required for scheduling or taking snapshots
See "Preparing an EV snapshot mirror" on page 30.	<ul style="list-style-type: none">Creating snapshot mirrors using the VEA Prepare Wizard or the <code>vxsnap</code> command line utility

Table 3-2 Tasks for creating a one-time snapshot set (*continued*)

Objective	Tasks
See “Creating a one-time EV snapshot set” on page 39.	<ul style="list-style-type: none">■ Creating the one-time snapshot set using the VEA Snapshot Wizard or the <code>vxsnap</code> command line utility.

Configuration requirements for snapshots

Make sure that you complete the following configuration requirements before scheduling or taking Enterprise Vault snapshots:

- Install the required hardware and software.
See [“Reviewing the prerequisites”](#) on page 19.
- Set up Enterprise Vault Server for use with Symantec Storage Foundation for Windows (SFW).
See [“Configuring Enterprise Vault storage with Symantec Storage Foundation for Windows”](#) on page 21.
- Invoke the Enterprise Vault Management Shell to set the execution policy to unrestricted.
See [“Invoking the Enterprise Vault Management Shell”](#) on page 26.
- Configure the Veritas Scheduler Service on all Enterprise Vault servers in the Enterprise Vault configuration.
See [“Configuring the Veritas Scheduler Service”](#) on page 26.
- Ensure that required services are running:
See [“Starting services required for Enterprise Vault Quick Recovery”](#) on page 27.
- Ensure that you have disks with enough space to store the snapshot volumes. Each snapshot set requires the same amount of space as the original volumes.

Preparing an EV snapshot mirror

Preparing Enterprise Vault (EV) for snapshot involves preparing all the dependent components of EV. The Prepare operation can be performed at the EV farm, sites, Vault StoreGroups, Vault Stores, or any component level. When you right-click an EV object and select the Enterprise Vault Prepare operation from the context menu, related EV sites, components, etc. within (subordinate to) the EV object are prepared for snapshot mirrors.

Note: You can have only one snapshot volume on a disk for a particular production volume.

Note: If a volume is used for more than one component, it will be snapshot prepared only once when all the components are specified in `vxsnap prepare` command or in Enterprise Vault Prepare Wizard. However, when all the components are separately prepared for snapshot mirrors, then the volume gets prepared many times (once for every component).

The snapshot mirrors remain attached to the original volumes and continue to be updated until you use the Enterprise Vault Snapshot Wizard, the `vxsnap create` command, or the Enterprise Vault Snapshot Scheduler Wizard to create the snapshot set.

Please note the following:

- When an EV site is prepared, the Directory database is also prepared implicitly by the system along with the EV site components.
- When a Vault Store database of a Vault Store is prepared, the Open Partition of that Vault Store is also prepared implicitly by the system.
- When an Open Partition of a Vault Store is prepared, the Vault Store database of that Vault Store is also prepared implicitly by the system.

To prepare the snapshot mirrors, you can use either of the following methods:

- Prepare volumes using the VEA GUI as described in the following procedure.
- Prepare volumes using the CLI
You can use the `vxsnap prepare` command to prepare volumes for snapshot mirrors.
See “[vxsnap prepare](#)” on page 61.

To prepare volumes for EV snapshot mirror using the VEA

- 1 On the VEA console, navigate to the **Storage Agent** in the tree-view and expand the **Enterprise Vault** nodes, under **Applications**.
- 2 Right-click the desired **Enterprise Vault** component and select **Enterprise Vault Prepare** from the context menu.
- 3 The Enterprise Vault Prepare Wizard is launched.
Read the information on the Welcome page. Click **Next**.

- 4 From the Select Component page, select the EV components, sites, Vault Store Groups, Vault Stores, or partitions for which you want to prepare snapshot mirrors.

Additionally, you can also use the keyboard shortcuts to select EV components. Use **Ctrl+A** to select the entire EV farm along with sites and components. Use **Ctrl+Click** to select EV components of your choice. Use **Ctrl+Shift+Arrow Up, Down** keys to select components located at the upper and lower hierarchies in the EV farm.

Click **Next**.

- 5 Review the summary page for description of the selected sites and components that are prepared. Click **Finish** to complete the Prepare operation for the selected components.

Scheduling a new snapshot set

You can use the Enterprise Vault Snapshot Scheduler Wizard to schedule the initial snapshot set and to set up the schedule for keeping it refreshed.

The scheduling of snapshots can be done at the EV farm, sites, Vault Store Groups, Vault Stores, Partitions, or any component level. The wizard can be launched from any component of EV configuration.

When the scheduled snapshots occur, the snapshot mirrors are detached from the original volumes, creating separate on-host snapshot volumes as well as an XML file to store the snapshot volume metadata. The scheduled process integrates with VSS to quiesce the database and then simultaneously snapshot the volumes for EV components. This snapshot is done while the EV components are online and without disrupting the operations. It also allows the Enterprise Vault PowerShell cmdlet to put Enterprise Vault into backup mode. Backup mode ensures that no writes happen on Enterprise Vault components.

Before you run the Enterprise Vault Snapshot Scheduler Wizard to schedule a snapshot set for a database, you must prepare a snapshot mirror for each of the volumes in the database.

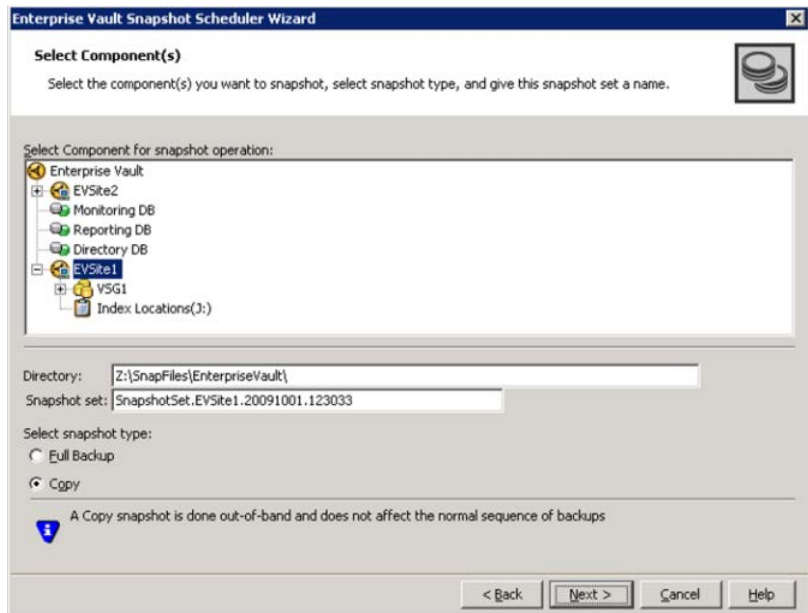
See [“Preparing an EV snapshot mirror”](#) on page 30.

