

VERITAS Storage Migrator™ 3.4

VERITAS Storage Migrator Remote™ 3.4

Installation Guide

UNIX

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VERITAS Software Corporation.
1600 Plymouth St.
Mountain View, CA 94043
Phone 650.335.8000
Fax 650.335.8050
<http://www.veritas.com>



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Introduction

This Installation Guide helps you install VERITAS Storage Migrator or VERITAS Storage Migrator Remote on a UNIX server system. It also contains some notes and cautions about these products. This document includes both initial installation procedures and upgrade installation procedures (from VSM 3.2.5. to VSM 3.4). Refer to the *VERITAS Storage Migrator for UNIX Release Notes* for a list of supported platforms, operating systems and file system levels.

This manual assumes that you have system administrator level knowledge in the following areas:

- ◆ UNIX operating system
- ◆ VERITAS NetBackup and its Media Manager application

Note If you are uncomfortable with any of these qualifications, contact your system administrator.

Due to the large degree of commonality between VERITAS Storage Migrator and VERITAS Storage Migrator Remote, this document uses the term *VSM* to refer to both products. Where differences occur, the full product name is used.

Installing VSM requires you to load the product binaries (executables) and possibly add VSM kernel modules to the system kernel. After installing VSM, you can also setup the example VSM configuration for verifying correct installation and trial use of VSM.



Notes and Cautions

This section explains things you need to know before you install or configure VSM.

Notes and Cautions for All Systems

VSM Client

Support for the VSM Client component of VERITAS Storage Migrator and VERITAS Storage Migrator Remote was dropped as of 3.2.

VERITAS Storage Migrator Licensing

New, with this release of VSM, is capacity-based licensing (`miglicense`). For new and existing sites, licensing is enforced when `migcopy` copies data using the following storage methods: optical (`op` and `ow`), tape (`ct`, `dt`, and `mt`), and VERITAS NetBackup (`nb`). Capacity includes active and obsolete granules, not any granules marked dead. See the `miglicense (1M)` man page for information on displaying both the current license capacity of VSM and the actual capacity currently in use at your site.

Caution You must have valid capacity license keys before you install VSM. The base capacity license key is included in the VSM 3.4 box. You can determine your license capacity by using the Storage Migrator Storage Space Test option in the VSM installation process (see “Install VSM Executables” on page 16). If you need to purchase additional license keys, call 1-800-342-0652 from the US and Canada, or +1 (650) 335-8555 outside of the US and Canada. Do not force the installation without the appropriate license keys.

When you install this product, you are prompted for a licensing key. Enter the capacity license keys for your site in the appropriate field. You will need a base capacity license key (this is in your VSM 3.4 box). You will also need additional capacity license keys, which you purchased for your installation. If you do not have a capacity license key, discontinue installing VSM. As your site grows, you will need to address licensing issues in the future. VSM automatically warns you when your site reaches 90% license capacity.

Using VSM-Java and Motif-based (`xhsmadm`) Configuration Interfaces

VERITAS strongly recommends that you use only one of the two interfaces, VSM-Java or `xhsmadm`, to configure your system. Do not use both interfaces simultaneously on your system; doing so can produce unpredictable results.

VERITAS NetBackup

Timeout on File Caches

If VSM is used in conjunction with VERITAS NetBackup, there is a timeout problem when VERITAS NetBackup tries to restore a file that has been migrated by VSM. 300 seconds is the default value of `CLIENT_READ_TIMEOUT` in the VERITAS NetBackup configuration file `/usr/opensv/netbackup/bp.conf`.

To correct this problem, reconfigure `CLIENT_READ_TIMEOUT` to be a larger number. A value of 600 seconds should be adequate in most cases.

VERITAS NetBackup Classes

When defining a VERITAS NetBackup class for migrating files with the `nb` method, set the class attribute for Storage Unit to a specific type. Do *not* use the default (any available).

If using VERITAS NetBackup to migrate files with the `nb` method, do not back up the managed file system to any VERITAS NetBackup class used by VSM for migrating files. Set the expiration date to infinite.

VERITAS NetBackup Restore

The restored slice size will be zero when you use VERITAS NetBackup to back up and restore migrated and purged files.

Dual Copies

If you are migrating dual copies and both are using the `nb` method, define more than one VERITAS NetBackup class and assign a different volume pool to each class. Then register each VERITAS NetBackup class to a different volume with a unique volume set number. Doing this prevents VSM from possibly migrating both copies of a file to the same physical media.

mignbscan Command

One of the configurable attributes for registering a VERITAS NetBackup class as an `nb` volume is `Size`, defined as the capacity in bytes of the VERITAS NetBackup system available for storing migrated files. A value of 0 is interpreted as unlimited storage capacity.

If the size of an `nb` volume is configured to be very large (or unlimited), running `mignbscan` is time consuming because every image is scanned within the VERITAS NetBackup class. VERITAS recommends that you define multiple VERITAS NetBackup classes and register each as a different volume with a finite size (of your own choosing).



Filename Restrictions

VSM will select and premigrate files with filenames containing any of these special characters:

* ? [] \ {

However, for DMAPI implementations of VSM these files cannot be migrated using the `nb` method. Other migration methods do not have these restrictions, nor do implementations of VSM on Solaris *ufs* file systems.

FlashBackup and Snapshot

Do not use the FlashBackup feature of VERITAS NetBackup (if available) and VERITAS VxFS Snapshot method to back up VSM-managed file systems.

NetBackup Media Manager

VERITAS Storage Migrator requires NetBackup Media Manager. Before registering tape or optical volumes in the VSM database, you must install, configure, and activate NetBackup Media Manager on the VSM server. For VERITAS Storage Migrator you must configure one or more VSM volume pools in NetBackup Media Manager. When registering tape and optical disc volumes, the volumes must be assigned to a VSM volume pool.

Note VERITAS Storage Migrator Remote does not use NetBackup Media Manager.

Unless, and until, the media registration process is completed, attempts to migrate files from a VSM managed file system will fail. Registration of media depends on the type of media being used. VSM adds media to its volume database (VOLDB) in the order the media is labeled. For more information see the *VERITAS Storage Migrator System Administrator's Guide*, chapter 3, "Register Media with VSM."

First Time Users

If you are installing VSM for the first time, we recommend that you setup VSM to manage a small file system first. This familiarizes you with the concepts and operation of VSM. When you finish testing, you must do additional cleanup before you configure your production (real) system. These steps are explained in "Testing Your Trial System (Optional)" on page 29.

Managing Subdirectories

You should consider the following if you want to manage a subdirectory as opposed to the entire file system:

- ◆ On *ufs* implementations, when the VSM daemon (*migd*) is not running, non-super users cannot access their files in the managed file system.
- ◆ VSM can report errors if migrated files are moved to or restored in the unmanaged part of the file system.
- ◆ Creating hard links to directories or files from the managed part of the file system to the unmanaged part can cause unexpected results.
- ◆ High and low watermarks are not based on the managed subdirectory, but on the total disk space for the file system. These parameters may not achieve the desired result.

Man Pages

All man pages are installed under the `/usr/opensv/man` directory:

- ◆ On Solaris and HP-UX, the man pages are in `/usr/opensv/man/share/man`
- ◆ On IRIX, the man pages are in `/usr/opensv/man/catman/local`

Add one of the man page paths (listed above) to your `MANPATH` environment variable to access the VSM man pages.

Software Patches

When installing software patches, do so in ascending numerical sequence. For a list of current patches for this product, visit our support web site at:

http://support.veritas.com/menu_ddProduct_VHSM.htm

Locking Delays

When a VSM process copies a file, the FHDB entry for that file is locked. Consequently, other VSM copy operations must wait until the first operation is done before locking the FHDB and continuing. For example, if you attempt to cache a file during a *migmove* operation (when that file is copied from one migration level to another), the file's FHDB entry is locked. This means *migmove* must be finished before *migcopy* can cache the file.

VSM-Java Interface

VSM-Java interface V3.4 must be used to manage VSM 3.4. Mismatched release versions of VSM-Java and VSM will not work together.



