VERITAS File System™ 3.4

Installation Guide

Solaris

VERITAS

VERITAS File System Installation

This guide describes how to install and upgrade the VERITAS File System™ (VxFS™). Topics include:

Getting Help

For assistance with any of the VERITAS products, contact VERITAS Technical Support:

◆ U.S. and Canadian Customers: 1-800-342-0652

◆ International: +1-650-527-8555

◆ Email: support@veritas.com

For license information:

◆ Phone: 1-650-527-4265

◆ Email: license@veritas.com

◆ Fax: 1-650-527-8428

For software updates:

◆ Phone: 1-650-527-2549

◆ Email: swupdate@veritas.com

For information on purchasing VERITAS products:

◆ Phone: 1-800-258-UNIX (1-800-258-8649) or 1-650-527-8000

◆ Email: vx-sales@veritas.com

For additional information about VERITAS and VERITAS products, visit the Web site at:

http://www.veritas.com

For software updates and additional technical support information, such as TechNotes, product alerts, and hardware compatibility lists, visit the VERITAS Technical Support Web site at:

http://support.veritas.com

Conventions

Typeface	Usage	Examples
monospace	Computer output, files, directories, software elements such as command options, function names, and parameters	Read tunables from the `/etc/vx/tunefstab` file. See the `ls(1)` manual page for more information.
monospace (**bold**)	User input	# **mount -F vxfs /h/filesys**
italic	New terms, book titles, emphasis, variables replaced with a name or value	See the *User's Guide* for details. The variable *ncsize* determines the value of...

Symbol	Usage	Examples
%	C shell prompt	
$	Bourne/Korn shell prompt	
#	Superuser prompt (all shells)	
\	Continued input on the following line; you do not type this character	# **mount -F vxfs ** **/h/filesys**
[ ]	In a command synopsis, brackets indicates an optional argument	`ls [-a]`
|	In a command synopsis, a vertical bar separates mutually exclusive arguments	`mount [suid | nosuid ]`
blue text	Indicates an active hypertext link	In PDF and HTML files, click on links to move to the specified location

Preinstallation Instructions

Before installing the VERITAS File System:

◆ Obtain a license key (see "Obtaining a License Key" on page 4 for details).

◆ Ensure that the directory /opt exists and has write permissions for root.

◆ Confirm that your system has enough free disk space to install VxFS. The following table shows the approximate disk space usage by directory for the VERITAS File System packages:

Directory:	/	/usr	/opt
Size:	1.5 MB	2.25 MB	3.5 MB

Obtaining a License Key

The VERITAS File System is a licensed product. Before you install VxFS, obtain a license key issued by VERITAS Customer Support. To obtain an evaluation license key, contact your sales representative. If you have a VxFS evaluation license key, you must obtain a permanent license key when you purchase the product. The optional VERITAS Quick I/O and QuickLog features require separate license keys.

Note The VERITAS vxlicense command is provided in a separate package named VRTSlic. You must install this package for the licensing process to work.

If you purchase the VERITAS File System through Sun Microsystems, you must also buy a license kit from Sun for each system running VxFS. For information on licensing and support, refer to the license kits rather than the contact information provided in VERITAS File System documentation.

A License Key Request Form is included when you purchase the product. If you do not have a License Key Request Form, contact your sales representative. To obtain a license key, complete the License Key Request Form and send it to VERITAS by fax at 650-335-8428. VERITAS Customer Support will send you a license key by fax or email.

Note Obtain your license key before installing or upgrading the VxFS packages. Be sure to record your license key somewhere other than the computer on which it is installed so that you can find it if the system becomes unbootable or the product requires reinstallation.

You must provide your system's hostid and machine type on the License Key Request Form. To determine the hostid of your system, run either of the following commands:

```
# /usr/sbin/sysdef -h
# hostid
```

To determine the machine type, run either of the following commands:

```
# /usr/sbin/prtconf | head
# uname -i
```

During installation, you are prompted for the license key. If the software is already installed and you are upgrading or replacing an evaluation license with a permanent license, follow the instructions that accompany the license key to replace the old license with the new one.