In addition, ensure that you have met the configuration requirements before running the wizard.

See [“Configuration requirements for snapshots”](#) on page 30.

To schedule a snapshot for a selected component

- 1 On the VEA, navigate to the **Storage Agent** node on the left-hand pane and click to expand **Applications**. Right-click **Enterprise Vault** and select **Schedule Enterprise Vault Snapshot** from the context menu.
- 2 Review the information on the Welcome page. Click **Next**.
- 3 On the Select Components page, select the EV components you want to snapshot. Select the snapshot type and give it a name.



Complete the information on the Select Components page as follows:

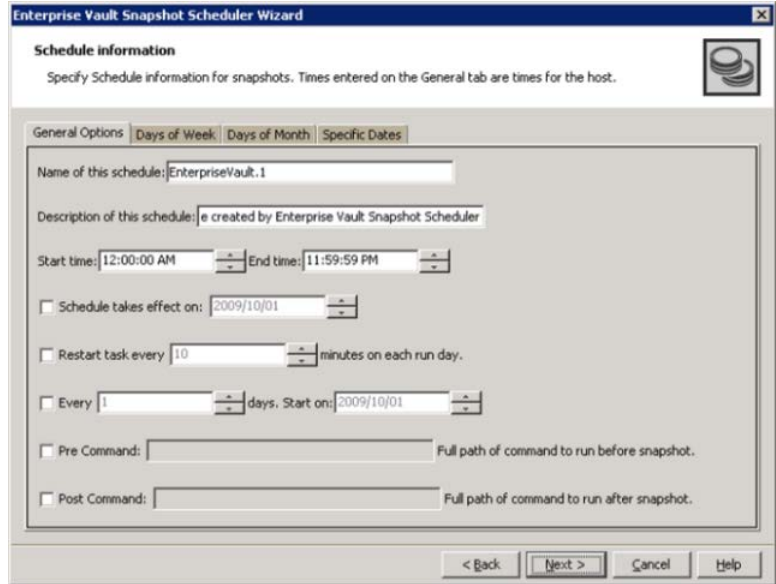
Select component for snapshot operation Select the EV components you want to snapshot. You can select EV Farm, sites, Vault Store Groups, Vault Stores, partitions or any component.

Additionally, you can also use the keyboard shortcuts to select EV components. **Ctrl+ A** selects the entire EV farm along with sites and components. Use **Ctrl+Click** to select EV components of your choice. Use **Ctrl+Shift+Arrow Up, Down** keys to select components located at the upper and lower hierarchies in the EV farm.

Directory	<p>The XML file is stored by default in the directory shown on the screen.</p>
	<p>In a clustered server environment, the XML file must be saved on shared storage to be available from all nodes in the cluster.</p>
	<p>Note: The XML file for the snapshot must be stored separately from the volumes that are included in the snapshots, otherwise a restore will fail.</p>
	<p>The XML file location can be changed in the following two ways:</p>
	<ul style="list-style-type: none">■ First, edit the directory path in the Directory field for this wizard screen.■ Second, change the XML file location. Use a text editor to create a text file named <code>redirect.txt</code>. This text file should contain a single text line specifying the full path to the location of the XML file, for example, <code>G:\BackupSets</code>. Save the <code>redirect.txt</code> file in the default directory <code>C:\Program Files\Veritas\Veritas Volume Manager\VSSXML</code>. If SFW/SFW HA is installed on the D drive, then the path will be the same as above, but on the D drive
	<p>Note: You must not use the volume name or volume path in the <code>redirect.txt</code> file that is involved in the snapshot. If the volume name or path for the snapshot is used, then a restore will fail.</p>
Snapshot set	<p>Enter a name for the snapshot set, for example, <code>billing</code> or accept the default name. The wizard generates a default snapshot set name that includes the term "SnapshotSet", component name, date, and time. Example: <code>SnapshotSet.EV.20091001.124837</code>.</p>
	<p>Note: If multiple components are selected, "EV" is used in the default snapshot set name instead of the component name.</p>
Select snapshot type	<p>You can specify that snapshots be created as either a Full backup or Copy backup type.</p>
	<ul style="list-style-type: none">■ Full Backup A full snapshot affects the sequence of backups and is used when replay logs are needed while restoring. If you want to replay logs in SQL Server as part of restoring a database, a Full backup needs to have been created earlier. When replaying logs, you can replay from the time of the last Full backup.■ Copy A Copy backup does not affect this sequence of log replay and therefore is often used as an "out of band" copy for purposes such as testing or data mining.

Click **Next**.

- 4 In the Schedule Information panel, specify Schedule information for snapshots. This panel has the General Options, Days of Week, Days of Month, and Specific Dates tabs.



You can select either one of these or the combination of all these tabs in order to specify the scheduling information for snapshot sets. Complete the information on this page as follows:

- Select the **General Options** tab and specify the following. Times entered on the General tab are times for the host.

Name of this schedule	Enter a unique name for the snapshot set schedule. This name identifies the snapshot schedule if you later want to view information about the snapshot status. A default name consists of the VSS writer name, the component name and a numbered suffix that increments with each schedule.
Description of this schedule	Optionally, enter a description to help you identify the schedule when you view information about the snapshot status.
Start Time	The time of the day to begin taking snapshots.

End Time	The time of day to end taking snapshots. If a snapshot is in progress it is completed but a new one is not started after the end time.
Schedule takes effect on	The date on which the specified schedule takes effect. The default is the current date.
Restart task every	The interval between snapshots, in minutes. For example, if the interval is 360 minutes and you schedule a snapshot start time of 12 P.M. and an end time of 7 P.M., the snapshot occurs twice. If no interval is specified the snapshot occurs once.
Every	Enable the Every option to have the snapshot schedule continue to occur. Otherwise the schedule applies only for one day. Specify the number of days before restarting the snapshot schedule. For example, 1 day would mean the schedule takes effect daily, 2 days would mean every other day.
Start On	If you enable the Every option, specify the starting date.
Pre Command	Optionally, specify the full path of a command script to run before the scheduled snapshot occurs.
Post Command	Optionally, specify the full path of a command script to run after the snapshot is complete.

- Select the **Days of the Week** tab:
Complete the information on this page as follows:

Days of Week	Select one or more days on one or more weeks of the month. You can click a button at the top of the column to select the entire column or a button to the left of a row to select the entire row. For example, clicking First schedules the snapshots to occur on the first occurrence of all the week days for the month. Selecting the Select All button to select all days in a week and number of schedules available. Deselect All option will disable all selections made on this tab.
--------------	--

- Select the **Days of Month** tab on the Schedule Information page.