Even if the versions match, you may notice Java problems. These problems are documented in the *VERITAS NetBackup 3.4 Release Notes - UNIX* (see the “Java Problems Seen in NetBackup-Java” section).

Notes and Cautions for HP-UX Systems

Startup Script for HP-UX

For HP-UX systems, startup scripts can be used to start the VSM daemon and mount any *vxfs* file systems:

```
cp /usr/opensv/hsm/bin/goodies/hpuxrc.sh /sbin/init.d/hsm
ln -s /sbin/init.d/hsm /sbin/rc2.d/S680hsm
ln -s /sbin/init.d/hsm /sbin/rc1.d/K360hsm
```

This script is described in */usr/opensv/hsm/bin/goodies/README*.

Note If the sequence numbers, which are part of the symbolic links, are already used, you may use other numbers as necessary.

Note *hpuxrc.sh* starts the NetBackup Media Manager daemon, *ltid*, if it is installed on the system and you are using tape and or optical methods for VSM.

Dynamic Space Allocation

Inode space is allocated dynamically on *vxfs* file systems. After VSM migrates and purges large files, it is possible to create enough other files that the file manager will allocate additional inode space in the file system. In extreme situations, this additional inode space may not leave enough room in your file system for you to cache your migrated file.

Removing files from disk releases the space for the files, but not the allocated inode space.

The VSM configuration thresholds include the space used for the dynamically allocated inodes. If, for example, 55% of your file system is used for inode space, VSM will never be able to release any of this space.

Notes and Cautions for IRIX Systems

Startup Script for IRIX

The following suggested startup script will start the daemons and mount the *xfs* file systems:

```
cp /usr/opensv/hsm/bin/goodies/irixrc.sh /etc/init.d/hsm
ln -s /etc/init.d/hsm /etc/rc2.d/S78hsm
ln -s /etc/init.d/hsm /etc/rc0.d/K12hsm
```

This script is described in */usr/opensv/hsm/bin/goodies/README*.

Note If the sequence numbers, which are part of the symbolic links, are already used, you may use other numbers as necessary.

XFS and DMAPI

VSM supports the SGI XFS file system, and uses the DMAPI interface provided by XFS to manage a file system. Before installing VSM, you must install XFS and the software package *eo.e.sw.dmi*. After installing the *eo.e.sw.dmi* package, the *xfs* file system must be mounted with the *dmi* option. An example entry in the */etc/fstab* file is as follows:

```
/dev/dsk/xdv/xhsm1 /xhsm1 xfs dmi,rw,noauto 0 0
```

Known Problems and Limitations

- ◆ It is possible to remove a migrated file when the daemon is not running. Removing a migrated file leaves active entries for the removed files in the FHDB. To correct the FHDB, execute `migddbcheck -F -r hsmname` when *migd* is not running. You could remove a migrated file in two situations:
 - a. If the system is rebooted, and the managed file system is mounted before the daemon is running, you could remove a migrated file by doing an `rm file`.
 - b. If the managed file system is unmounted, the daemon is stopped, and the file system is remounted without restarting the daemon, you could remove a migrated file by doing an `rm file`.

VSM-Java Interface

The VSM-Java interface is not available on native SGI IRIX platforms. You can use a Windows NT workstation to manage an SGI IRIX server. To do this, you must first install VSM-Java on the Windows NT workstation. Or, if you do not have a Windows NT workstation, you can use *xhsmadm* to manage the SGI IRIX servers.



If you are also installing VSM on Solaris or HP-UX systems at your site, you can use either the Solaris or HP-UX system to manage VSM on SGI IRIX and other system types.

Notes and Cautions for Solaris Implementations (DMAPI Interface)

Startup Script for Solaris

For Solaris systems, this startup script will install the VSM attribute driver, start the daemon, and mount the *vxfs* file systems:

```
cp /usr/opensv/hsm/bin/goodies/S78hsmveritas /etc/rc2.d/S78hsmveritas
```

This script is described in */usr/opensv/hsm/bin/goodies/README*.

Note If the sequence number 78, which is part of the name of this startup script, is already used, you may use another number as necessary.

Note *S78hsmveritas* starts the NetBackup Media Manager daemon, *ltid*, if it is installed on the system and you are using tape and or optical methods for VSM.

Dynamic Space Allocation

Inode space is allocated dynamically on *vxfs* file systems. After VSM migrates and purges large files, it is possible to create enough other files that the file manager will allocate additional inode space in the file system. In extreme situations, this additional inode space may not leave enough room in your file system for you to cache your migrated file.

Removing files from disk releases the space for the files, but not the allocated inode space.

The VSM configuration thresholds include the space used for the dynamically allocated inodes. If, for example, 55% of your file system is used for inode space, VSM will never be able to release any of this space.

Notes and Cautions for Solaris Implementations (ufs)

Caution Do not use a VSM managed file system as a regular (*ufs*) file system on Solaris platforms. Changes will corrupt the file system in that configuration, and it will no longer provide proper access to migrated files. Therefore, an *hsm* file system must always be mounted and used as an *hsm* file system, except where otherwise indicated in supporting documentation.

Startup Script

If you want to automatically *fsck* and mount the VSM managed file systems at boot time, use the following procedure:

```
cp /usr/opensv/hsm/bin/goodies/S73HSM.mount /etc/rc2.d/S73HSM.mount
```

This script is described in `/usr/opensv/hsm/bin/goodies/README`.

The `setuphsm` command used later assumes this has been done, and changes `/etc/vfstab` appropriately.

Note If the sequence number 73, which is part of the name of this startup script, is already used, you may use another number as necessary.

Note `S73HSM.mount` starts the NetBackup Media Manager daemon, `ltid`, if it is installed on the system and you are using tape and or optical methods for VSM.

Quota

The *ufs* quota can not be turned on or off when a file system is mounted as an *hsm* file system.

Mount Option, noatime

In Solaris 8, the mount option `noatime` prevents `atime` changes on read access to files. This can cause VSM to migrate recently accessed files more aggressively than intended. Do not use this option with VSM.





Prerequisites for Installing VSM

The following prerequisite resources are needed for installing VERITAS Storage Migrator or VERITAS Storage Migrator Remote at release level 3.4 on a UNIX server system. Refer to the *VERITAS Storage Migrator Release Notes - UNIX* for a list of supported platforms, operating systems and file system levels.

Do the following before installing or upgrading VSM:

1. Verify that you have the VSM 3.4 installation CD-ROM. This CD-ROM also includes VSM-Java for the Windows NT platform, which you need when configuring VSM on SGI IRIX.
2. Verify that you have the VERITAS NetBackup DataCenter 3.4 and NetBackup Media Manager 3.4 installation CD-ROM.

Note NetBackup Media Manager is required for VERITAS Storage Migrator, but not for VERITAS Storage Migrator Remote.

3. Read “Notes and Cautions for All Systems” on page 2.
4. Verify that you have the root password to the server.
5. Verify that you have the base capacity license key and additional purchased capacity license keys for your installation.

Note You must have valid capacity license keys before you install VSM. The base capacity license key is included in the VSM 3.4 box. If you need to purchase additional license keys, call 1-800-342-0652 from the US and Canada, or +1 (650) 335-8555 outside of the US and Canada. Do not force the installation without the appropriate license keys.



6. Verify that you have adequate disk space in `/usr` partition for VSM. You will need about 100 MB of disk space.
7. Verify that you have about 40 MB of additional disk space in `/usr` partition (140 MB total available space) if NetBackup Media Manager is not yet installed, but will be used at your site.

Note NetBackup Media Manager is required for VERITAS Storage Migrator, but not for VERITAS Storage Migrator Remote.

8. Verify that you have about 70 KB of space in the root partition for kernel modules.
9. Optional: Verify that you have a file system available for testing. Testing is optional if you want to verify that VSM was successfully installed at your site.

Note If you are installing VSM for the first time, see “Initial Installation, 3.4” on page 13. For upgrade installation, see “Upgrade Installation, 3.2.5 to 3.4” on page 19.

