VERITAS™

# VERITAS File System™ 4.0

## Installation Guide

### Solaris

N09924F

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# Contents





# 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: 1-650-527-0300
- Email: license@veritas.com
- Fax: 1-650-527-0952

For software updates:

- Email: swupdate@veritas.com

For information on purchasing VERITAS products:

- Phone: 1-800-327-2232
- Email: sales.mail@veritas.com

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

http://support.veritas.com

**Unique Message Number**

If you encounter a product error message, record the unique message number preceding the text of the message. When contacting VERITAS Technical Support, either by telephone or by visiting the VERITAS Technical Support website, be sure to provide the relevant message number. VERITAS Technical Support will use this message number to quickly determine if there are TechNotes or other information available for you.

A unique message number is an alpha-numeric string beginning with the letter "V". For example, in the message number:

```
V-3-20750: cannot perform log replay
```

the "V" indicates that this is a VERITAS product error message. The text of the error message follows the unique message number.

# 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.<br>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.<br>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`** \<br>**`/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 |



# Packaging Differences in the Sun Microsystems Distribution of VERITAS Products

When you purchase the VERTIAS File System or VERITAS Volume Manager through Sun Microsystems, there are differences in the product CD that affect the installation procedure:

- The VERITAS Installation Menu, and the install and uninstall scripts, are not available.
- Packages and patches are not compressed.
- There is no `file_system` or `volume_manager` directory. The `pkgs`, `patches`, `docs`, `release_notes`, and other directories are at the top level of the CD. Procedures that specify the `file_system` or `volume_manager` directory must be modified. For example, change:

  ```
  # cd /cdrom/cdrom0/file_system/pkgs
  ```

  To:

  ```
  # cd /cdrom/cdrom0/pkgs
  ```

  File locations are also different. For example, the file `vxfs_notes.pdf` is under the `release_notes` directory, not the `file_system/release_notes` directory.
- The following VERITAS Enterprise Administrator patches are available in the `patches` directory and must be installed after VEA is installed:

  115209-xx (for the `VRTSob` VEA package)

  115210-xx (for the `VRTSobgui` VEA GUI client package)

  115212-xx (for the `VRTSmuob` VEA Service Localized package)

# Preinstallation Instructions

Before installing the VERITAS File System:

- There are multiple CDs in the product distribution from VERITAS. The contents of a disc are shown on the disc label.
- Review the *VERITAS File System Release Notes*, `vxfs_notes.pdf` located on the VERITAS software disc under the `file_system/release_notes` directory.

  Because product release notes are not installed by any packages, VERITAS recommends that you copy them from the software disc to the `/opt/VRTS/doc` directory so that they are available for future reference.
- In the *VERITAS File System Release Notes*, review the information on `VRTSexplorer` and installing the `VRTSspt` package. `VRTSspt` is a group of tools for troubleshooting a system and collecting information on its configuration. The tools can gather VxFS metadata information and establish various benchmarks to measure file system performance. The tools are not required for operation of any VERITAS product, and they may adversely impact system performance if not used correctly. VERITAS provides these tools to analyze systems if you suspect that there are performance problems, and should be used only under the direction of a VERITAS Technical Support Engineer.
- Obtain a license key (see "Product Licensing" on page 7 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: | / | /opt | /usr | /var |
|---|---|---|---|---|
| VRTSvxfs | 5.7 MB | 14.5 MB | 4.3 MB | 50K |
| VRTSfppm | 20K | 1 MB | 0 | 20K |
| VRTSfsdoc | 10K | 1.6 MB | 0 | 10K |
| VRTSfsman | 20K | 450K | 0 | 20K |
| VRTSfspro | 10K | 3.4 MB | 0 | 20K |
| VRTSap | 10K | 29 MB | 10K | 20K |
| VRTStep | 40K | 5.2 MB | 10K | 10K |
| VRTSob/ VRTSobgui | | 80 MB | | |
| VRTSperl | | 33 MB | | |
| VRTSvlic | | 1 MB | 1 MB | |
| Total: | 6 MB | 120 MB | 6 MB | 1 MB |
| VRTSjafsc | 10K | 920K | 0 | 10K |
| VRTSjafsd | 10K | 1.6 MB | 0 | 10K |
| VRTSjafsm | 10K | 1.45 MB | 0 | 30K |
| VRTSmufp | 10K | 40K | 0 | 10K |
| VRTSmufsp | 10K | 600K | 0 | 10K |
| VRTSmutep | 10K | 1.5 MB | 0 | 10K |
| VRTSmuap | 10K | 20K | 0 | 10K |
| Total | 70K | 6.13 MB | 0 | 90K |

## Product Licensing

The VERITAS File System is a licensed product. Before you install VxFS, obtain a license key from VERITAS. If you have a temporary license key, you must obtain a permanent license key when you purchase the product. A License Key Request Form is included in the product package. The License Key Request Form has all the information required to establish a user account on the VERITAS vLicense™ website and generate your license key. If you do not receive this form, contact your sales representative, or send an email with your sales order number to license@veritas.com.