Complete the information on this page as follows:

Days of Month

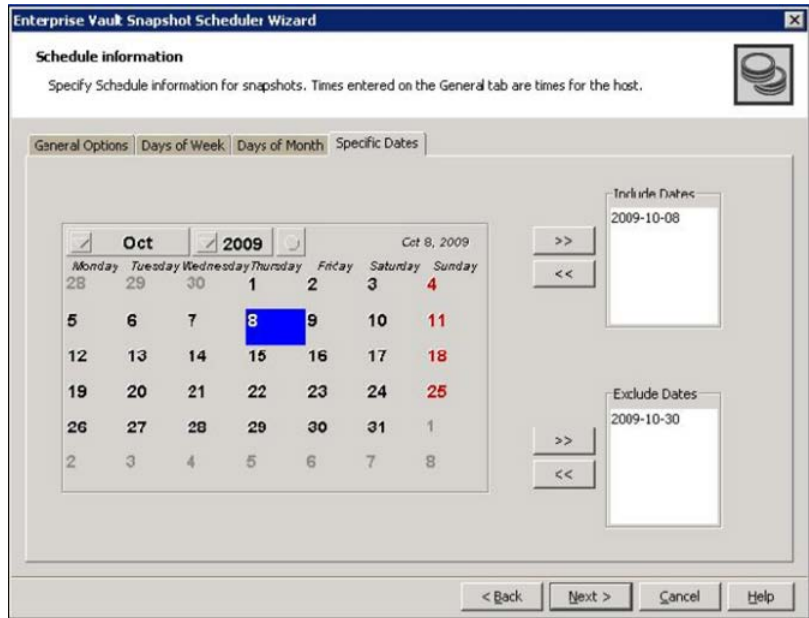
Select one or more days of the month.

The **Select All** button selects all days in a month and schedules. **Deselect All** option will disable all selections.

You can also check the **Last Day** checkbox to schedule the snapshot for the last day of each month.

If two schedules overlap for the same snapshot set, only one snapshot is taken. For example, if you select every Thursday plus the last day of the month, and the last day of the month occurs on Thursday, only one snapshot is taken on Thursday

5 Select the **Specific Dates** tab on the Schedule Information page.



Complete the information on this page as follows:

Specific Dates

Select one or more specific dates to include or exclude from the schedule. The dates are available in *yyyy-mm-dd* format. Example: **2009-10-09**

Excluding a date takes precedence over days scheduled on the other tabs, i.e, the General Options, Days of Week, and Days of Month. For example, if you schedule every Monday on the Days of Week tab, and you exclude Monday October 9 on the Specific Dates tab, the snapshots are not taken on October 9.

Include Dates

Click Forward (>>) arrow keys to add the selected date/dates in the **Include Dates** box. To remove the selected dates, click the Backward arrow keys (<<)

Exclude Dates

Click Forward arrow (>>) keys to add the selected date/dates in the **Exclude Dates** box on the lower right corner. To remove the selected dates, click the Backward arrow keys (<<).

Click **Next**.

- 6 Review the schedule snapshot set specifications on the summary page. Click **Finish** to complete the schedule operation for selected snapshot sets.

Creating a one-time EV snapshot set

SFW provides support for creating snapshots for the Enterprise Vault farm, sites, Vault StoreGroups, Vault Stores, or any component level. You can create snapshots of all volumes associated with the EV components without taking the databases offline and disrupting the database operations.

Creating a one-time snapshot or snapshot set is a two-step process:

- Prepare the snapshot mirrors for the database volume or volumes. If you are creating a snapshot set after a snapback to refresh existing snapshot mirrors, you can skip this step.
See [“Preparing an EV snapshot mirror”](#) on page 30.
- Use either the Enterprise Vault Snapshot Wizard or the `vxsnap create` command to create the snapshot set by detaching the snapshot mirrors from the original volumes. This step creates separate on-host snapshot volumes as well as a snapshot set XML file to store the application and snapshot volume metadata.

Note: The Enterprise Vault Snapshot Wizard and the `vxsnap` utility can be invoked from any node that has the Enterprise Vault Admin service running in the Enterprise Vault Configuration.

When you right-click an EV object and select Enterprise Vault Snapshot from the context menu, the EV objects and components within (subordinate to) the selected EV object are all included in the snapshot. You can also add more Enterprise Vault objects from the objects shown in Enterprise Vault Snapshot wizard.

Please note the following:

- When an EV site is snapshotted, the Directory database is also snapshotted implicitly by the system.
- When a Vault Store database is snapshotted, the Open Partition is also snapshotted implicitly by the system.
- When an Open Partition is snapshotted, the Vault Store database is also snapshotted implicitly by the system.

Review the configuration prerequisites before proceeding with the create snapshot operation for EV.

See [“Configuration requirements for snapshots”](#) on page 30.

To create snapshots using the Enterprise Vault Snapshot Wizard

- 1 On the VEA console, navigate to the **Storage Agent** in the tree-view and expand the **Enterprise Vault** nodes under **Applications**.
- 2 Select the desired EV node for which you want to create a snapshot. Right-click and select **Enterprise Vault Snapshot** from the context menu.

The menu option is also available at the EV site and any component level.

- 3 The Enterprise Vault Snapshot Wizard is launched. Read the information on the Welcome page and click **Next**.
- 4 On the Select Component page is select components for snapshot sets.

Complete the information on this page as follows:

Select Component for snapshot operation Select the component for the snapshot set

Additionally, you can also use the keyboard shortcuts to select EV components. **Ctrl+ A** selects the entire EV farm along with sites and components. Use **Ctrl+Click** to select EV components of your choice. Use **Ctrl+Shift+Arrow Up, Down** keys to select components located at the upper and lower hierarchies in the EV farm.

Directory

The wizard creates the snapshot set metadata XML file. The XML metadata file is stored by default in the directory shown on the screen.

Note: The XML file for the snapshot must be stored separately from the volumes that are included in the snapshots, otherwise a restore will fail.

The XML file location can be changed in the following two ways:

- First, edit the directory path in the Directory field for this wizard screen.
- Second, change the XML file location. Use a text editor to create a text file named `redirect.txt`. This text file should contain a single text line specifying the full path to the location of the XML file, for example, `G:\BackupSets`. Save the `redirect.txt` file in the default directory `C:\Program Files\Veritas\Veritas Volume Manager\VSSXML`. If SFW/SFW HA is installed on the D drive, then the path will be the same as above, but on the D drive.

Note: You must not use the volume name or volume path in the `redirect.txt` file that is involved in the snapshot. If the volume name or path for the snapshot is used, then a restore will fail.