10. Install the correct version of the file system you will manage with VSM:
 - a. For DMAPi implementations running on *Solaris*, obtain and install the VERITAS VxFS 3.3.3 executables separately before installing VSM 3.4.
 - b. For implementations running *HP-UX 10.20*, obtain and install OnlineJFS 3.1.
 - c. For implementations running *HP-UX 11.0*, obtain and install *one* of the following:
 - ◆ OnlineJFS 3.3.
 - ◆ VxFS 3.3.2.
 - d. For implementations running *SGI IRIX*, obtain and install the `eo.e.sw.dmi` kernel module from the SGI IRIX installation CD-ROM.

Note `eo.e.sw.dmi` is not installed by default when you use the standard IRIX install disk. Before you can use VSM, you must install this with SGI’s install procedures and reboot the system.

11. You are now ready to install VSM:
 - ◆ Go to “Initial Installation, 3.4” on page 13 to install VSM for the first time (initial installation). When you complete this step, finish to step 12 on page 13.
 - ◆ Go to “Upgrade Installation, 3.2.5 to 3.4” on page 19 to upgrade VSM from 3.2.5 to 3.4 (upgrade installation). When you complete this step, finish to step 12 on page 13.

Note The VSM installation usually takes about 30 minutes. Please note that installing VERITAS NetBackup and NetBackup Media Manager takes additional time.

12. You are now ready to configure VSM:

Go to “Initial Configuration with VSM-Java Interface, 3.4” on page 25 to configure VSM. This is only required if you are completing an initial install for VSM.

Initial Installation, 3.4

Follow the instructions in this section *only if you have never installed VSM before*. If you are upgrading VSM from 3.2.5 to 3.4, see “Upgrade Installation, 3.2.5 to 3.4” on page 19.

Verify that you have met all VSM installation prerequisites on “Prerequisites for Installing VSM” on page 11.

As a super-user, follow these steps to initially install VSM on the server system:

- 1.** Enable Large File Support (see “Enable Large File Support (Optional),” below). This process may be optional for your site.
- 2.** Install VERITAS NetBackup DataCenter 3.4 (see “Install VERITAS NetBackup DataCenter 3.4” on page 14).
- 3.** Install and configure NetBackup Media Manager (see “Install and Configure NetBackup Media Manager” on page 15). This process is required if you are installing VERITAS Storage Migrator.
- 4.** Install VSM executables (see “Install VSM Executables” on page 16). This process is required.
- 5.** Enable user permissions (see “Enable User Permissions” on page 18). This process may be optional for your site.
- 6.** Copy startup scripts (see “Copy Startup Scripts (optional)” on page 18). This process is required.
- 7.** Reboot the system if installing on HP-UX (see page “Reboot” on page 18). This process is required if installing VSM on HP-UX.
- 8.** You are now ready to configure VSM. See step 12 (in the previous section, “Prerequisites for Installing VSM”) for complete details on this process.

Enable Large File Support (Optional)

If you have a DMAPI implementation of VSM running on Solaris 2.6, Solaris 7, Solaris 8, or HP-UX, you can optionally configure the filesystem to support files that are two gigabytes (or larger). This procedure is not applicable for *ufs* file systems.

Caution Modifying a VxFS file system to support files larger than 2 gigabytes is irreversible.



- ◆ On Solaris system with VxFS, to enable large file support, execute this command for each managed *vxfs-type* file system:

```
/usr/lib/fs/vxfs/fsadm -F vxfs -o largefiles mount_point
```
- ◆ On HP-UX system with VxFS or OnLineJFS, use the following command:

```
/usr/sbin/fsadm -F vxfs -o largefiles mount_point
```
- ◆ No such action is required for SGI IRIX systems to enable large file support. SGI IRIX supports large files by default.

Install VERITAS NetBackup DataCenter 3.4

If you have not installed NetBackup DataCenter 3.4, you must complete the following steps now:

Note For complete details on this installation process, see the 3.4 *NetBackup DataCenter Installation Guide for UNIX*.

Note VSM does not support the VERITAS NetBackup BusinessServer.

- ◆ If this VSM server is also a NetBackup server, obtain and install VERITAS NetBackup DataCenter 3.4. If the VSM server is a VERITAS NetBackup client only, then push the appropriate VERITAS NetBackup 3.4 client software to this server.
The supported VERITAS NetBackup client types are as follows:
 - a. For Solaris 2.6, the VERITAS NetBackup client type is **Solaris** or **Solaris2.6**.
 - b. For Solaris 2.7, the VERITAS NetBackup client type is **Solaris** or **Solaris7**.
 - c. For Solaris 2.8, the VERITAS NetBackup client type is **Solaris** or **Solaris8**.
 - d. For SGI IRIX 6.5, the VERITAS NetBackup client type is **IRIX65**.
 - e. For HP-UX 10, the VERITAS NetBackup client type is **HP-UX10.20**.
 - f. For HP-UX 11, the VERITAS NetBackup client type is **HP-UX11.00**.

Install and Configure NetBackup Media Manager

Note This applies to VERITAS Storage Migrator only.

If you plan to use tape and optical disc methods `ct`, `dt`, `mt`, `op` or `ow`, install and configure the server for NetBackup Media Manager. Refer to the *VERITAS NetBackup DataCenter Installation Guide* and the *VERITAS NetBackup Media Manager Device Configuration Guide* for complete information.

Note Be sure to create a set of volumes in the HSM volume pool. If you are using optical volumes, be sure to format optical volumes under NetBackup Media Manager before you register those volumes in HSM. This is required for your trial and production (real) configurations if you are using the above methods.

Caution Unformatted optical volumes cannot be used by VSM.

To install and configure NetBackup Media Manager, do the following:

Note This procedure is not necessary if you are installing VERITAS Storage Migrator Remote.

1. Log in as root user on the UNIX server with a CD-ROM drive.
2. Insert the VERITAS NetBackup CD-ROM in the drive.
3. Change your working directory to the CD-ROM directory:

```
cd /cd_rom_directory*
```

On some platforms, it is necessary to mount the CD-ROM. For example,

```
mount /cd_rom_directory*
cd /cd_rom_directory*
```

*Where *cd-rom_directory* is the path to the directory for accessing the CD-ROM.

4. Execute the install script:

```
/install
```

Note *For Solaris only:* The default installation directory is `/opt`. You are asked to accept this or provide an alternate directory. If you chose an alternate directory, you must specify a directory *pathname that already exists*. By default, `/opt/openv/` is created and soft linked to `/usr/openv/` and `/opt/var/openv/` is created and soft linked



to `/usr/var/openv/`. The remaining sections of this document reference the linked directories `/usr/openv/hsm` and `/usr/var/openv/hsm` rather than the installed location.

5. Configure and test both NetBackup and NetBackup Media Manager by following the steps outlined in the NetBackup and NetBackup Media Manager documentation.

Install VSM Executables

Before you run the install script, you should know or do the following:

- ◆ Verify that the file systems you will manage with VSM do exist and are mounted. If these file systems do not exist, create these missing file systems using the vendor's file system `mkfs` command (or equivalent).
- ◆ Know your capacity license keys. You must enter the base capacity license key and any other required capacity license keys you purchased. The VSM license keys look something like this:
`1ABC-DE2F-GHIJ-K3LM-N4PQ` (this is not a real capacity license key).

Note You must have valid capacity license keys before you install VSM. The base capacity license key is included in the VSM 3.4 box. If you need to purchase additional license keys, call 1-800-342-0652 from the US and Canada, or +1 (650) 335-8555 outside of the US and Canada. Do not force the installation without the appropriate license keys.

To run the install script, do the following:

1. Log in as root user on the UNIX server that has the CD-ROM drive.
2. Insert the VERITAS Storage Migrator CD-ROM in the drive.
3. Change your working directory to the CD-ROM directory.
`cd /cd_rom_directory*`

On some platforms, it is necessary to mount the CD-ROM. For example,
`mount /cd_rom_directory*`
`cd /cd_rom_directory*`

*Where `cd-rom_directory` is the path to the directory for accessing the CD-ROM.

4. Enter the following command to execute the installation script:
`./install`

Note In previous releases of VSM, Solaris users used `pkgadd` to install VSM. You must now use `./install` to install VSM; `./install` automatically proceeds with the `pkgadd` command at the appropriate point in the install.