To obtain a product license, use the vLicense website (see below), or complete the License Key Request Form, including your system's host ID and model type. Sign and date the completed form and fax it to VERITAS. You will receive a license key by email within a few business days. Retain the License Key Request Form for your records.

## Using the VERITAS vLicense Website to Obtain a License

You can access the vLicense website at:

http://www.veritas.com/vlicense

To obtain a license from the website, provide the following information shown on the License Key Request Form:

- Your customer number
- Your order number
- Your serial number

To determine the host ID of your system, enter:

```
# hostid
```

To determine the machine type, enter:

```
# uname -i
```

After receiving a license key, record the number somewhere other than on the system where it is installed so that you can access it if the system becomes inoperable or the product requires reinstallation.



During the installation procedure, you must enter a license key. If you are replacing a temporary license with a permanent license, follow the instructions that accompany the license key to replace the old license with the new one.

The VERITAS licensing commands are provided in the software package `VRTSvlic`. The `VRTSvlic` package must be installed for the licensing process to work.

If you have any questions about licensing, contact VERITAS at the license information numbers listed under "Getting Help" on page 2.

## Component Product Licensing

A Storage Foundation key licenses both VxVM and VxFS. A Storage Foundation HA key licenses VxVM, VxFS, and VCS. During an individual product installation, you are prompted for the license key. When you enter a Storage Foundation or Storage Foundation HA key, it automatically licenses the other products. This means you do not have to re-enter a license key when you install another Storage Foundation component product.

## VERITAS Licensing Commands

The VERITAS licensing commands are provided in a software package named `VRTSvlic`. You must install the `VRTSvlic` package for the licensing process to work. There are three licensing commands:

| | |
|---|---|
| `vxlicinst` | Licenses a VERITAS product already installed on a system. |
| `vxlicrep` | View currently installed licenses. |
| `vxlictest` | Retrieves features that are encoded in a license key along with their descriptions. |

You can review the descriptions and available options for these commands in the online manual pages installed with the `VRTSvlic` package.

# Upgrading to VxFS Release 4.0 and Solaris 7, 8, or 9

If you are running a previous release of VxFS, you can upgrade to VxFS Release 4.0.

## Before You Upgrade

If your system has a previous version of the `VRTSvxfs` package, you must uninstall it before installing the new version. You do not need to remove existing VxFS file systems, but all VxFS file systems must be unmounted before doing the upgrade. If any VxFS file systems are mounted with the `qlog` option, they must be QuickLog disabled before installing VxFS 4.0. See "Uninstalling VERITAS File System Software" on page 24 for more information. If your system has the VxFS NetBackup libraries package (`VRTSfsnbl`) installed, remove it before installing VxFS 4.0.

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

| | **Solaris 7** | **Solaris 8** | **Solaris 9** |
|---|---|---|---|
| **VxFS 4.0** | Supported | Supported | Supported |
| **VxFS 3.5** | Supported | Supported | Supported |
| **VxFS 3.4** | Supported | Supported | Supported |
| **VxFS 3.3.3** | Supported | Supported | Supported |
| **VxFS 3.3.2** | Supported | | |



1. Determine which VxFS version and Solaris version you are running:

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

2. Determine the final Solaris version to run with VxFS. For VxFS 4.0, this must be Solaris 7, 8, or 9.

3. Using the information from step 1, step 2, and the table under "Before You Upgrade" on page 9, determine if you need to upgrade the operating system. If so, make sure there is enough space on your system (see "Preinstallation Instructions" on page 5 for VxFS space requirements).

4. Disk layout Version 1 and Version 2 file systems cannot be mounted on VxFS 4.0. Determine if you have any Version 1 and Version 2 file systems mounted and follow the instructions in "Upgrading VxFS Disk Layout Versions" on page 27.

5. If you have not already done so, obtain a license key (see "Product Licensing" on page 7).

6. Go to the instructions on how to upgrade the operating system, VxFS, or both.

| To perform this upgrade | Go to this section |
|---|---|
| Solaris only | "Upgrading the Solaris Operating System Only" on page 10 |
| VxFS and Solaris | "Upgrading VxFS and Solaris" on page 11 |
| VxFS only | "Upgrading the VERITAS File System Only" on page 11 |

## Upgrading the Solaris Operating System Only

If VxFS 4.0 is already installed when you upgrade Solaris, uninstall and reinstall the VxFS 4.0 packages as described in "Upgrading VxFS and Solaris" on page 11.