Select snapshot type

Select the snapshot type. You can specify that snapshots to be created as either a Full Backup or Copy.

- Full Backup

Full Backup is used to restore an Enterprise Vault component. If you want a replay log for restoring a component, you should select the Full Backup option. When replaying logs, it replays from the last time of the last Full Backup.

- Copy

A Copy does not affect the sequence of log replay and therefore is often used as an "out of band" copy for purposes such as testing or data mining.

Click **Next**.

5 The summary page is displayed.

Review the specifications of the snapshot set and click **Finish** to complete the snapshot operation for the selected components.

To create the snapshot set from the command line

- ◆ Type the command, as in the following examples:

```
> vxsnap -x test.xml create
  writer=EnterpriseVault
  site=site1/vsg=vsg1/vs=vs1
  site=site2
  /component=(Index Locations (V:))
```

This example creates a snapshot of vault store "vs1" of site1/vsg1, "Index Location (V:)" of site2 and component "Directory DB". The XML file, test.xml, is used to store the VSS metadata that identifies the snapshot. This file is used in the command to reattach the snapshot to resynchronize it and in the command to recover the database using the snapshot.

```
> vxsnap -x test.xml create
  writer=EnterpriseVault
  site=site1
```

This example makes a complete snapshot of site1 (including the directory database).

The complete syntax of the `vxsnap create` command is:

```
vxsnap -x <filename> create writer=<WriterName>
[site=<SiteName>[/VSG=<VSGName> [VS=<VSName>]]]
[[/]component=<ComponentName>] [backuptype=FULL|COPY] [-o]
```

The *WriterName* and *ComponentName* are required. The component name is the name of the Enterprise Vault component. You can use either a Full backup or Copy backup for restoring from a snapshot (recovery). However, if you want to replay logs as part of restoring a database, a Full backup needs to have been created earlier. When replaying logs, you can replay from the time of the last Full backup. A Copy backup does not affect this sequence of log replay and therefore is often used as an "out of band" copy for purposes such as testing or data mining.

Note: Any text string that contains spaces must be enclosed in quotation marks.

Refreshing an EV snapshot

Once a snapshot set has been created, it can be refreshed quickly since you do not have to prepare a mirror in order to refresh it. To refresh the snapshot set you need to perform the following tasks:

- Reattach (snapback) the snapshot
This operation reattaches and resynchronizes an existing snapshot set so that it matches the current set of its original database.
You can perform this operation from either the VEA GUI, using the Enterprise Vault Snapback Wizard, or from the command line, using `vxsnap reattach`. See the following procedures.

Note: The Enterprise Vault Snapback option on the VEA is available only on the Enterprise Vault node in the Application view. Other EV nodes such as the Vault Store Group, Vault Store, Partition, Index etc. do not have this option.

- Create the refreshed snapshot set using either the Enterprise Vault Snapshot Wizard or the `vxsnap create` command
See [“Creating a one-time EV snapshot set”](#) on page 39.

Note: The Enterprise Vault Refresh option available in the VEA console from the Application object refreshes the display of the application and components. It does not refresh the snapshot set.

To reattach snapshot sets using the VEA wizard

- 1 Except the VEA GUI, close all Explorer windows, applications, or any third-party system management tools that may be accessing the snapshot set.
- 2 On the VEA console, navigate to the **Storage Agent** node in the tree-view and expand the **Enterprise Vault** node under **Applications**.
- 3 Right-click the **Enterprise Vault** node and select **Enterprise Vault Snapback** from the context menu.
- 4 The Enterprise Vault Snapback Wizard is displayed. Review the information on the Welcome page and click **Next**.

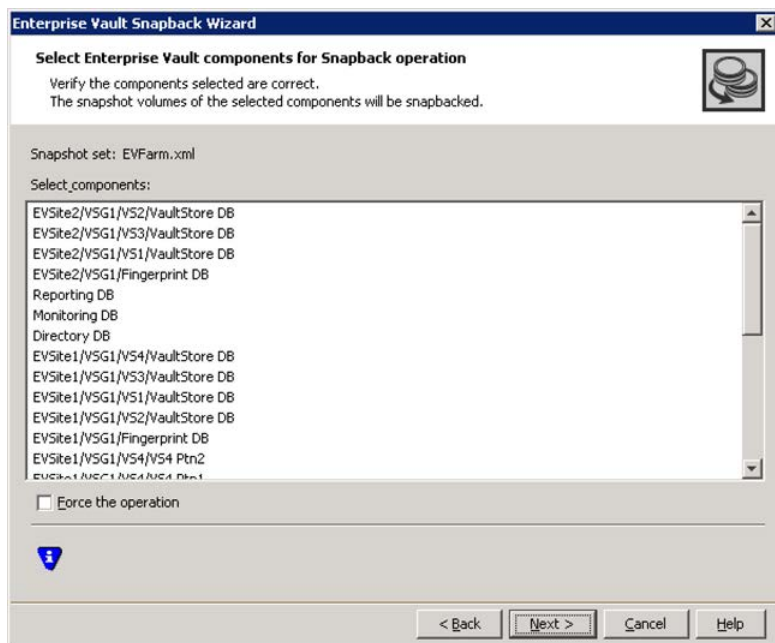
- 5 On the Select Snapshot Set page, select the snapshot set that needs to be snapbacked or reattached.

Complete the information on this page as follows:

- Directory Displays the directory where snapshot sets are stored. It shows the XML files from either the default XML file location or path mentioned in the redirect.txt. However, if you want to change the directory then specify the directory and click **Update** to refresh the XML or snapshot set files.
- Snapshot Sets The XML metadata file contains all required information needed to snapback the snapshot set, including the names of the database and transaction log volumes. Click the appropriate header to sort the list of available files by **File Name** or **Creation Time**. This file is deleted after the snapback operation has completed successfully for all components. If there is partial snapback, the file will get updated with rest of the components.

Click **Next**.

- 6 From the Select Components page, select the components.



Complete the information on this page as follows:

- | | |
|---------------------|---|
| Snapshot set | The selected snapshot set name is displayed. Example:
EVFarm.xml |
| Select components | Select the components that need to be snapbacked. The volumes of selected components are snapbacked. |
| Force the Operation | Enable this checkbox: <ul style="list-style-type: none">■ to override open handles of the volumes in the selected components■ if any of the selected volumes overlaps with the non-selected components in the snapshot |

- 7 Verify that the snapback specifications are correct on the summary page and click **Finish** to complete the reattach operation.