- ◆ On Solaris, the install script displays the following options first. Choose one of the following based on your configuration:
 - 1 Storage Migrator pkgadd SUNWhsmee
 - 2 Storage Migrator Storage Space Test
 - 0 To quit from these options

If you chose 2 from the above installation instructions, VSM performs a capacity usage test (Storage Migrator Storage Space Test) for your site.

If you chose 1 from the above installation instructions, and your site has sufficient capacity license keys, you will see the following:

1. Storage Migrator for Solaris ufs file system
2. Storage Migrator for VERITAS VxFS file system
3. Storage Migrator Remote for Solaris ufs file system
4. Storage Migrator Remote for VERITAS VxFS file system

Choose one of the above based on your configuration.

- ◆ On HP-UX and SGI IRIX, the install script requests the software packages you wish to install. Choose one of the following based on your configuration:
 1. Storage Migrator
 2. Storage Migrator Remote
 3. Storage Migrator Storage Space Test
- ◆ On HP-UX and Solaris, the script installs the VSM-Java interface executables. The VSM-Java interface is not installed on SGI IRIX systems. See “Installing VSM-Java” on page 26 for further details on how to use the VSM-Java interface to manage an SGI IRIX system. Or, you can use xhsmadm, which is installed on the SGI IRIX machine, to manage the SGI IRIX system. See “Configuration with the Motif-based interface, xhsmadm, 3.4” on page 37 for further details on xhsmadm.

Note You must have valid capacity license keys before you install VSM. The base capacity license key is included in the VSM 3.4 box. If you need to purchase additional license keys, call 1-800-342-0652 from the US and Canada, or +1 (650) 335-8555 elsewhere. Do not force the installation without the appropriate license keys.

`./install` determines if you have licensing sufficient for current usage at your site. `./install` will prompt you for license keys. If you are not prompted to use all of the license keys you purchased, this means your current usage does not require all licensing keys at this time. You can add unused capacity license keys at a future date with the `miglicense` command or VSM-Java interface.

VSM installs the executables in `/usr/opencv/hsm/bin` directory. Example configuration files are installed in `/usr/var/opencv/hsm/database` and `/usr/var/opencv/hsm/example/database`.



Enable User Permissions

Set user permissions, if desired, by executing the following commands:

- ◆ The `migrate` command allows users to force migrate specific files. Enter this command to give users permission to execute `migrate`:

```
chmod 4511 /usr/opensv/hsm/bin/cmd/migrate
```

- ◆ The `migpurge` command allows users to force purge specific files. Enter this command to give users permission to execute `migpurge`:

```
chmod 4511 /usr/opensv/hsm/bin/cmd/migpurge
```

On Solaris platforms the administrator must also enter the following command to allow users to purge their own files:

```
chmod 4511 /usr/opensv/hsm/bin/admincmd/migmkspace
```

- ◆ The `migtie` command allows users to cache groups of related files together. Enter this command to give users permission to execute `migtie`:

```
chmod 4511 /usr/opensv/hsm/bin/migtie
```

- ◆ The `miggroup` command allows users to premigrate files in a grouped directory together. Enter this command to give users permission to execute `miggroup`:

```
chmod 4511 /usr/opensv/hsm/bin/miggroup
```

- ◆ Set user permissions for `migtarhelp` and `migsetdb` if you want to allow a nonroot user to restore a migrated and purged file using VERITAS NetBackup:

```
chmod 4511 /usr/opensv/hsm/bin/admincmd/migtarhelp
```

```
chmod 4511 /usr/opensv/hsm/bin/migsetdb
```

Copy Startup Scripts (optional)

If you want to use the startup scripts listed earlier in this manual:

- ◆ To copy the startup scripts for HP-UX, see “Startup Script for HP-UX” on page 6.
- ◆ To copy the startup scripts for SGI IRIX, see “Startup Script for IRIX” on page 7.
- ◆ To copy the startup scripts for Solaris, see “Startup Script” on page 9.

Note The startup scripts were updated in the 3.4 release of VSM.

Reboot

If installing on HP-UX, you must reboot the server. For all other operating systems, a reboot is not required.

Upgrade Installation, 3.2.5 to 3.4

Follow the instructions in this section if you already have VSM 3.2.5 installed. If you are installing VSM for the first time on this system, see “Initial Installation, 3.4” on page 13.

Verify that you have met all VSM installation prerequisites. If you are uncertain of this, see “Prerequisites for Installing VSM” on page 11 for complete information.

As a super-user, follow these steps to install VSM on the server system:

1. Prepare to Upgrade (see “Prepare to Upgrade,” below). This process is required.
2. Upgrade Solaris Operating Systems (see “Upgrade Solaris Operating Systems” on page 20). This process is required if you are upgrading a Solaris server.

Note Solaris 2.5.1 is no longer supported in 3.4, therefore you must convert to a later Solaris release.

3. Changing file systems from ufs-type to vxfs-type (see “Converting from ufs-type to vxfs-type File Systems” on page 33). This process may be optional for your site.
4. Upgrade NetBackup Media Manager to 3.4 (see “Upgrade to NetBackup Media Manager 3.4” on page 20). This process applies only to VERITAS Storage Migrator.
5. Upgrade VERITAS NetBackup 3.2 to VERITAS NetBackup DataCenter 3.4 (see the *NetBackup DataCenter Installation Guide for UNIX 3.4*). This process is required.
6. Install VSM executables (see “Install VSM Executables” on page 21). This process is required.
7. Enable user permissions (see “Enable User Permissions” on page 23). This process may be optional for your site.
8. Reboot the system if installing on HP-UX (see “Reboot” on page 24). This process is required if installing VSM on HP-UX.
9. You are now ready to configure VSM. See step 12 (in “Prerequisites for Installing VSM” on page 11) for complete details on this process.

Prepare to Upgrade

1. Prevent users from forcing new migrations by renaming the migrate command:


```
mv /usr/opensv/hsm/bin/migrate /usr/opensv/hsm/bin/migrate.old
```
2. Prevent cron jobs from running any VSM commands automatically.
3. Run migddbcheck to make sure the FHDB is correct.
Repeat this step for each VSM managed file system.



4. Before doing a backup (see step 5), make sure that all migrated files are copied. If not, use `migbdcheck` and `migr -R` to copy your files. Be sure to exclude the `.PAIN` file and the premigration directory on ufs file systems. Repeat this step for each VSM managed file system.
5. Backup the managed file system using VERITAS NetBackup. This is a precautionary step. Repeat this step for each VSM managed file system.
6. Stop the `migrd` daemon with the UNIX `kill` command.
7. Back up all VSM databases and the global database `/usr/var/openv/hsm`.
8. Stop the `migd` and `migvold` daemon with the `stopmigd` command.
9. Remove the old VSM executables (but *not* the databases):

```
rm -r /usr/openv/hsm/bin
```

Note If desired, you can copy the previous release executables to another directory. The `/usr/openv/hsm` directory must remain intact, however, so the installation process recognizes this as an upgrade installation.

Note You can convert your file system from ufs-type to vxfs-type. If you convert your file system from ufs-type to vxfs-type, you must do so *before* you install any new VSM software (see “To Convert from ufs-type to vxfs-type” on page 33 for further information).

Upgrade Solaris Operating Systems

- ◆ You must upgrade Solaris 2.5.1 to Solaris 2.6, 7, or 8 (required).
- ◆ You can upgrade from Solaris 7 to Solaris 8 (optional). To do this, follow Sun’s operating system instructions.

Upgrade to NetBackup Media Manager 3.4

Note This applies to VERITAS Storage Migrator only.

If you plan to use tape and optical disc methods `ct`, `dt`, `mt`, `op`, or `ow`, install and configure NetBackup Media Manager on this server. Refer to the *VERITAS NetBackup DataCenter Installation Guide* and the *VERITAS NetBackup Media Manager Device Configuration Guide* for complete information. Be sure to create a set of volumes in the HSM volume pool. If you are using optical volumes, be sure to format these volumes under NetBackup Media Manager before registering optical volumes in HSM.

Caution Unformatted optical volumes cannot be used by VSM.