## Upgrading VxFS and Solaris

1. Unmount all VxFS file systems and Storage Checkpoints as described in "Uninstalling VERITAS File System Software" on page 24.

2. Remove VxFS packages using either the `uninstallfs` script as described in "Uninstalling Using the uninstallfs Script" on page 25, or using the `pkgrm` command as described in the section "Uninstalling Using the pkgrm Command" on page 26.

3. If you have VxFS file systems specified in the `/etc/vfstab` file, comment them out before rebooting, but do not remove the entries.

4. Upgrade the operating system to Solaris 7, 8, or 9. Refer to the Solaris installation documentation for instructions.

5. Add the VxFS packages as described in "Installing VxFS Using the installfs Script" on page 16 or "Installing VxFS Using pkgadd Command" on page 21.

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

## Upgrading the VERITAS File System Only

1. Unmount all VxFS file systems and Storage Checkpoints as described in "Uninstalling VERITAS File System Software" on page 24.

2. Remove VxFS packages using either the `uninstallfs` script as described in "Uninstalling Using the uninstallfs Script" on page 25, or using the `pkgrm` command as described in the section "Uninstalling Using the pkgrm Command" on page 26.

3. If you have VxFS file systems specified in the `/etc/vfstab` file, comment them out before rebooting, but do not remove the entries.

4. Add the VxFS packages as described in "Installing VxFS Using the installfs Script" on page 16 or "Installing VxFS Using pkgadd Command" on page 21.

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



# Installing VERITAS File System Software

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

There are multiple CDs in the product distribution from VERITAS. Read the disc label for the location of VxFS. The following file system packages are in the `file_system/pkgs` directory of the disc:

| | |
|---|---|
| `VRTSvxfs` | VERITAS File System software |
| `VRTSfsman` | VERITAS File System online manual pages |
| `VRTSfsdoc` | VERITAS File System documentation in PDF format. If you do not want documents online, omit installing the `VRTSfsdoc` package. |
| `VRTSvlic` | VERITAS products licensing facility. This package must be installed to activate all VxFS licensable features. |
| `VRTSperl` | VERITAS Perl 5.8.0 Redistribution |
| `VRTSfppm` | VERITAS File Placement Policy Manager |

**Note** Not all packages are included on the VxFS disc when purchased through Sun Microsystems.

The file system-related packages listed below are also in the `file_system/pkgs` directory. These package are installed when VxFS is installed using the VERITAS Installation Menu (see "VERITAS Installation Menu" on page 14).

| | |
|---|---|
| VRTSfspro | VERITAS File System Management Services Provider |
| VRTSob | VERITAS Enterprise Administrator Service |
| VRTSobgui | VERITAS Enterprise Administrator |
| VRTSmuob | VERITAS Enterprise Administrator Localized Package |
| VRTSap | VERITAS Action Provider |
| VRTStep | VERITAS Task Exec Provider |

VRTSfspro, VRTSob, VRTSobgui, VRTSmuob, VRTSap, and VRTStep are part of the VERITAS Enterprise Administrator (VEA) GUI. These packages are typically used with the VERITAS Volume Manager or VERITAS Storage Foundation products, and are not required for VxFS to operate. These packages may require patches. See the *VERITAS Volume Manager Installation Guide* for more installation information.

| | |
|---|---|
| VRTSspt | VERITAS Software Support Tools |

The VRTSexplorer program assists VERITAS Customer Support engineers in diagnosing technical problems associated with VERITAS products. The VRTSexplorer program is in the VRTSspt package. VRTSspt is in the support directory of the VERITAS software disc. For more information about the VRTSexplorer program, consult the README file located in the support directory.

## Japanese Language Packages

The following packages are installed for the Japanese language version of VxFS.

| | |
|---|---|
| VRTSjafsc | VERITAS File System Japanese Language Message Catalog |
| VRTSjafsd | VERITAS File System Japanese Language documentation in PDF format. If you do not want documents online, omit installing the VRTSfsdoc package. |
| VRTSjafsm | VERITAS File System Japanese Language online manual pages |
| VRTSmufp | Multi Language VERITAS File Placement Policy Manager |
| VRTSmufsp | Multi Language VERITAS File System Management Services Provider |
| VRTSmutep | Multi Language VERITAS Task Exec Provider |
| VRTSmuap | Multi Language VERITAS Action Provider |



## VERITAS Installation Menu

VERITAS products distributed by VERITAS have an automated installation and licensing procedure that lets you install packages using an Installation Menu, or invoke installation scripts from the command line. Alternatively, you can install VxFS using the `pkgadd` command. The *Getting Started Guide*, included with the VERITAS product software discs, provides information on using the Installation Menu. Review the *Getting Started Guide* before installing VxFS.