To reattach an EV snapshot set from the command line

- 1 Close all Explorer windows, applications, or third-party system management tools that may be accessing the snapshot set.
- 2 Type the command, as in the following example:

```
> vxsnap -x snapdata.xml reattach  
writer=EnterpriseVault  
site=site1/vsg=vsg1/vs=vs1 site=site2  
/component=(Index Locations (V:))  
/component="Directory DB"
```

This command uses the information in the XML file to reattach and resynchronize all the volumes for the vault store vs1 of site1/vsg1, "Index Locations (V:)" of site2 and "Directory DB".

Note: To reattach all the components in the snapshot set, use `vxsnap -x snapdata.xml reattach writer=EnterpriseVault`. The XML file is deleted after the reattach operation has reattached all the components in the snapshot set.

The snapshot volumes remain synchronized with the original volumes until the `vxsnap create` command is issued.

The complete syntax for the `vxsnap reattach` command is:

```
vxsnap -x Filename [-f] [-b] reattach  
writer=<WriterName>[site=<SiteName>  
[/VSG=<VSGName> [VS=<VSName>]]]  
[[/]]component=<ComponentName>
```

Maintaining or troubleshooting snapshots

This chapter includes the following topics:

- [Viewing the status of scheduled snapshots](#)
- [Troubleshooting scheduled snapshots](#)
- [Deleting or modifying schedules](#)
- [Synchronizing schedules after adding a cluster node](#)

Viewing the status of scheduled snapshots

If a scheduled snapshot fails for some reason, the scheduler process will attempt to rerun it. You may want to verify that scheduled snapshots completed successfully. From the VEA console, you can view snapshot results.

To view a scheduled snapshot status

- 1 From the VEA console, navigate to the system where the production volumes and snapshot mirrors are located.
- 2 Expand the system node and the Storage Agent node.
- 3 Click **Scheduled Tasks** to view all the applications that have schedules.
- 4 Select the application for which you scheduled the snapshot. The scheduled snapshots are listed in the pane on the right.

If you have just configured the schedules and they are not yet displayed, right-click the Storage Agent node and click **Refresh** to update the display.

- 5 Choose one of the following:

- To view the status of all scheduled jobs, right-click the selected application and click **All Job History**.
 - To view the status of a particular schedule, right-click the snapshot schedule name and click **Job History**.
- 6 In the Job History dialog box, view the schedule information.
- You can sort listed schedules by clicking the column headings. The Status column shows if the snapshot completed successfully.

Troubleshooting scheduled snapshots

When scheduling snapshots using the Quick Recovery Configuration Wizard or the VSS Snapshot Scheduler Wizard, you can use the information in the following table to help avoid problems or troubleshoot situations.

Situation	Resolution
Snapshots do not occur on a scheduled date.	The date may have been excluded under "Specific Dates" on the schedule. Excluding a date takes precedence over other days scheduled.
A snapshot is not taken on the date that you create the schedule, although that date is specified as the "Schedule takes effect on date".	<p>The date shown in the Schedule takes effect on field is used as a run day only if no other run days are specified. If you specify other run days, the schedule starts running on the earliest day specified.</p> <p>If you want the current date included in a schedule, specify it as an Include date on the Specific Dates tab.</p>
A scheduled snapshot does not occur for an imported template schedule.	<p>If you import a template that uses the current date as the "takes effect on" date, but part of the schedule cannot be implemented for the current date, the effective date is shifted to the following day.</p> <p>For example, if the schedule includes two daily snapshots, one in the morning and one at night, and you import the schedule in the afternoon, neither of the snapshots occur on the current date. Both occur the following day.</p>

Situation

Resolution

While running the Quick Recovery Wizard to modify template settings, the existing settings are not displayed.

If a scheduled snapshot operation is occurring on the selected object at the same time that you select the object in the wizard, the wizard is temporarily unable to display the existing settings.

You can try running the wizard later.

A schedule is unavailable to be edited in the Quick Recovery Wizard.

Expired schedules cannot be edited.

Instead, delete the expired schedule and add a new one.

You want to use the VSS Scheduler wizard but the Applications node is not shown in the VEA.

You may need to refresh the VEA display to see the node.

For SQL, you must manually start the SQL Server VSS Writer Service. Then right-click the Storage Agent node in the VEA and click Refresh.

Drive letters assignments for snapshot volumes do not occur.

If time elapses between when you use the wizard to assign drive letters and when the snapshot operation occurs, a drive letter you assigned may become unavailable. When this occurs, the snapshot operation is performed, but no drive letters are assigned.

You can assign or change drive letters or mount paths in Veritas Enterprise Administrator.

A scheduled snapshot fails after you have done a manual snapback (reattach) of one or more of the snapshot volumes in the snapshot set.

When a snapback is done manually for a volume rather than by using the VSS Snapback wizard or allowing the scheduler to handle it, the XML metadata file is not deleted. To take the next scheduled snapshot, the scheduler attempts to reattach all the volumes specified in the XML metadata file and fails because one or more are already reattached. Therefore, the snapshot also fails.

To ensure that the next scheduled snapshot works correctly, use the VSS Snapback wizard (or the vxsnap utility) to reattach using the XML file.

Situation

Two databases are on the same volume. You run the Quick Recovery wizard to schedule the first database. You then run it again to schedule a snapshot for the second database on the same disk. But the mirror preparation for the first database is not yet complete.

The following problems can occur:

- When running the wizard, the second time, it does not update the available disk space shown for the disk where the first snapshot is scheduled.
- Mirror preparation for the second database fails.

Resolution

You can choose from the following ways to avoid these problems:

- Include both databases in the snapshot when running the wizard the first time.
- Select a different disk for the second snapshot mirror when running the wizard the second time.
- Wait for the mirror preparation for the first snapshot to finish before running the wizard to schedule the second snapshot.

In addition, when troubleshooting, you may want to review the following logs.

If a schedule fails, check the scheduler service logs in the following folder:

```
C:\Program Files\Veritas\Veritas Volume Manager\logs\SchedService.log
```

If a snapshot fails, check the VxSnap.log file in the following folder:

```
C:\Program Files\Veritas\Veritas Volume Manager\logs
```

Quick Recovery Configuration wizard log files are located in the following path:

```
C:\ProgramData\Veritas\winsolutions\log
```

Deleting or modifying schedules

You can delete or modify a schedule that you created with the Quick Recovery Configuration Wizard by running the wizard again and deleting or editing the schedule on the Snapshot Schedule panel.

You cannot use the Quick Recovery Configuration Wizard to delete or modify schedules created from the VEA console.

Note: You cannot modify a schedule that has expired.

You can also delete (but not modify) a schedule from the VEA console.

Note: The VEA can delete snapshot schedules only; it does not delete mirror preparation scheduled with the Quick Recovery Configuration Wizard. In addition, deleting a snapshot schedule using the VEA does not update template settings created with the Quick Recovery Configuration Wizard.