Note Valid license keys for VxFS 2.3.*x* and earlier VxFS 3.*x* releases also work on VERITAS 3.4 File Systems.

If you have questions concerning licensing, contact VERITAS at one of the phone numbers listed under "Getting Help" on page 2.

Installing VxFS Software for the First Time

Note Only a superuser can install and deinstall the VERITAS File System.

The VERITAS software CD contains these VxFS packages:

◆ VRTSvxfs—VERITAS File System software and manual pages.

◆ VRTSfsdoc—VERITAS File System documentation. During the installation, you are given the choice of installing PostScript, PDF, or both versions of the documents. If you do not want documents online, omit installing the VRTSfsdoc package.

◆ VRTSlic—VERITAS products licensing facility. This package must be installed to activate all VxFS licensable features.

Following the standard procedure for adding any new device driver, use the pkgadd utility to install VERITAS File System packages.

Note During the installation, you are prompted for a license key. If you do not have a license key, see "Obtaining a License Key" on page 4.

Loading the Software from CD

To load the software from CD-ROM:

1. Log in as superuser.

2. Place the VERITAS software CD into a CD-ROM drive connected to your system.

3. If Solaris volume management software is running on your system, when you insert the CD it is automatically mounted as /cdrom/*CD_name*.

4. If Solaris volume management software is not available to mount the CD automatically, you must mount it manually. After inserting the CD, enter:

   ```
   # mount -F hsfs -o ro /dev/dsk/c0t6d0s2 /cdrom/CD_name
   ```

   where c0t6d0s2 is the default address for the CD-ROM drive.

VRTSvxfs Installation Output

VxFS 3.4 runs on Solaris 2.6, 7, or 8. If you try to install it on any other Solaris version, the `pkgadd` procedure will fail and display an error message.

The `VRTSvxfs` package contains binaries for Solaris 2.6, 7, or 8. Procedures built into this package determine the current OS version and install the appropriate VxFS binaries during the `pkgadd` process. On Solaris 7 and 8 systems, both the 32-bit and 64-bit VxFS drivers are installed.

1. To install `VRTSvxfs`, install the VERITAS license package and the VERITAS file system packages in the order shown (the `VRTSfsdoc` package is optional):

   # **pkgadd -d /cdrom/*CD_name*/pkgs VRTSlic VRTSvxfs VRTSfsdoc**

Text similar to the following displays during the installation procedure:

```
VERITAS File System
(sparc) 3.4,REV=GA02
Copyright (c) 1991 - 2000 VERITAS SOFTWARE CORP. ALL RIGHTS
RESERVED. THIS SOFTWARE IS THE PROPERTY OF AND IS LICENSED BY
VERITAS SOFTWARE, AND/OR ITS SUPPLIERS.

Are you installing VRTSvxfs on the local host? [y,n]

## Executing checkinstall script.
Using </> as the package base directory.
## Processing package information.
## Processing system information.
 14 package pathnames are already properly installed.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
The following files are already installed on the system and
are being used by another package:
  /usr/sbin/vxlicense
Do you want to install these conflicting files [y,n,?,q]
```

2. If you see the above message, type **y** to continue with the installation.

```
## Checking for setuid/setgid programs.
The following files are being installed with setuid and/or
setgid permissions:

  /opt/VRTSvxfs/sbin/qioadmin <setuid root>
  /opt/VRTSvxfs/sbin/qiomkfile <setuid root>
  /opt/VRTSvxfs/sbin/vxdump <setuid root setgid tty>
  /opt/VRTSvxfs/sbin/vxquota <setuid root>
  /opt/VRTSvxfs/sbin/vxrestore <setuid root setgid bin>

Do you want to install these as setuid/setgid files [y,n,?,q]
```