**Note** The VERITAS Installation Menu and the install and uninstall scripts are not available on the CD when you purchase the VERITAS File System through Sun Microsystems.

## Mounting the Software Disc

1. Log in as superuser.
2. Place the VERITAS software disc into a CD-ROM drive connected to your system.

**Note** There are multiple CDs in the product distribution from VERITAS. Read the disc label for the location of VxFS.

3. If Solaris volume management software is running on your system, the CD automatically mounts as `/cdrom/cdrom`0.
4. If Solaris volume management software is not available to mount the CD, you must mount it manually. After inserting the CD, enter:

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

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

# VxFS Installation

VxFS 4.0 runs on Solaris 7, 8, or 9. If you try to install it on any other Solaris version, the `pkgadd` procedure will fail and display an error message.

**Note** You can no longer create or mount Version 1 or Version 2 disk layout file systems. However, you can upgrade them to make them usable on VxFS 4.0 (see "Upgrading VxFS Disk Layout Versions" on page 27).

The `VRTSvxfs` package contains binaries for all three of these Solaris OS versions. Procedures built into this package determine the current OS version and install the appropriate VxFS binaries. On Solaris 7, 8, and 9 systems, both the 32-bit and 64-bit VxFS drivers are installed.

If you are upgrading VxFS from a previous version, go to "Upgrading VxFS Disk Layout Versions" on page 27.

You can install VxFS using the VERITAS Installation Menu, using the `installfs` script, or using the `pkgadd` command.

## Installing VxFS Using the VERITAS Installation Menu

To start the Installation Menu, move to the `cdrom0` directory and enter the `installer` command:

```
# cd /cdrom/cdrom0
# ./installer
```

The installer guides you through the procedure. The steps are the same as shown under "Installing VxFS Using the installfs Script".



## Installing VxFS Using the installfs Script

1. To install VRTSvxfs using installfs, move to the file_system directory:

   # **cd /cdrom/cdrom0/file_system**

2. Run the VxFS installation script:

   # **./installfs**

   ```
   VERITAS FILE SYSTEM 4.0 INSTALLATION PROGRAM
   Copyright (c) 2003 VERITAS Software Corporation.
   All rights reserved.
   .
   .
   .
   ```

3. The installation program prompts for a system name. Enter one or more system names, separated by a space, on which to install VxFS, for example, **host1**:

   ```
   Enter the system names separated by spaces on which to
   install VxFS: host1

   Checking OS version on host1 ..................... SunOS 5.9
   Checking VRTSvxfs package ..................... not installed
   Initial system check completed successfully.
   Press [Return] to continue:

            VERITAS FILE SYSTEM 4.0 INSTALLATION PROGRAM

   VERITAS Infrastructure package installation:

   Installing VERITAS Infrastructure packages on host1:
   Checking VRTScpi package ..................... not installed
   Checking VRTSvlic package ..................... not installed
   Checking file system space ........ required space is available
   Installing VRTScpi 4.0.3 on host1 ..................... Done
   Installing VRTSvlic 3.02.003 on host1 ................. Done
   VERITAS Infrastructure packages installed successfully.
   Press [Return] to continue:
   ```

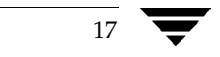
4. The system responds with a prompt for the license key. Enter a valid key as shown in the following example:

```
VxFS Licensing Verification:
Checking VxFS license key on host1 ..... not licensed
Enter a VxFS license key for host1:[?]ABCD-FGHI-JKLM-NOPQ-RSTU-V
Registering VERITAS Storage Foundation Enterprise PERMANENT key
  on spd23

Do you want to enter another license key for host1? [y,n,q,?] (n)

VxFS licensing completed successfully.
Press [Return] to continue:
```

5. Next you can install the optional packages:

```
          VERITAS FILE SYSTEM 4.0 INSTALLATION PROGRAM

 installfs can install the following optional VxFS packages:
VRTSobgui    VERITAS Enterprise Administrator
VRTStep      VERITAS Task Provider
VRTSap       VERITAS Action Provider
VRTSfsman    VERITAS File System Manual Pages
VRTSfsdoc    VERITAS File System Documentation

  1)  Install all of the optional packages
  2)  Install none of the optional packages
  3)  View package descriptions and select optional packages

Select the optional packages to be installed on
all systems? [1-3,q,?] (1) 1

      VERITAS FILE SYSTEM 4.0 INSTALLATION PROGRAM

installfs will install the following VxFS packages:
VRTSperl     VERITAS Perl 5.8.0 Redistribution
VRTSob       VERITAS Enterprise Administrator Service
VRTSmuob     VERITAS Enterprise Administrator Service Localized
             Package
VRTSobgui    VERITAS Enterprise Administrator
VRTSvxfs     VERITAS File System
VRTStep      VERITAS Task Provider
VRTSap       VERITAS Action Provider
VRTSfspro    VERITAS File System Management Services Provider
VRTSfppm     VERITAS File Placement Policy Manager
VRTSfsman    VERITAS File System Manual Pages
VRTSfsdoc    VERITAS File System Documentation
Press [Return] to continue:
```