To install and configure NetBackup Media Manager, do the following:

1. This procedure is not necessary if you are installing VERITAS Storage Migrator Remote. Log in as root user on the UNIX server that has the CD-ROM.
2. Insert the VERITAS NetBackup CD-ROM in the drive.
3. Change your working directory to the CD-ROM directory:

```
cd /cd_rom_directory*
```

On some platforms, it is necessary to mount the CD-ROM. For example:

```
mount /cd_rom_directory*  
cd /cd_rom_directory*
```

*Where *cd-rom_directory* is the path to the directory for accessing the CD-ROM.

4. Execute the install script:

```
./install
```
5. Test both NetBackup and NetBackup Media Manager by following the steps outlined in the NetBackup and NetBackup Media Manager documentation.

Install VSM Executables

Before you run the install script, you should know the following:

- ◆ Know your capacity license keys. You must enter the base capacity license key and any other required capacity license keys you purchased. The VSM license keys look something like this:
1ABC-DE2F-GHIJ-K3LM-N4PQ (this is not a real capacity license key)

Note You must have valid capacity license keys before you install VSM. The base capacity license key is included in the VSM 3.4 box. You can determine your license capacity by using the Storage Migrator Storage Space Test option in the VSM installation process (see “Install VSM Executables” on page 16). If you need to purchase additional license keys, call 1-800-342-0652 from the US and Canada, or +1 (650) 335-8555 outside of the US and Canada. Do not force the installation without the appropriate license keys.



To run the install script, do the following:

1. Log in as root user on the UNIX server that has the CD-ROM drive.
2. Insert the VERITAS Storage Migrator CD-ROM in the drive.
3. Change your working directory to the CD-ROM directory.

```
cd /cd_rom_directory*
```

On some platforms, it is necessary to mount the CD-ROM. For example,

```
mount /cd_rom_directory*  
cd /cd_rom_directory*
```

*Where *cd_rom_directory* is the path to the directory for accessing the CD-ROM.

4. Enter the following command to execute the installation script:

```
./install
```

Note In previous releases of VSM, Solaris users used `pkgadd` to install VSM. You must now use `./install` to install VSM; `./install` automatically proceeds with the `pkgadd` command at the appropriate point in the install.

- ◆ On Solaris, the install script displays the following options first. Choose one of the following based on your configuration:
 - 1 Storage Migrator `pkgadd SUNWhsmee`
 - 2 Storage Migrator Storage Space Test
 - 0 To quit from these options

If you chose 2 from the above, VSM performs a capacity usage test (Storage Migrator Storage Space Test) for your site

If you chose 1 from the above, and your site has sufficient capacity license keys, you will see the following:

1. Storage Migrator for Solaris ufs file system
2. Storage Migrator for VERITAS VxFS file system
3. Storage Migrator Remote for Solaris ufs file system
4. Storage Migrator Remote for VERITAS VxFS file system

Choose one of the above based on your configuration.

- ◆ On HP-UX and SGI IRIX, the install script requests the software packages you wish to install. Choose one of the following based on your configuration:
 1. Storage Migrator
 2. Storage Migrator Remote
 3. Storage Migrator Storage Space Test

- ◆ On HP-UX and Solaris, the script installs the VSM-Java interface executables. The VSM-Java interface is not installed on SGI IRIX systems. See “Installing VSM-Java” on page 26 for further details on how to use the VSM-Java interface to manage an SGI IRIX system. Or, you can use xhsmadm, which is installed on the SGI IRIX machine, to manage the SGI IRIX system. See “Configuration with the Motif-based interface, xhsmadm, 3.4” on page 37 for further details on xhsmadm.

Caution You must have valid capacity license keys before you install VSM. The base capacity license key is included in the VSM 3.4 box. If you need to purchase additional license keys, call 1-800-342-0652 from the US and Canada, or +1 (650) 335-8555 outside of the US and Canada. Do not force the installation without the appropriate license keys.

`./install` determines if you have licensing sufficient for current usage at your site. `./install` will prompt you for license keys. If you are not prompted to use all of the license keys you purchased, this means your current usage does not require all licensing keys at this time. You can add unused capacity license keys at a future date with the `miglicense` command or VSM-Java interface.

VSM installs the executables in `/usr/opensv/hsm/bin` directory. Example configuration files are installed in `/usr/var/opensv/hsm/database` and `/usr/var/opensv/hsm/example/database`.

Enable User Permissions

Set user permissions, if desired, by executing the following commands:

- ◆ The `migrate` command allows users to force migrate specific files. Enter this command to give users permission to execute `migrate`:

```
chmod 4511 /usr/opensv/hsm/bin/cmd/migrate
```

- ◆ The `migpurge` command allows users to force purge specific files. Enter this command to give users permission to execute `migpurge`:

```
chmod 4511 /usr/opensv/hsm/bin/cmd/migpurge
```

On Solaris platforms the administrator must also enter the following command to allow users to purge their own files:

```
chmod 4511 /usr/opensv/hsm/bin/admincmd/migmkspace
```

- ◆ The `migtie` command allows users to cache groups of related files together. Enter this command to give users permission to execute `migtie`:

```
chmod 4511 /usr/opensv/hsm/bin/migtie
```

- ◆ The `migroup` command allows users to premigrate files in a grouped directory together. Enter this command to give users permission to execute `migroup`:



```
chmod 4511 /usr/opensv/hsm/bin/miggroup
```

- ◆ Set user permissions for migtarhelp and migsetdb if you want to allow a nonroot user to restore a migrated and purged file using VERITAS NetBackup:

```
chmod 4511 /usr/opensv/hsm/bin/admincmd/migtarhelp
```

```
chmod 4511 /usr/opensv/hsm/bin/migsetdb
```

Copy Startup Scripts (optional)

If you want to use the startup scripts listed earlier in this manual:

- ◆ To copy the startup scripts for HP-UX, see “Startup Script for HP-UX” on page 6.
- ◆ To copy the startup scripts for SGI IRIX, see “Startup Script for IRIX” on page 7.
- ◆ To copy the startup scripts for Solaris, see “Startup Script” on page 9.

Note The startup scripts were updated in the 3.4 release of VSM.

Reboot

If installing on HP-UX, you must reboot the server. For all other operating systems, a reboot is not required.

Configuration with VSM-Java

3

If you just installed VSM for the first time, follow the steps in this chapter before you can use VSM. If this is an upgrade installation, you do not need to configure VSM. The configuration steps in this chapter use VSM-Java. If you use the Motif-based interface (xhsmadm) to configure VSM, see “Configuration with the Motif-based interface, xhsmadm, 3.4” on page 37.

Note VERITAS strongly recommends that you use only VSM-Java or xhsmadm to change the configuration of your system. Do not use both interfaces simultaneously on your system; doing so can produce unpredictable results.

Note *NetBackup Media Manager Configuration:* To make use of unassigned tape and optical volumes in the scratch pool on NetBackup Media Manager, include the following statement in the NetBackup Media Manager configuration file,
/usr/openv/volmgr/vm.conf.
SCRATCH_POOL = *scratch_pool_name*
*Where *scratch_pool_name* is the pool name for all volumes currently unassigned in the NetBackup Media Manager scratch pool.

Initial Configuration with VSM-Java Interface, 3.4

As a super-user, follow these steps to configure VSM, for both test (optional) and production systems:

1. Make sure that you have VSM installed before you start your configuration (see “Prerequisites for Installing VSM” on page 11). This process is required.
2. Setup your trial system configuration (see “Trial System Configuration (Optional)” on page 27). This process may be optional for your site.
3. Test your trial VSM installation (see “Testing Your Trial System (Optional)” on page 29). This process may be optional for your site.
4. Setup your production (real) system configuration (see “Configuring Your Production System with VSM-Java” on page 31). This process is required.



About VSM-Java

This section explains how to install and launch VSM-Java. You will need to use VSM-Java for both your test and production configuration. For complete details on using VSM-Java, refer to the *VERITAS Storage Migrator for UNIX System Administrator's Guide*.

Note See “Configuration with the Motif-based interface, xhsmadm, 3.4” on page 37 for complete details on configuring VSM with the Motif-based (xhsmadm).