3. Type **y** to install these files as `setuid/setgid` files and continue with the installation.

```
This package contains scripts which will be executed with
super-user permission during the process of installing this
package.
Do you want to continue with the installation
of <VRTSvxfs> [y,n,?]
```

4. Type **y** to continue. The package installs the files listed on your screen and ends with:

```
Installation of <VRTSvxfs> was successful.
```

5. Before using VxFS, you must create a license key file. Type:

```
# vxlicense -c
```

6. The system responds with a prompt for the license key. Enter a valid key as in the following example:

```
Please enter your key: 7373 1575 8068 1302 5845 200
```

After you enter a valid key, the system displays text similar to:

```
vrts:vxlicense: INFO: Feature name: VXFS [80]
vrts:vxlicense: INFO: Number of licenses: 1 (non-floating)
vrts:vxlicense: INFO: Expiration date: No expiration date
vrts:vxlicense: INFO: Release Level: 22
vrts:vxlicense: INFO: Machine Class: 258193729
vxfs:vxlicense: INFO: Key successfully installed in
/etc/vx/elm/80.
```

7. To license the optional features, re-enter the `vxlicense -c` command and a valid license key. If you do not have a valid license key, see "Obtaining a License Key" on page 4.

Note See "Loading and Unloading the File System Module" on page 15 for information on starting VxFS without having to do a reboot.

8. Reboot the system.

9. The installation procedure modifies the `/etc/system` file by adding the following lines:

```
* vxfs_START -- do not remove the following lines:
*
* VxFS requires a stack size greater than the default 8K.
* The following values allow the kernel stack size
* for all threads to be increased to 16K.
*
set lwp_default_stksize=0x4000
* vxfs_END
```

The original `/etc/system` file is copied to `/etc/fs/vxfs/system.preinstall`. The modifications are removed during a `pkgrm`.

Upgrading to VxFS Release 3.4 and Solaris 2.6, 7, or 8

If you are already running a previous release of VxFS, you can upgrade to VxFS Release 3.4.

Before You Upgrade

Note If your system has a previous version of the VRTSvxfs package, you must deinstall it before installing the new version. You do not need to remove existing VERITAS File Systems, but all of them must remain unmounted throughout the upgrade process. See "Deinstalling the VxFS Software" on page 17 for more information.

The following table indicates which VxFS releases are supported on each Solaris release. Even though older versions of VxFS are supported, only the current VxFS release is available on the VERITAS software CD.

	Solaris 2.6	Solaris 7	Solaris 8
VxFS 3.4	Supported	Supported	Supported
VxFS 3.3.3	Supported	Supported	Supported
VxFS 3.3.2	Supported	Supported	
VxFS 3.3/3.3.1	Supported		
VxFS 3.2.5	Supported		

1. Determine the current VxFS version and Solaris version you are running:

   ```
   # pkginfo -l VRTSvxfs
   # uname -a
   ```

2. Determine the final Solaris version you want to run with VxFS. For VxFS 3.4, this must be Solaris 2.6, 7, or 8.

Note Be sure you have the correct supporting hardware for the Solaris version you are installing.

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3. Using the information from step 1, step 2, and the table under "Before You Upgrade" on page 10, determine if you need to upgrade the operating system. If you need to upgrade the operating system, make sure there is enough space on your system (see "Preinstallation Instructions" on page 4 for VxFS space requirements).

4. If you have not already done so, obtain the necessary license keys (see "Obtaining a License Key" on page 4 for details).

5. Proceed to the appropriate section for instructions on how to upgrade VxFS and/or the operating system.

To perform this upgrade	Go to this section
VxFS and Solaris	"Upgrading VxFS and Solaris" on page 12
VxFS only	"Upgrading the VERITAS File System Only" on page 13
Solaris only	"Upgrading the Solaris Operating System Only" on page 14

Upgrading VxFS and Solaris

1. Unmount all mounted VxFS file systems.

2. Remove the VxFS packages, starting with the optional package:

    ```
    # pkgrm VRTSfsdoc VRTSvxfs
    ```

3. If you have VxFS file systems specified in the /etc/vfstab file, comment them out before rebooting.

4. Upgrade the operating system to Solaris 2.6, 7, or 8. Refer to the Solaris installation documentation for instructions on how to upgrade Solaris.