**6.** The program then checks the system and VxFS installation requirements and installs the packages:

```
                VERITAS FILE SYSTEM 4.0 INSTALLATION PROGRAM

Checking system installation requirements:
Checking VxFS installation requirements on host1:
Checking VRTSperl package ....... version 4.0.1 not installed
Checking VRTSob package ..................... not installed
Checking VRTSmuob package ................... not installed
Checking VRTSobgui package .................. not installed
Checking VRTSvxfs package ................... not installed
Checking VRTStep package .................... not installed
Checking VRTSap package ..................... not installed
Checking VRTSfspro package .................. not installed
Checking VRTSfppm package ................... not installed
Checking VRTSfsman package .................. not installed
Checking VRTSfsdoc package .................. not installed
Checking VERITAS patch 115209 ............... not installed
Checking VERITAS patch 115212 ............... not installed
Checking VERITAS patch 115210 ............... not installed
Checking file system space ...... required space is available
Checking vxsvc process ...................... not running
Checking vxportal driver .................... not running
Checking fdd driver ......................... not running
Checking qlog driver ........................ not running
Checking vxfs driver ..................... vxfs module loaded
Unloading vxfs module on spd23 ........... vxfs unload failed

Because kernel driver modules failed to unload, you must reboot
your system after the installation has completed.

Installation requirement checks completed successfully.
Press [Return] to continue:
```

```
                VERITAS FILE SYSTEM 4.0 INSTALLATION PROGRAM

Installing File System 4.0 on host1:
Installing VRTSperl 4.0.2 on spd23 .......... Done 1 of 14 steps
Installing VRTSob 3.2.514.0 on spd23 ........ Done 2 of 14 steps
Installing VRTSmuob 3.2.514.0 on spd23 ...... Done 3 of 14 steps
Installing VRTSobgui 3.2.514.0 on spd23 ..... Done 4 of 14 steps
Installing VRTSvxfs 4.0 on spd23 ............ Done 5 of 14 steps
Installing VRTStep 1.20.025 on spd23 ........ Done 6 of 14 steps
Installing VRTSap 2.00.015 on spd23 ......... Done 7 of 14 steps
Installing VRTSfspro 4.0 on spd23 ........... Done 8 of 14 steps
Installing VRTSfppm 4.0 on spd23 ............ Done 9 of 14 steps
Installing VRTSfsman 4.0 on spd23 ........... Done 10 of 14 steps
Installing VRTSfsdoc 4.0 on spd23 ........... Done 11 of 14 steps
Adding patch 115209-03 on spd23 ............. Done 12 of 14 steps
Adding patch 115212-04 on spd23 ............. Done 13 of 14 steps
Adding patch 115210-03 on spd23 ............. Done 14 of 14 steps
File System installation completed successfully.
Press [Return] to continue:
```

**7.** The program displays the following summary after completing the installation:

```
                VERITAS FILE SYSTEM 4.0 INSTALLATION PROGRAM

Installation of File System 4.0 has completed successfully.
The installation summary is saved at:

  /opt/VRTS/install/logs/installfs831145046.summary

The installfs log is saved at:

  /opt/VRTS/install/logs/installfs831145046.log

The installation response file is saved at:

  /opt/VRTS/install/logs/installfs831145046.response

Reboot all systems on which VxFS was installed or upgraded.
  shutdown -y -i6 -g0

See the VERITAS File System Administrators Guide for information
on using VxFS.
```

where the time stamp “831145046” is August 31st at the time 14:50:46.

**Note** See “Loading and Unloading the File System Module” on page 30 for information on starting VxFS without having to reboot.

**8.** Reboot the systems on which VxFS was installed. On every host, enter:

```
# shutdown -y -i6 -g0
```



9. Symbolic links to the VxFS commands and the online manual pages are installed in the `/opt/VRTS/bin` directory and the `/opt/VRTS/man` directory, respectively. 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 29 for information on other VxFS command path names).