The VSM-Java interface is not available on native SGI IRIX platforms. You can use a Windows NT workstation to manage SGI IRIX server. To do this, you must first install VSM-Java on that Windows NT workstation. Or, if you do not have a Windows NT workstation, you can use xhsmadm to manage the SGI IRIX servers.

If you are also installing VSM on Solaris or HP-UX systems at your site, you can use either the Solaris or HP-UX system to manage VSM on SGI IRIX and other system types.

Installing VSM-Java

To use the VSM-Java interface, it should be installed on a Java-capable machine. If you installed VSM on a Solaris or HP-UX server, VSM-Java is installed on that machine. VSM-Java is available for use with the local (or remote) display console. A Windows NT workstation can also be used as a remote display console for Solaris or HP-UX servers. If you use a Windows NT workstation as a remote display console, you must first install VSM-Java for Windows NT on that workstation.

If you installed VSM on SGI IRIX, the VSM-Java interface is not installed on that machine. To use VSM-Java as a remote display console to manage an SGI IRIX servers, you must find a Windows 2000 or Windows NT workstation and install VSM-Java on that workstation.

VSM-Java for Windows NT is available on the VSM 3.4 installation CD-ROM. To install VSM-Java for Windows NT, insert the installation CD-ROM in the Windows NT workstation CD drive, click Install, and follow the screen prompts.

Note For more information on how to configure VSM with VSM-Java interface, refer to the *VERITAS Storage Migrator for UNIX System Administrator's Guide*.

Launching VSM-Java

Start migrd on the VSM server with the following command:
`/usr/opensv/hsm/bin/admincmd/migrd`

Note You must start migrd on all VSM systems you will manage with VSM-Java.

To launch VSM-Java for Windows NT, do the following:

- ◆ Select Unix Administration from the VERITAS Storage Migrator menu.
Start > Programs > VERITAS Storage Migrator > Unix Administration
Doing this will launch VSM-Java. For further details on how to use VSM-Java for Windows NT, see “Trial System Configuration (Optional)” on page 27 or “Configuring Your Production System with VSM-Java” on page 31.

To launch VSM-Java on Solaris or HP-UX, do the following:

- ◆ If using UNIX, set your *DISPLAY* variable.
- ◆ Use the *migsa* command to launch VSM-Java:
`/usr/opensv/java/migsa &`

Note For further details on how to use VSM-Java, see “Trial System Configuration (Optional)” on page 27 or “Configuring Your Production System with VSM-Java” on page 31.

Trial System Configuration (Optional)

Before starting VSM, you can set up trial VSM configuration files for testing.

For trial configuration with VSM-Java, complete the following steps:

1. Make sure the file system is mounted correctly for your operating system (as described below). The examples below require correct *fstab* entries:
 - ◆ If you are running *kernel-based Solaris (ufs)*, the managed file systems must be mounted as *hsm* file systems. An example *mount* command is as follows:

```
mount -F hsm /dev/rdsk/c0t0d0s6 /test1
```

- ◆ If you are running *DMAPI (nonkernel-based) Solaris (vxfs)*, the managed file systems must be mounted as *vxfs* file systems. An example *mount* command is as follows:

```
mount -F vxfs -o largefiles /dev/rdsk/c0t0d0s6 /test1
```

- ◆ If you are running *DMAPI HP-UX*, the managed file systems must be mounted as *vxfs* file systems. An example *mount* command is as follows:

```
mount -F vxfs -o largefiles /dev/vg00/lvol9 /hsm9
```



- ◆ If you are running *SGI IRIX*, the managed file systems must be mounted as xfs file systems, with the dmi option enabled. Examples of the `/etc/fstab` entry and mount command are below:

```
/dev/dsk/dks0dis2 /test xfs rw,dmi 0 0
mount -F xfs -o dmi /dev/dsk/dks3d3s4 /hsm3
```

2. During configuration on implementations for Solaris *ufs* file systems, VSM will unmount and mount the managed file system. Selected file systems, therefore, must be mounted, but not in use at this time. For this reason, you cannot manage `/` (the root file system), `/usr`, `/swap`, and other file systems that are required at all times.

Note Before using VSM commands make sure the path `/usr/openv/hsm/bin` is included in your search path. You can change the root user's login script to include the path to VSM and NetBackup Media Manager executables. The NetBackup Media Manager executables are in `/usr/openv/volmgr/bin` directory.

Note You must register at least one volume for the migration method you chose for trial. If you are using VERITAS Storage Migrator with methods `ct`, `dt`, `mt`, `op`, or `ow`, make sure at least one volume is registered to HSM or in a volume pool VSM is using. Also make sure that the NetBackup Media Manager daemons are active at this time.

3. Start the VSM daemon `migrd` by entering the following:
`/usr/openv/hsm/bin/admincmd/migrd`
4. Start the NetBackup Media Manager daemon, `ltid`, if you are migrating to tape or optical media. The system is now ready for migration.
5. If using UNIX, set your *DISPLAY* variable.
6. If using UNIX, start the VSM-Java interface with the `migsa` command:
`/usr/openv/java/migsa &`
7. Login to the server that you will configure for a trial VSM configuration.
8. Start the VSM daemons with VSM-Java by selecting Start Daemons from the Server... submenu in the ACTIONS menu.
9. Select a server from the left pane of the Storage Migrator main dialog.
10. Create a new hierarchy in VSM-Java. You can do this through a configuration wizard or by selecting New Hierarchy... from the Edit menu.
11. Name the new hierarchy **hsm1**. Deselect dual copies to test with a single copy. Click Next when done.

Note Always use dual copies in production configurations.

12. Select Primary Copy. Click Next when done.
13. Select the appropriate storage method for your installation. Click Next when done.

Note Be sure to create a set of volumes in the HSM volume pool. If you are using optical volumes, be sure to format optical volumes under NetBackup Media Manager before you register those volumes in HSM. This is required if you are using the `ct`, `dt`, `mt`, `op`, or `ow` methods.

14. Select the default stripe properties for your installation. Click Finish when done. You have now completed the trial configuration.
15. Select a file system that you want to manage (a test file system) from the left pane of the Storage Migrator main dialog.
16. Add the test file system to the new hierarchy you created in VSM-Java. You can do this through a configuration wizard or by selecting New HSM Management... from the Edit menu.
17. Select the hierarchy (created above) to manage this file system. Click OK. When you complete this step, you are done configuring your test system.
18. Proceed to “Testing Your Trial System (Optional),” below, to test your trial system.

Testing Your Trial System (Optional)

Once you complete your trial configuration (“Trial System Configuration (Optional)” on page 27), your trial system is ready for testing.

Caution Testing requires you to create a trial configuration. We recommend that you do the following *before* you create a production (real) configuration:

1. Remove the test files and directories.
2. Re-initialize the file system.
3. Recycle test volumes using the `migreecycle` command.
4. Remove the hierarchy from the VSM configuration with VSM-Java. This is required if you will use a different production configuration than your trial configuration.



To test that your system is installed correctly, and to get familiar with VSM operation, follow these steps.

The following steps allow you to migrate and cache a file:

```
cd managed-fs                /*Change to the managed file system*/  
mkdir test                   /*Create a temporary test directory*/  
cd test  
cp /usr/var/openv/hsm/example/database/migconf testfile  
                                /*Create a test file in test directory*/
```

Note Make sure that `testfile` is larger than the configured slice when you complete the above command.

```
migrate testfile             /*Premigrate the file*/  
migrc -R hsm1                /* Push the file to secondary storage */  
    where: hsm1 = The hierarchy name used in the trial configuration file.
```

Note Do not continue until you see `migrecover.sh [pid] : Finished` message in the VSM log.

```
migloc testfile              /* See Migrated status, dk & secondary storage  
                                method used (ct, dt, mt, op, ad, etc.)*/  
migpurge testfile            /* Purge the premigrated file */  
migloc testfile              /* See Migrated status & no dk method*/  
cat testfile                 /* Cache the file back to disk */  
migloc testfile              /*See cached status */
```

Note If you get any error messages following this procedure, examine the VSM error log files to determine the exact cause.