To delete a schedule from the VEA

- 1 From the VEA console, navigate to the system where the production volumes and snapshot mirrors are located.
- 2 Expand the **System** node and **StorageAgent** node. Select and click to expand the **Scheduled Tasks > Exchange** node.

The scheduled snapshots are listed on the right pane.
- 3 Right-click the name of the snapshot schedule and select **Delete Schedule**.

Synchronizing schedules after adding a cluster node

In a cluster environment, you may add a cluster node after you set up snapshot schedules with the Quick Recovery Configuration Wizard.

In such a case, you can ensure that the schedules are available on the new node by running the Quick Recovery Configuration Wizard again.

To synchronize schedules after adding a node:

- 1 From the **Start** menu (the **Start** screen on Windows 2012 operating systems), type **Run**, and then press **Enter** to open the **Run** dialog box.

In the **Run** dialog box, type **scc**, and then click **OK** to launch the Solutions Configuration Center (SCC).

Launch the Quick Recovery Configuration Wizard from the Solutions Configuration Center.
- 2 Continue through the wizard until the Synchronizing Schedules panel shows that synchronization between cluster nodes is complete.
- 3 Click **Cancel** to exit the wizard.

Recovering Enterprise Vault components

This chapter includes the following topics:

- [About recovering an Enterprise Vault Server component](#)
- [Tasks for recovering an Enterprise Vault Server component](#)
- [Prerequisites for recovering an Enterprise Vault Server component](#)
- [Types of recovery](#)
- [Recovering using snapshots without log replay](#)
- [Restoring snapshots and manually applying logs](#)
- [Post-recovery steps](#)

About recovering an Enterprise Vault Server component

You can use the on-host Quick Recovery snapshot set to quickly recover a component after logical corruption.

You can also use a snapshot set to recover a component after production volumes are lost due to hardware failure. This recovery assumes that the failure does not affect the disk or disks where the snapshot set volumes are located.

You can use either the Enterprise Vault Restore Wizard from the Veritas Enterprise Administrator (VEA) console or the `vxsnap restore` command. Both of these methods integrate with VSS and Enterprise Vault (EV) for putting EV into backup mode. It takes the help of Enterprise Vault PowerShell cmdlet to put EV into backup mode. Backup mode ensures that no writes happen on EV components.

Tasks for recovering an Enterprise Vault Server component

Table 5-1 outlines the high-level objectives and the tasks to complete each objective. The particular task required depends on the type of recovery you are using.

Table 5-1 Tasks for recovery using Quick Recovery snapshots

Objective	Tasks
See “Prerequisites for recovering an Enterprise Vault Server component” on page 53.	<ul style="list-style-type: none"> Verifying the prerequisites for using Enterprise Vault recovery
See “Types of recovery” on page 53.	<ul style="list-style-type: none"> Understanding the types of recovery
See “Recovering using snapshots without log replay” on page 54.	<ul style="list-style-type: none"> Recovering to a specified point in time using the Enterprise Vault Restore Wizard or the <code>vxsnap restore</code> utility
See “Restoring snapshots and manually applying logs” on page 56.	<ul style="list-style-type: none"> Recovering to the time of the snapshot set using the Enterprise Vault Restore wizard or the <code>vxsnap restore</code> utility
See “Post-recovery steps” on page 59.	<ul style="list-style-type: none"> Refreshing the snapshot set

Prerequisites for recovering an Enterprise Vault Server component

You can use the Enterprise Vault Restore Wizard or `vxsnap restore` command line utility to recover EV components from a snapshot set. Both the snapshot set and the snapshot set XML metadata file should be available.

Note: In case of hardware failure, ensure that the snapshot volumes are available for implementing recovery procedures on EV components.

Types of recovery

Table 5-2 gives an overview of the options you can select for recovery. The options are available from either the Enterprise Vault Restore Wizard or the `vxsnap restore` command.

Table 5-2 Recovery options

Selected option	Database state after recovery	Description
Recovery without logs	online	<p>Restore to the time of the snapshot set.</p> <p>Database and transaction log volumes are restored from the specified snapshot set database and log volumes. No additional transaction logs are applied.</p>
No Recovery	loading	<p>Restore the snapshot set and then manually apply logs in SQL.</p> <p>Restores the database and transaction log volumes from the specified snapshot set and leaves the database in a loading state. To bring the database back to an operational state, you must manually apply your backup transaction logs within SQL Server to the desired point in time.</p> <p>Before using this option, you must back up your transaction logs within SQL Server. This log operation requires that at least one Full backup was created earlier.</p>

Recovering using snapshots without log replay

The following procedure uses the Recovery option. It restores the component database from the snapshot set volumes to the time of the snapshot set. The component database and transaction log volumes are restored but no additional transaction logs are applied.

Note: The Recovery option is applicable only for EV database components and not for EV Index and Partitions.

To recover EV components without log replay using the VEA

- 1 Close the SQL GUI, Explorer windows, applications, consoles (except the VEA), or any third-party system management tools that may be accessing the EV component volumes.

It is recommended to bring the database offline.

- 2 On the VEA, navigate to the **Storage Agent** node on the left-hand pane and click to expand **Applications**. Right-click **Enterprise Vault** and select **Enterprise Vault Restore** from the context menu.
- 3 Review the information on the Welcome page and click **Next**.
- 4 Select the snapshot set XML metadata file to be used for this operation and click **Next**.

The XML metadata file contains all required information needed to restore the snapshot set. Click the appropriate header to sort the list of available files by **File Name** or **Creation Time**.

- 5 On the Select Restore Type panel, select **Recovery**.



Complete the information on this page as follows:

- | | |
|--|--|
| Recovery with missing original volumes | Enable the checkbox if one or more original volumes are missing. |
| Forcefully close any open handles | Enable the checkbox if some EV component volumes have open handles. This will forcefully close any open handles of the volumes to be restored. |

Click **Next**.

- 6 On the Select Enterprise Vault components for Restore operation page, select the component or components that you want to restore using the Recovery option.

The original volumes of selected components are restored from the snapshot volumes. Click **Next**.

- 7 Verify the snapshot restore specifications on the summary page and click **Finish**.

The database is restored to the time the snapshot set was created or last refreshed. If you took it offline earlier, bring it back online.

To recover EV components without log replay using the `vxsnap restore` command

- 1 Close the SQL Enterprise Manager GUI and all Explorer windows, applications, consoles, or third-party system management tools that may be accessing the volumes.

It is also recommended to bring the component database offline.