5. Load and mount the CD as described in "Loading the Software from CD" on page 6.

6. Add the VxFS packages:

    ```
    # pkgadd -d /cdrom/CD_name/pkgs VRTSlic VRTSvxfs VRTSfsdoc
    ```

7. Undo the changes to /etc/vfstab done in step 3.

8. Most VxFS commands are installed in the /opt/VRTSvxfs/sbin directory, and the online manual pages are installed in the /opt/VRTS/man directory. Be sure to add the command directory to your PATH, and the manual page directory to your MANPATH environment variables (see "Command Installation Verification" on page 16 for information on other VxFS command path names).

Note See "Loading and Unloading the File System Module" on page 15 for information on starting VxFS without having to do a reboot.

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9. Reboot the system to mount any VxFS file systems.

Upgrading the VERITAS File System Only

To upgrade VxFS only:

1. Unmount any mounted VERITAS file systems.

Note If the directory /opt is a VxFS file system, do not unmount it.

---

2. Load and mount the CD as described in "Loading the Software from CD" on page 6. Remove the VxFS packages, starting with the optional package:

```
# pkgrm VRTSfsdoc VRTSvxfs
```

3. Add VxFS packages:

```
# pkgadd -d /cdrom/CD_name/pkgs VRTSlic VRTSvxfs VRTSfsdoc
```

4. Most VxFS commands are installed in the /opt/VRTSvxfs/sbin directory, and the online manual pages are installed in the /opt/VRTS/man directory. Be sure to add the command directory to your PATH, and the manual page directory to your MANPATH environment variables (see "Command Installation Verification" on page 16 for information on other VxFS path names).

Note See "Loading and Unloading the File System Module" on page 15 for information on starting VxFS without having to do a reboot.

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5. Reboot the system.

Upgrading the Solaris Operating System Only

If VxFS 3.4 is already installed when you upgrade Solaris, you must deinstall and reinstall the VxFS 3.4 packages. To do this, follow the instructions in the section "Upgrading VxFS and Solaris" on page 12.

Upgrading the VxFS Disk Layout

VxFS currently supports three file system disk layouts:

◆ Disk layout Version 1

◆ Disk layout Version 2 (with quotas or without quotas)

◆ Disk layout Version 4

Any new file system created using VxFS 3.4 has disk layout Version 4 by default. You can specify other disk layouts using the mkfs command:

```
# mkfs -F vxfs -o version=1 /devicename
# mkfs -F vxfs -o version=2 /devicename
# mkfs -F vxfs -o noquota,version=2 /devicename
```

For better performance, use disk layout Version 4 for all new file systems.

Use the vxupgrade command to upgrade an existing VxFS disk layout to disk layout Version 4 while the file system remains online:

```
# vxupgrade -n 4 /mount_point
```

See the vxupgrade(1M) and fsadm(1M) manual pages for more information on upgrading VxFS file systems.

Loading and Unloading the File System Module

On Solaris 2.6, 7, and 8, the `vxfs` file system module automatically loads on the first reference to a VxFS file system; this occurs when a user tries to mount a VxFS disk layout.

In some instances, you may find it efficient to load the file system module manually. For example, some larger class systems can have many dual interface I/O cards with multiple disk chains attached. Doing a device interrogation on such a system during reboot can be be very time consuming, so you may want to avoid doing a reboot to upgrade your VERITAS File System by simply loading the `vxfs` module using the `modload` command. To do this, first load `vxfs`, then load `vxportal`. `vxportal` is the DMAPI kernel module:

```
# modload /kernel/fs/vxfs
# modload /kernel/drv/vxportal
```

And if you have a license for the VERITAS QuickLog or VERITAS Quick I/O features:

```
# cd /usr/kernel/drv/sparcv9
# modload qlog
# modload fdd
```

To determine if the modules successfully loaded, enter:

```
# modinfo | grep vxportal
# modinfo | grep vxfs
```

The above commands provide information about the modules. The first field in the output is the module ID.