10. The installation procedure modifies the `/etc/system` file on each host 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 value allows the kernel stack size to be
* increased to 24K for Solaris 7, 8 and 9.
set lwp_default_stksize=0x6000
* vxfs_END
```

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

11. If you are upgrading VxFS, continue with "Upgrading VxFS Disk Layout Versions" on page 27. If you performed a fresh installation, go to "Verifying VxFS Installation" on page 29.

## Installing VxFS Using pkgadd Command

VERITAS product packages are compressed using GNU compression utilities before writing them to distribution media. VERITAS provides the `gunzip` utility on the VERITAS Storage Solutions software discs so that you can decompress the packages before installing VxFS using the `pkgadd` command.

**Note** The VERITAS product packages are not compressed when you purchase the VERITAS File System through Sun Microsystems.

1. After mounting the VERITAS software disc that contains the file system packages, copy the contents of the `file_system/pkgs` directory to a directory on your system:

   ```
   # cp -r /cdrom/cdrom0/product_name/pkgs .
   ```

2. Uncompress the compressed packages:

   ```
   # /cdrom/cdrom0/file_system/scripts/install/gunzip *.gz
   ```

3. Extract each archived package that you want to install:

   ```
   # tar xv package_name.tar
   ```

4. To install `VRTSvxfs` using `pkgadd`, install the VERITAS license package and the VERITAS file system packages in the order shown:

   ```
   # pkgadd -d installation_directory VRTSvlic VRTSvxfs VRTSob \
   VRTSfspro VRTSfppm VRTSmuob VRTStep VRTSap VRTSfsman VRTSfsdoc
   ```

   The `VRTSfsman` and `VRTSfsdoc` packages are optional.

   Text similar to the following displays during the installation procedure:

   ```
   VERITAS File System
   (sparc) 4.0,REV=GA05
   Copyright (c) 1991 - 2003 VERITAS SOFTWARE CORP. ALL RIGHTS
   RESERVED. THIS SOFTWARE IS THE PROPERTY OF AND IS LICENSED BY
   VERITAS SOFTWARE, AND/OR ITS SUPPLIERS.

   ## Executing checkinstall script.
   Using </> as the package base directory.
   ## Processing package information.
   ## Processing system information.
      37 package pathnames are already properly installed.
   ## Verifying package dependencies.
   ## Verifying disk space requirements.
   ## Checking for conflicts with packages already installed.
   ```



```
## 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]
```

5. Type **y** to install these files as `setuid/setgid` files and continue 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,?]
```

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

```
Installation of <VRTSvxfs> was successful.

*** IMPORTANT NOTICE ***
   This machine must now be rebooted to ensure sane operation.
   Execute
          shutdown -y -i6 -g0
   and wait for the "Console Login:" prompt.
```

7. Symbolic links to the VxFS commands and the online manual pages are installed in the `/opt/VRTS/bin` directory and the `/opt/VRTS/man` directory, respectively. Be sure to add the command directory to the end of your PATH, and the manual page directory to your MANPATH environment variables (see "Command Installation Verification" on page 29 for information on other VxFS command path names).

8. Before rebooting the system and using VxFS, you must enter a license key. Enter the license installation command:

```
# vxlicinst
```

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

```
VERITAS License Manager vxlicinst utility version 3.02.001
Copyright (C) VERITAS Software Corp 2003. All Rights reserved.

Please enter your key: ABCD-EFGH-IJKL-MNOP-QRS-TU

License key installed successfully for VERITAS File System
```

**Note** See "Loading and Unloading the File System Module" on page 30 for information on starting VxFS without having to do a reboot.

10. Install the following VERITAS Enterprise Administrator patches. The patches must be copied from the `patches` directory on the CD and uncompressed with the `gunzip` utility. See step 2 on page 21 for information on using `gunzip`.

```
# patchadd 115209-xx 115210-xx 115212-xx
```

**Note** In the Sun Microsystems distribution of VxFS, these patches are not compressed.

11. Halt and reboot the system.

```
# reboot
```

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

```
* vxfs_START -- do not remove the following lines:
* VxFS requires a stack size greater than the default 8K.
* The following value allows the kernel stack size to be
* increased to 24K for Solaris 7, 8 and 9.
set lwp_default_stksize=0x6000
* vxfs_END
```

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

13. If you are upgrading VxFS, continue with "Upgrading VxFS Disk Layout Versions" on page 27. If you performed a fresh installation, go to "Verifying VxFS Installation" on page 29.



# Uninstalling VERITAS File System Software

You can uninstall the VERITAS File System using the `uninstallfs` script or using the `pkgrm` command.

**Note** The VxFS package cannot be removed if there are any mounted VxFS file systems. Do not make `/opt` a VxFS file system.