Caution You *must* clean up your trial system before continuing with this process:

1. Remove the test files and directories.
2. Re-initialize the file system.
3. Recycle test volumes using the `migrecycle` command.
4. Remove the hierarchy from the VSM configuration with VSM-Java. This is required if you will use a different production configuration than your trial configuration.

Configuring Your Production System with VSM-Java

Before starting VSM, you must set up the VSM configuration files. If you used your production configuration as your trial configuration, you can skip the following procedure.

Note You should follow the steps below *only* if you are configuring VSM for the first time on this server.

Note You must register at least one volume for the migration method you chose for production. If you are using VERITAS Storage Migrator with methods `ct`, `dt`, `mt`, `op`, or `ow`, make sure at least one volume is registered to VSM or in a volume pool VSM is using. Also make sure that the NetBackup Media Manager daemons are active.

For production (real) configuration of VSM with VSM-Java, complete the following steps:

1. Make sure the file system is mounted correctly for your operating system (as described below). The `setuphsm` command will leave the file system correctly mounted if it encountered no errors:
 - ◆ If you are running *kernel-based Solaris (ufs)*, the managed file systems must be mounted as hsm file systems. An example mount command is as follows:
`mount -F hsm /dev/dsk/c0t0d0s6 /test1.`
 - ◆ If you are running *DMAPI (nonkernel-based) Solaris (vxfs)*, the managed file systems must be mounted as vxfs file systems. An example mount command is as follows:
`mount -F vxfs -o largefiles /dev/dsk/c0t0d0s6 /test1`
 - ◆ If you are running *DMAPI HP-UX*, the managed file systems must be mounted as vxfs file systems. An example mount command is as follows:
`mount -F vxfs -o largefiles /dev/vg00/lvol9 /hsm9`
 - ◆ If you are running *SGI IRIX*, the managed file systems must be mounted as xfs file systems, with the `dmi` option enabled. Examples of the `/etc/fstab` entry and mount command are below:
`/dev/dsk/dks0dis2 /test xfs rw,dmi 0 0`
`mount -F xfs -o dmi /dev/dsk/dks3d3s4 /hsm3`



- ◆ During configuration on implementations for Solaris *ufs* file systems, VSM will unmount and mount the managed file system. Selected file systems, therefore, must be mounted, but not in use at this time. For this reason, you cannot manage / (the root file system), /usr, /swap, and other file systems that are required at all times.

Note Before using VSM commands make sure the path /usr/opensv/hsm/bin is included in your search path. You can change the root user's login script to include the path to VSM and NetBackup Media Manager executables. The NetBackup Media Manager executables are in /usr/opensv/volmgr/bin directory.

Note If you are using VERITAS Storage Migrator with methods ct, dt, mt, op, or ow, make sure at least one volume is registered to VSM or in a volume pool VSM is using. Also make sure that the NetBackup Media Manager daemons are active at this time.

2. Start the VSM daemons (migd and migvold) with the startmigd command.
 3. Start the VSM daemon (migrd) with the migrd command.
 4. Start the NetBackup Media Manager daemon, ltid, if you are migrating to tape or optical media. The system is now ready for migration.
 5. If using UNIX, set your *DISPLAY* variable.
 6. If using UNIX, start the VSM-Java interface with the migsd command.
 7. Login to the server that you will use for a trial VSM configuration.
 8. Complete the configuration process for your site. You can do this with a configuration wizard or through VSM-Java. For an example configuration, see "Trial System Configuration (Optional)" on page 27.
- Once you have VSM configured, you are ready to use VSM.

Upgrade Configuration with VSM-Java Interface, 3.4

Once you have VSM installed, upgrading from version 3.2.5 to version 3.4 does not require you to reconfigure your system.

Converting from ufs-type to vxfs-type File Systems

A

This appendix describes how to convert from an existing ufs-type VSM managed file system to a vxfs-type VSM managed file system. Do this *before* installing any new VSM software.

Follow this procedure when you are changing from a kernel-based implementation of VSM to a non-kernel-based implementation of VSM.

The steps in this chapter use the Motif-based interface, `xhsmadm`. You can use VSM-Java to perform the same functions.

Caution VERITAS strongly recommends that you use only VSM-Java or `xhsmadm` to change the configuration of your system. Do not use both interfaces simultaneously on your system; doing so can produce unpredictable results.

To Convert from ufs-type to vxfs-type

To convert from ufs-type to vxfs-type, do the following:

1. Make sure all copies of migrated files have been made. Run `migrcc -R` to finish making copies. Repeat this step for each VSM managed file system.
2. Purge all files in premigration by running `mignospace -i hsmname`; or from the Motif-based interface, `xhsmadm`, pull down the Migration menu and choose Remove or migrate (mignospace). Repeat this step for each VSM managed file system.
3. Run `migddbcheck` to make sure the FHDB is correct, and correct it if necessary. Repeat this step for each VSM managed file system.
4. Backup the managed file system by using VERITAS NetBackup. Make sure that you exclude the `.PAIN` file in the backup. Repeat this step for each VSM managed file system.
5. Stop the `migrd` daemon with the UNIX `kill` command.
6. Stop all VSM activity by setting the state attribute of each VSM to 0 (Inactive) and executing `stopmigd`.



-
7. Back up all VSM executables with `tar` or VERITAS NetBackup (optional). Repeat this step for all managed file systems.

```
/bin/tar -cvpf backup_file /usr/opensv/hsm
```

8. Back up all VSM databases with `tar` or VERITAS NetBackup (optional). Repeat this step for all managed file systems.

```
/bin/tar -cvpf backup_file dwpath
```

9. Unmount all managed file systems.
10. Run `install.hsm -d` to deinstall the current VSM kernel mods. If you were using an `rc2.d` script like `S73HSM.mount`, remove it.
11. Update `/etc/vfstab` by removing the managed `ufs` file system and adding the `vxfs` file system to be managed. Repeat this step for each VSM managed file system.
12. Exit from the Motif-based interface, `xhsmadm`.
13. Remove the old VSM executables. You must *not* remove any of the VSM databases.

```
rm -rf /usr/opensv/hsm
```

14. Install the new VSM.
15. Reactivate the Motif-based interface, `xhsmadm`, and set the state attribute of each VSM to 1 (Active).

Note Mount the `vxfs` VSM managed file system at the same mount point as the `ufs` VSM managed file system. If you want them to be different, you must run an FHDB conversion script `change_path.sh` mentioned in step 21.

16. Mount the `vxfs` file system at the configured path. Repeat this step for each VSM managed file system.
17. Run `setuphsm`. Repeat this step for each VSM managed file system.
18. Run `stopmigd` and then run `startmigd`.
19. Restore all the backed up file systems using VERITAS NetBackup. Repeat this step for each VSM managed file system.
20. Run `stopmigd`.
21. If you have mounted the `vxfs` file system on a different path than the `ufs` file system run the following:

```
/usr/opensv/hsm/bin/admincmd/change_path.sh  
-s path_current_fhdb -o old_mount_point -n new_mount_point  
-d path_new_fhdb
```

Copy the new FHDB created by `change_path.sh` on top of the old FHDB. Repeat this step for each VSM managed file system.

-
22. Run `migdbcheck` to make sure the FHDB is correct, and correct it if necessary. If the file `/tmp/migdbcheck-orphan.hsmname.pid` was created by `migdbcheck`, then `ufs` cached unmodified files were restored as regular files. These files can be converted back to cached unmodified files by running this command:

```
/usr/opensv/hsm/bin/admincmd/convert_to_cached.sh  
-f path_to_migdbcheck-orphan_list hsmname
```

Repeat this step for each VSM managed file system.

Note If you do not convert the `path_to_migdbcheck-orphan_list`, new copies of these files will be made the next time they are migrated.

23. Run `startmigd`.

24. Run `/usr/opensv/hsm/bin/migalter -I mount_point_of_vxfs_file_system`.
Repeat this step for each VSM managed file system.

25. Copy the supplied startup script. This script will install the VSM attribute driver, start the daemon, and mount the `vxfs` file system:

```
cp /usr/opensv/hsm/bin/goodies/S78hsmveritas  
/etc/rc2.d/S78hsmveritas
```

Note If the sequence number 78, which is part of the name of this startup script, is already used, you can use another number as necessary.