You can unload the module by entering:

```
# modunload -i portal_module_id
# modunload -i vxfs_module_id
```

The `modunload` command fails if any mounted VxFS file systems exist. To determine if any VxFS file systems are mounted, enter:

```
# df -F vxfs
```

Verifying VxFS Installation

The VERITAS File System package consists of a kernel component and administrative utilities.

Kernel Installation Verification

To ensure that the file system driver is loaded, enter:

```
# modinfo | grep vxfs
```

The modinfo command displays information about all modules loaded on the system. If the vxfs module is loaded, you will see an entry corresponding to vxfs. If the file system module is not loaded, follow the instructions in "Loading and Unloading the File System Module" on page 15 to complete the process.

Command Installation Verification

The VERITAS File System commands are installed in three directories:

/opt/VRTSvxfs/sbin	Contains the VERITAS-specific commands.
/usr/lib/fs/vxfs/bin	Contains the VxFS type-specific switch-out commands.
/etc/fs/vxfs	Contains the VERITAS mount command and QuickLog commands required to mount file systems.

Determine whether these subdirectories are present:

```
# ls /etc/fs/vxfs
# ls /usr/lib/fs/vxfs
# ls /opt/VRTSvxfs/sbin
```

List these directories in your PATH environment variable to make the commands accessible.

Using VxFS

After installing VxFS, you can create a VERITAS File System on a disk slice or VERITAS Volume Manager™ (VxVM™) volume with the `mkfs` command. Before you can use this file system, you must mount it with the `mount` command. You can unmount the file system later with the `umount` command. A file system can be automatically mounted at system boot time if you add an entry for it in the `/etc/vfstab` file.

The VERITAS-specific commands are described in the VxFS guides and online manual pages. Refer to the Quick Start Reference appendix of the *VERITAS File System Administrator's Guide* for examples of the most common VxFS operating procedures.

Deinstalling the VxFS Software

You deinstall the VERITAS File System using the `pkgrm` command.

> **Note** The VxFS package cannot be removed if there are any mounted VxFS file systems. Unmount the VxFS file systems before removing the package. After you remove the VxFS package, VxFS file systems are not mountable or accessible until another VxFS package is installed.

1. Check if any VERITAS File Systems or Storage Checkpoints are mounted:

   ```
   # df -F vxfs
   ```

2. First unmount and remove any Storage Checkpoints:

   ```
   # umount /checkpoint_name
   # fsckptadm remove checkpoint_name /mount_point
   ```

   Then unmount any mounted file systems.

3. To remove the VxFS package, enter:

   ```
   # pkgrm VRTSvxfs
   ```

   If the optional `VRTSfsdoc` package is installed, specify it first in the `pkgrm` command. The system responds with a message similar to the following:

   ```
   The following package is currently installed:
     VRTSvxfs        VERITAS File System
     (sparc) 3.4,REV=GA02

   Do you want to remove this package? y
   ```

4. Type **y** to continue with the removal.

```
## Removing installed package instance <VRTSvxfs>
This package contains scripts which will be executed with
superuser permission during the process of removing this package.
 Do you want to continue with the removal of this package
[y,n,?,q]
```

5. Type **y** to continue with the removal.

```
## Verifying package dependencies
## Processing package information.
## Executing preremove script.
## Removing pathnames in class <2.7_64>
. . .
## Removing pathnames in class <2.7>
. . .
## Removing pathnames in class <all>
. . .
## Updating system information.
Removal of <VRTSvxfs> was successful.
```

6. Remove any VxFS file system entries from the `/etc/vfstab` file.