Unmount all 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. It is advisable to back up VxFS file systems before installing a new VxFS package. If VxFS will not be installed again, all VxFS file systems must be converted to a new file system type.

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

   ```
   # df -F vxfs
   ```

2. Disable QuickLog logging on any file systems mounted with the `qlog` option:

   ```
   # qlogdisable qlogdev mount_point
   ```

3. Unmount and remove any Storage Checkpoints:

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

4. Unmount any mounted file systems.

Continue with either "Uninstalling Using the uninstallfs Script" or "Uninstalling Using the pkgrm Command."

## Uninstalling Using the uninstallfs Script

1. Mount the VxFS software disc (see "Mounting the Software Disc" on page 14) and move to the `file_system` directory:

   ```
   # cd /cdrom/cdrom0/file_system
   ```

2. Run the VxFS uninstall script:

   ```
   # ./uninstallfs
   ```

3. The uninstall script prompts for system name. Enter one or more system names, separated by a space, from which to uninstall VxFS, for example, **`host1`**:

   ```
   Enter the system names separated by spaces from which to
   uninstall VxFS: host1
   ```

4. After the uninstall completes, remove any VxFS file system entries from the `/etc/vfstab` file.



## Uninstalling Using the pkgrm Command

1. Remove the VxFS packages using the `pkgrm` command, starting with the optional packages. Do not remove the license packages `VRTSvlic` or `VRTSlic` if there are other VERITAS products installed.

   ```
   # pkgrm VRTSfsdoc VRTSfsman VRTSap VRTStep VRTSmuob VRTSfppm \
   VRTSfspro VRTSob VRTSvxfs
   ```

   **Note** If the `VRTSqio` package is installed, remove it. If the `VRTSfsnbl` package is installed, remove it also.

   The system responds with a message similar to the following:

   ```
   The following package is currently installed:
     VRTSvxfs        VERITAS File System
     (sparc) 4.0,REV=GA02

   Do you want to remove this package?
   ```

2. Type **y** to continue 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]
   ```

3. Type **y** to continue the removal.

   ```
   ## Verifying package dependencies
   ## Processing package information.
   ## Executing preremove script.
   ## Removing pathnames in class <s28b64>
   . . .
   ## Removing pathnames in class <s28>
   . . .
   ## Removing pathnames in class <man>
   . . .
   ## Removing pathnames in class <all>
   . . .
   ## Updating system information.
   Removal of <VRTSvxfs> was successful.
   ```

4. After the uninstall completes, remove any VxFS file system entries from the `/etc/vfstab` file.

# Upgrading VxFS Disk Layout Versions

VxFS 4.0 allows mounting of three file system disk layouts:

- Disk layout Version 4
- Disk layout Version 5
- Disk layout Version 6

Disk layout Version 1 and Version 2 are not supported on VxFS 4.0. VxFS 4.0 is the last major release to support disk layout Version 4 and Version 5. Any file system created on VxFS 4.0 uses disk layout Version 6 by default, but you can specify the Version 4 or Version 5 disk layout using the `mkfs` command:

```
# mkfs -F vxfs -o version=5 /devicename
```

To determine the disk layout version of a VxFS file system, run the `fstyp` command on the file system physical device. For example:

```
# /opt/VRTS/bin/fstyp –v /dev/vx/dsk/rootdg/volname | grep version
magic a501fcf5  version 6  ctime Thu Jul 31 11:29:31 2003
```

## When to Upgrade Disk Layout Versions

To use of the extended features available in the VxFS 4.0 release, upgrade older disk layout versions to disk layout Version 6 (see the *VERITAS File System Release Notes* for information on new features in VxFS 4.0).

VxFS 4.0 is the last release to support the VxFS QuickLog feature in its current format. QuickLog can still be used on file systems with the Version 4 or Version 5 disk layout, but not on Version 6 disk layouts. If any VxFS file systems are mounted with the `qlog` option, they must be QuickLog disabled before installing VxFS 4.0:

```
# qlogdisable qlogdev mount_point
```

See the *VERITAS File System Administrator's Guide* for information on migrating QuickLog devices to the multi-volume support function.

## When to Use vxupgrade or vxfsconvert

You can use the `vxupgrade` command to upgrade an earlier VxFS disk layout to disk layout Version 6 while the file system remains mounted.

You can use the `vxfsconvert` command to upgrade an earlier VxFS disk layout to a higher disk layout version when the file system is unmounted.



Disk layout Version 1 and Version 2 cannot be mounted on VxFS 4.0. You can upgrade these layout versions online before installing VxFS 4.0, or upgrade them using `vxfsconvert` after installing VxFS 4.0, as shown in the following table:

| | **Disk Layout Version 1** | **Disk Layout Version 2** | **Disk Layout Version 4** | **Disk Layout Version 5** |
|---|---|---|---|---|
| **VxFS Release 3.5.2 or lower** | Use `vxupgrade` to upgrade to disk layout Version 4 or Version 5. | | | |
| **VxFS Release 4.0 or higher** | Use `vxfsconvert` to upgrade to disk layout Version 4. | | Use `vxupgrade` to upgrade to disk layout Version 5 or Version 6. | |

The vxupgrade command does not upgrade previous disk layouts directly to Version 6. You must upgrade older disk layouts in stages. For example, a Version 4 file system disk layout must first be upgraded to Version 5, then to Version 6, in two separate invocations of the command:

```
# vxupgrade -n 5 /mount_point
# vxupgrade -n 6 /mount_point
```

The `vxfsconvert` command converts any older disk layout versions directly to Version 5, but you must use `vxupgrade` to convert from Version 5 to Version 6. See the `vxfsconvert`(1M), `vxupgrade`(1M), and `fsadm`(1M) manual pages for more information on upgrading VxFS file systems.

**Note** The contents of intent logs created on previous disk layout versions cannot be used after the disk layout version is upgraded.

## Space and Time Requirements for Upgrading to Disk Layout Version 6

Converting a Version 5 disk layout to Version 6 disk layout requires adequate free space to complete. The space and time required to complete the upgrade increases with the number of files, extended attributes, and hard links in the file system. Typical maximum space is at least two additional inodes with one block for every inode. Allow at least ten minutes to upgrade for every million inodes in the file system.

# Verifying VxFS Installation

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

## 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 not, follow the instructions in "Loading and Unloading the File System Module" on page 30 to complete the process.

## Command Installation Verification

The VERITAS File System commands are installed in four directories:

| | |
|---|---|
| `/etc/fs/vxfs` | Contains the VERITAS `mount` command and QuickLog commands required to mount file systems. |
| `/usr/lib/fs/vxfs/bin` | Contains the VxFS type-specific switch-out commands. |
| `/opt/VRTSvxfs/sbin` | Contains the VERITAS-specific commands. |
| `/opt/VRTS/bin` | Contains symbolic links to all VERITAS-specific commands installed in the directories listed above. |

Determine whether these subdirectories are present:

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

Add only the symbolic link directory at the end of your PATH environment variable to make all VERITAS product commands accessible as shown in the following Korn Shell example:

```
PATH=$PATH:/opt/VRTS/bin; export PATH
```



# Loading and Unloading the File System Module

On Solaris 7, 8, and 9, 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 want to load the file system module manually. To do this, first load `vxfs`, then `vxportal`. `vxportal` is a pseudo device driver that enables VxFS commands to issue ioctls to the VxFS modules even when there are no file systems mounted on the system.

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

If you have a license for the VERITAS QuickLog or VERITAS Quick I/O features, you can load their kernel modules:

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

# 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 -F vxfs` command. Before you can use this file system, you must mount it with the `mount -F vxfs` 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.

**Note** The VxFS package cannot be removed if there are any mounted VxFS file systems. For this reason, it is advisable not to make `/opt` a VxFS file system.

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.



# Installing Language Packages

You can install the VxFS language packages using the installation script on the language disc, or using the `pkgadd` command.

## Installing Language Packages Using the Installation Script

1. The VERITAS Enterprise Administrator server cannot be running when you install language packages. If VEA is runnings, stop it by entering the command:

   ```
   # /etc/init.d/isisd stop
   ```

2. Insert the language disc into the CD-ROM drive (see "Mounting the Software Disc" on page 14).

3. Move to the `cdrom0` directory and enter the language package installation command:

   ```
   # cd /cdrom/cdrom0
   # ./install_lp
   ```

4. Restart the VEA server:

   ```
   # /etc/init.d/isisd start
   ```

## Installing Language Packages Using the pkgadd Command

1. The VERITAS Enterprise Administrator server cannot be running when you install language packages. If VEA is runnings, stop it by entering the command:

   ```
   # /etc/init.d/isisd stop
   ```

2. Insert the language disc into the CD-ROM drive (see "Mounting the Software Disc" on page 14).

3. Move to the `file_system/pkgs` directory:

   ```
   # cd /cdrom/cdrom0/ja/file_system/pkgs
   ```

4. Install the packages:

   ```
   # pkgadd -d . VRTSmulic VRTSmuobg VRTSjafsc VRTSjafsd \
   VRTSjafsm VRTSmuap VRTSmufsp VRTSmufp VRTSmutep
   ```

5. Restart the VEA server:

   ```
   # /etc/init.d/isisd start
   ```