- 2 Type the command as in the following example:

```
vxsnap -x billing_DB.xml restore RestoreType=RECOVERY  
Writer=EnterpriseVault site=sitel/vsg=vsg1/vs=vs1  
component="Directory DB"
```

where `billing_DB.xml` is the name of the metadata file generated by the `vxsnap create` command. The volumes in the snapshot set are restored and the component database is left in an operational state. The component database is restored to the time the snapshot set was created or last refreshed. If you took it offline earlier, bring it back online.

Restoring snapshots and manually applying logs

The following procedure uses the **No Recovery** option to restore the component database from the component database and log snapshot volumes. Selecting this option leaves the component database in a loading state. You can then manually apply backed up transaction logs to recover the component database to the desired point in time.

Note: The No Recovery option is applicable only for EV database components and not for EV Index and Partitions.

You can use either the Enterprise Vault Restore Wizard from the VEA console or the `vxsnap restore` command.

Warning: Before you begin, use your preferred method to backup the transaction logs within SQL Server. You must use the "overwrite existing media" option to create uniquely-named backup files.

To restore EV components using the No Recovery option in the VEA

- 1 Ensure that you have backed up the transaction logs within SQL Server using the "overwrite existing media" option to create uniquely-named backup files.
- 2 Close the SQL GUI, all Explorer windows, applications, consoles (except the VEA console), or any third-party system management tools that may be accessing the EV component volumes.

It is also recommended to bring the database offline.

- 3 On the VEA, navigate to the **Storage Agent** on the left-hand pane and click to expand **Applications**. Right-click **Enterprise Vault** and select **Enterprise Vault Restore** from the context menu.
- 4 Review the information on the Welcome page and click **Next**.
- 5 Select the snapshot set XML metadata file to be used for this operation and click **Next**.

The XML metadata file contains all required information needed to restore the snapshot set, including the names of the database and transaction logs volumes. Click the appropriate header to sort the list of available files by **File Name** or **Creation Time**.

- 6 On the Select Restore Type panel, select **No_Recovery**.



Complete the information on this page as follows:

Forcefully close any open handles Enable this checkbox if some EV component volumes have open handles. This will forcefully close any open handles of the volumes to be restored.

Click **Next**.

- 7 On the Select Enterprise Vault components for Restore operation page, select the EV component or components that you want to restore.

The original volumes of selected components are restored from the snapshot volumes.

- 8 Verify the snapshot restore specifications for No Recovery option on the summary page and click **Finish**.

The component database and log snapshot volumes are restored and the component database is left in a loading state.

- 9 Use your preferred method to manually restore the backup transaction logs to the desired point in time and then bring the component database back online.

To restore using the No Recovery option with the `vxsnap restore` command

- 1 Ensure that you have backed up the transaction logs within SQL Server using the "overwrite existing media" option to create uniquely-named backup files.
- 2 Close the SQL GUI and all Explorer windows, applications, consoles or third-party system management tools that may be accessing the database volumes. It is also recommended to bring the database offline.

- 3 Type the command as in the following example:

```
> vxsnap -x billing_DB.xml restore RestoreType=NO_RECOVERY  
Writer=EnterpriseVault site=site1/vsg=vsg1/vs=vs1  
component="Directory DB"
```

where `billing_DB.xml` is the name of the metadata file generated by the `vxsnap create` command.

The component database and log snapshot volumes are restored and the component database is left in a loading state.

- 4 Use your preferred method to manually restore the backup transaction logs to the desired point-in-time and bring the database online.

Post-recovery steps

After you have performed any of the recovery methods, create a new snapshot set.

See [“Scheduling a new snapshot set”](#) on page 32.

See [“Creating a one-time EV snapshot set”](#) on page 39.

Vxsnap utility command line reference for Enterprise Vault

This chapter includes the following topics:

- [About the Vxsnap utility](#)
- [Vxsnap keywords](#)

About the Vxsnap utility

The command line utilities are available in the Symantec Storage Foundation for Windows installation directory.

The vxsnap utility integrates with Windows Volume Shadow Copy Service (VSS) to create split-mirror snapshots of all the volumes in the specified component.

Note the following requirements:

- Disk groups must be of a Storage Foundation for Windows 4.0 or later version. You must upgrade any disk groups created using an earlier version of Volume Manager for Windows before using the vxsnap utility
- The CLI commands run only on the server. They will not run on the Symantec Storage Foundation for Windows client.
- The vxsnap utility can be invoked from any node that has Enterprise Vault Admin service running in the Enterprise Vault Configuration.
- For Windows Server 2008, all CLI commands must run in the command window in the "run as administrator" mode.

Vxsnap keywords

The `vxsnap` utility has the following keywords:

<code>prepare</code>	Creates snapshot mirrors of the volumes in the specified component. The snapshot mirrors remain attached to and synchronized with the original volumes. Note: Either the <code>prepare</code> or <code>start</code> keyword may be used in the CLI; however <code>prepare</code> is recommended.
<code>create</code>	Creates simultaneous snapshot of all volumes in the specified component, providing a point-in-time snapshot set.
<code>reattach</code>	Reattaches and resynchronizes an existing snapshot set to the original database volumes.
<code>restore</code>	Restores a database from a snapshot set.

You can view an online description of the command syntax by typing the following:

```
vxsnap keyword -?
```

vxsnap prepare

Creates snapshot mirrors of the volumes in the specified site, vault store group, vault store, or component. The snapshot mirrors remain attached to and synchronized with the original volumes.

Note: If a volume is used for more than one component, it will be snapshot prepared only once when all the components are specified in `vxsnap prepare` command. However, when all the components are separately prepared for snapshot mirrors, then the volume gets prepared many times (once for every component).

Syntax

```
vxsnap prepare [-b] writer=<WriterName>  
[site=<SiteName>[/VSG=<VSGName>[/VS=<VSName>]]]  
[[/]component=<ComponentName>]
```

Attributes

The following attributes apply:

<code>[-b]</code>	Run the process as a background process.
<code>writer=<WriterName></code>	Unique ID of the VSS writer, for example, EnterpriseVault. Required if you specify the component.
<code>site=<SiteName></code>	Name of the Enterprise Vault Site.
<code>VSG=<VSGName></code>	Name of the Enterprise Vault Store Group
<code>VS=<VSName></code>	Name of the Enterprise Vault Store
<code>component=<ComponentName></code>	Name of the Enterprise Vault component. For example, Vault Store database, Fingerprint database, or Volume Component, such as index, partitions, etc.

Note: Any text string that contains spaces must be enclosed in quotation marks.