After you run the above script, the non-kernel-based implementation of VSM should now be up and running.

Notes and Cautions

- ◆ Slice values do not carry forward through the conversion process.
- ◆ If the mount path has changed and you later scan volumes to reconstruct the FHDB, the paths in the reconstructed FHDB will be wrong.
- ◆ If `convert_to_cached.sh` was not run in step 22 (in “To Convert from `ufs`-type to `vxfs`-type” on page 33), then cached unmodified files look the same as cached modified files. If any of these files existed, the FHDB is now incorrect and must be corrected.

Run `migdbcheck -F hsmname` to see if there are FHDB problems. If there are any problems, `migdbcheck` issues a message similar to this:

```
-- ERROR: 1 FHDB entries with no file with a matching handle were found.
```

To correct the FHDB, run `migdbcheck -F -r hsmname` and mark the entries inactive when asked to do so by `migdbcheck`.





Alternate Configuration Interface

B

Configuration with the Motif-based interface, `xhsmadm`, 3.4

This section describes how to configure VSM with the Motif-based interface, `xhsmadm`. All installation steps should be completed before configuring VSM with `xhsmadm`. Before you attempt an installation, complete the VSM install described on “Initial Installation, 3.4” on page 13.

Note If configuring VSM for the first time, VERITAS recommends that you use VSM-Java (Java-based interface), not `xhsmadm`. See “Initial Configuration with VSM-Java Interface, 3.4” on page 25 for complete details.

Configuration Prerequisites

Complete the following steps if you want to prepare the system for VSM configuration with `xhsmadm`:

1. Make sure the file system is mounted correctly for your operating system (as described below). The `setuphsm` command will leave the file system correctly mounted if it encountered no errors:
 - ◆ If you are running *kernel-based Solaris (ufs)*, the managed file systems must be mounted as hsm file systems.
 - ◆ If you are running *DMAPI Solaris* or *DMAPI HP*, the managed file systems must be mounted as vxfs file systems.
 - ◆ If you are running *SGI IRIX*, the managed file systems must be mounted as xfs file systems, with the `dmi` option enabled.
2. Start the VSM daemons (`migd` and `migvold`), if they are not already running, with `xhsmadm` or `startmigd`.
3. Start the NetBackup Media Manager daemon, `ltid`, if you are migrating to tape or optical media. The system is now ready for migration.

Note You can use configuration process (see “Configuring Your System with `xhsmadm`” on page 38) for both trial and production systems.



Configuring Your System with xhsmadm

This section describes how to configure VSM with the Motif-based interface, xhsmadm. All installation steps should be completed before configuring VSM with xhsmadm. If you have not yet installed VSM, see “Initial Installation, 3.4” on page 13 for complete information.

Note If configuring a VSM with VSM-Java (Java-based interface), see “Initial Configuration with VSM-Java Interface, 3.4” on page 25.

Caution If an earlier release of VSM has already been installed, do not use this initial installation procedure.

Complete the followings steps to configure each VSM managed file system with xhsmadm:

Note Make sure that you have all of the installation prerequisites. See “Prerequisites for Installing VSM” on page 11. This includes any required patches.

1. Before starting VSM, you must setup the VSM configuration files after you install VSM. Follow these steps only if you are configuring VSM for the first time on this server; otherwise follow the configuration procedure found in chapter 3 of the *VERITAS Storage Migrator for UNIX System Administrator's Guide*. Use the xhsmadm interface as explained below. Selected file systems should be mounted.

Note Before using VSM commands make sure the path `/usr/opensv/hsm/bin` is included in your search path. You can change the root user's login script to include the path to VSM and NetBackup Media Manager executables. The NetBackup Media Manager executables are in `/usr/opensv/volmgr/bin` directory.

Note If you are using VERITAS Storage Migrator with methods `ct`, `dt`, `mt`, `op`, or `ow`, make sure at least one volume is registered to VSM or in a volume pool VSM is using. Also make sure that the NetBackup Media Manager daemons are active at this time.

2. Start xhsmadm (after defining the `DISPLAY` variable):

```
/usr/opensv/hsm/bin/xhsmadm &
```
3. Create an HSMDEV entry for each file system directory you are going to manage. Selecting each configuration file entry automatically displays the attributes assigned to that entry. You can add entries and edit attributes easily through the xhsmadm interface.

4. Attributes that you include in each configuration file entry are as follows:

Name

Name (*hsmname*) that you assign to this HSMDEV entry. This name must be a unique alphanumeric value, such as *hsm1*

You can use only letters or a combination of letters and numbers with no trailing whitespace. Avoid using only numbers because this can cause some utilities to work incorrectly. Maximum name length is 32 characters. The default is *hsm*. You can configure up to 64 *hsmnames*.

Mount Point

Path name (*fspath*) of the file system for this HSMDEV entry. It is the mount point for the file system. This parameter is required. The full path's *path/filename* (including directories) must be 1023 characters or less for VSM to migrate files.

Caution Always create the database directory in a local file system that VSM does not manage. This prevents deadlocks when migrating files from the database or *workdir* directories.

Database Pathname

Path (*dwpath*) to the database directory and to the *workdir* directory that will contain information about the files migrated from this HSMDEV entry's file system. One of the files in *dwpath/database* is called *migconf*, and it contains the migration parameters for the file system.

The full paths *dwpath/database/filename* and *dwpath/workdir/filename* must be 1023 characters or less. The maximum *filename* recognized in these paths is 64 characters. The default *dwpath* is as follows:
/usr/var/openv/hsm.hsmname.

Logfile Pathname

Path (*lgpath*) to the file that will contain log messages for operations pertaining to the file system and databases. The full path *lgpath* must be less than or equal to 1023 characters. The default is */tmp/hsm.hsmname.log*. Always change the log path to something other than */tmp*, since files in */tmp* can disappear after a reboot or system crash.

State

Specifies whether automatic disk-space management and access to migrated files is Active (1) or Inactive (0) for this file system. The default is Active.

5. Pull down the Configure menu of the main xhsmadm screen and select Add, then pull down the File menu of the main xhsmadm screen and select Save Global Configuration File.



6. Make database directories, `workdir`, and database files for each HSMDEV entry you have created.

Note Before running `setuphsm`, make sure that the managed file system is mounted as the correct type, either `vxfs` for HP-UX or `xfs` for SGI IRIX. Also make sure the system is not in use. Check file system activity with the UNIX `fuser` command. If the file system is not mounted or is busy, `setuphsm` will terminate with unexpected results.

- a. From the main `xhsmadm` screen, click on an entry in the Configuration File Entries field. Then, click on the Configure menu and click Execute `setuphsm` command.
 - b. Repeat for each *hsmname* in your global configuration. The `setuphsm` command gives you the option to specify the name of a subdirectory. A dialog box will appear for you to specify this.
 - c. Use this option when you want to manage the subdirectory rather than the entire file system. This defines where the database files will reside, and where VSM will store working files. It also copies the initial database files into the database directory. The database pathname (*dwpath*) specified in the global configuration file (step 2 on page 37) defines where the database and `workdir` will reside.
7. Customize each VSM file system `migconf` file (configuration file):
 - a. From the main `xhsmadm` screen, double-click on an entry in the Configuration File Entries field. Then, click on the Configure menu and click on Edit Configuration File. This opens the `xhsmadm` edit screen for the database used by the selected filesystem.
 - b. If you are configuring an experimental system, only the file system *FS* and the methods need to be defined at this time.
 - c. To demonstrate VSM and verify correct operation, set the following:
`METHOD1="ad.1.library.HSM"`
 - d. Otherwise, modify the configuration file as determined from your configuration planning as recommended in chapter 2 of the *VERITAS Storage Migrator for UNIX System Administrator's Guide*; chapter 3 of that manual contains a detailed description of the entire configuration process with `xhsmadm`.

- 8.** Register Volumes for VSM use.
 - a.** From the main xhsmadm screen, click on the desired entry in the Configuration File Entries field. Then, click on the Volumes menu and click on the Volume Registration and Reports menu item.
 - b.** Repeat this step for all volumes that VSM will use.