Example

```
vxsnap prepare writer=EnterpriseVault  
site=site1/vsg=vsg1/vs=vs1 site=site2/component="Index  
Location (V:)" component="Directory DB"
```

The above command prepares all the volumes for a snapshot for the Vaultstore "vs1" of site1/vsg1, "Index Location (V:)" of site2 and "Directory DB".

vxsnap create

Creates snapshot of the specified volume(s) or Enterprise Vault component. Allows volumes to be snapshotted simultaneously.

Syntax

```
vxsnap [-x <Filename>] create writer=<WriterName>  
[site=<SiteName>[/VSG=<VSGName>[/VS=<VSName>]]]  
[[/]component=<ComponentName>] [backuptype=<backuptype>]  
[-O]
```

Attributes

The following attributes apply:

<code>-x <Filename></code>	Indicates the name to be assigned to the XML metadata file that will be created with the command. The file name must include the ".xml" extension. To specify a location other than the default location for the file, you must enter the full path for the file (e.g. J:\XML\limage1.xml).
<code>writer=<WriterName></code>	Unique ID of the VSS writer, for example, EnterpriseVault. Required if you specify the component.
<code>site=<SiteName></code>	Name of the Enterprise Vault site.
<code>VSG=<VSGName></code>	Name of the Enterprise Vault Store Group.
<code>VS=<VSName></code>	Name of the Enterprise Vault Store.
<code>component=<ComponentName></code>	Name of the Enterprise vault component. For example, Vault Store database, Fingerprint database, or Volume component, such as index, partitions, etc.
<code>backuptype=FULL COPY</code>	Specifies the type of backup, either a Full or Copy. If no option is specified then Copy is the default.
<code>-o</code>	Allows an existing XML file of the same name to be overwritten. If <code>-o</code> is not specified, then the <code>vxsnap create</code> command does not overwrite an existing XML file of the same name and the operation fails.

Note: Any text string that contains spaces must be enclosed in quotation marks.

Examples

```
vxsnap -x snapdata.xml create writer=EnterpriseVault  
site=site1/vsg=vsg1/vs=vs1 site=site2/component="Index  
Location (V:)" component="Directory DB"
```

The above command creates a snapshot of Vaultstore "vs1" of site1/vsg1, "Index Location (V:)" of site2 and "Directory DB".

To make a snapshot of the complete site1, run the following command:

```
vxsnap -x snapdata.xml create writer=EnterpriseVault site=site1
```

The above command makes a complete snapshot of site 1 including the directory database.

vxsnap reattach

Reattaches and resynchronizes the snapshot volumes in the snapshot set to the original Enterprise Vault component volumes.

Syntax

```
vxsnap -x <Filename> [-f] [-b] reattach  
writer=<WriterName>  
[site=<SiteName> [/VSG=<VSGName> [/VS=<VSName>]]]  
[[/]component=<ComponentName>]
```

Attributes

The following attributes apply:

<code>-x</code> <i>Filename</i>	The file created by the <code>vxsnap create</code> command. Each snapshot set must have a unique name for the metadata file. Note: This file is deleted after the reattach operation has completed successfully.
<code>-f</code>	Forces the reattach. Make sure the volume is not in use by another application before using this command. Use this option with care.
<code>-b</code>	Resynchronizes the volume in the background. A new snapshot cannot be made until the resynchronization is complete.
<code>writer=<WriterName></code>	Unique ID of the VSS writer, for example, EnterpriseVault or the GUID for the writer.
<code>site=<SiteName></code>	Name of the Enterprise Vault site.
<code>VSG=<VSGName></code>	Name of the Enterprise Vault Store Group.
<code>VS=<VSName></code>	Name of the Enterprise Vault Store.
<code>component=<ComponentName></code>	Name of the Enterprise vault component. For example, Vault Store database, Fingerprint database, or volume component such as Index, Partitions, etc.

Example

```
vxsnap -x snapdata.xml reattach writer=EnterpriseVault  
site=site1/vsg=vsg1/vs=vs1 site=site2/component="Index  
Location (V:)" component="Directory DB"
```

The above command reattaches all snapshot volumes for Vaultstore "vs1" of site1/vsg1, "Index Location (V:)" of site2 and "Directory DB".

Note: Any text string that contains spaces must be enclosed in quotation marks.

vxsnap restore

Uses the snapshot volumes in a snapshot set created by the `vxsnap create` command to recover a corrupted or missing Enterprise Vault component.

Exclusive access to the Enterprise Vault component is required for this operation.

Before using this command verify that the source volumes and the snapshot volumes are not in use.

Syntax

```
vxsnap -x <Filename> [-f] [-b] [-r] [-a] restore  
writer=<WriterName>  
[site=<SiteName>[/VSG=<VSGName>[/VS=<VSName>]]]  
[[/]/component=<ComponentName>]  
restoreType={RECOVERY|NO_RECOVERY}
```

Attributes

The following attributes apply:

-x <i>Filename</i>	The metadata file created by the <code>vxsnap create</code> command. Each snapshot set must have a unique name for the metadata file.
-b	Resynchronizes the volume in the background. A new snapshot cannot be made until the resynchronization is complete.
-f	Forces the operation. Make sure the volume is not in use before using this option.

<code>-r</code>	Recover even if original volume is not present. If this option is selected and the original volume is not present, the snapshot volume of the missing volume is changed from a read-only volume to a read-write volume.
<code>-a</code>	Dismount the databases before the restore operation and then mount the database after the restore operation.
<code>writer=<WriterName></code>	Unique ID of the VSS writer, for example, EnterpriseVault or the GUID for the writer.
<code>site=<SiteName></code>	Name of the Enterprise Vault site.
<code>VSG=<VSGName></code>	Name of the Enterprise Vault Store Group.
<code>VS=<VSName></code>	Name of the Enterprise Vault Store.
<code>component=<ComponentName></code>	Name of the Enterprise vault component. For example, Vault Store database, Fingerprint database, or Volume component, such as index, partitions, etc.
<code>restoreType={RECOVERY NO_RECOVERY}</code>	<p>Specifies the type of database recovery, either recovery or no recovery:</p> <p>With <code>RECOVERY</code> database and transaction log files are restored from the snapshot set. No transaction backup logs are applied. The database is left in an operational state.</p> <p>To back up logs so that you can restore the database using log replay, at least one Full backup must have been created earlier.</p> <p><code>NO_RECOVERY</code> restores from the specified snapshot set to the time of the snapshot. No logs are applied and the database is left in a loading state so that you can manually replay backup logs to a specific point in time.</p>

Example

```
vxsnap -x snapdata.xml restore RestoreType=RECOVERY  
writer=EnterpriseVault site=site1/vsg=vsg1/vs=vs1  
component="Directory DB"
```

The above command restores the vault store "vs1" and "Directory DB" from backup set using the metadata from snapdata.xml.

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