VERITAS™

VERITAS Storage Foundation 4.0

Release Notes

Solaris

Disclaimer

The information contained in this publication is subject to change without notice. VERITAS Software Corporation makes no warranty of any kind with regard to this manual, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. VERITAS Software Corporation shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this manual.

Copyright

Copyright © 2004 VERITAS Software Corporation. All rights reserved. VERITAS, VERITAS Software, the VERITAS logo, VERITAS Storage Foundation, and all other VERITAS product names and slogans are trademarks or registered trademarks of VERITAS Software Corporation in the USA and / or other countries. Other product names mentioned herein may be trademarks or registered trademarks of their respective companies.

VERITAS Software Corporation
350 Ellis Street
Mountain View, CA 94043
USA
Phone 650–527–8000
Fax 650–527–2908
http://www.veritas.com

Data Encryption Standard (DES) Copyright

Copyright © 1990 Dennis Ferguson. All rights reserved.

Commercial use is permitted only if products that are derived from or include this software are made available for purchase and / or use in Canada. Otherwise, redistribution and use in source and binary forms are permitted.

Copyright 1985, 1986, 1987, 1988, 1990 by the Massachusetts Institute of Technology. All rights reserved.

Export of this software from the United States of America may require a specific license from the United States Government. It is the responsibility of any person or organization contemplating export to obtain such a license before exporting.

WITHIN THAT CONSTRAINT, permission to use, copy, modify, and distribute this software and its documentation for any purpose and without fee is hereby granted, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation, and that the name of M.I.T. not be used in advertising or publicity pertaining to distribution of the software without specific, written prior permission. M.I.T. makes no representations about the suitability of this software for any purpose. It is provided as is without express or implied warranty.

Contents

Getting Help 3
The VRTSexplorer Diagnostic Program 4
Downloading VRTSexplorer from the Web 4
Installing VRTSexplorer from the VERITAS Software Disc 5
New Features 6
Storage Foundation QuickStart 6
Storage Foundation Standard 6
Storage Foundation Standard HA 6
Storage Foundation Enterprise 7
Feature Options 7
Storage Foundation Enterprise HA 7
Feature Options 8
Installing Storage Foundation 8
Component Product Licensing 8
VERITAS Licensing Commands 9
Upgrading from VxVM and VxFS to Storage Foundation 9
File Change Log (FCL) 9
Storage Foundation Product Suite 9
Storage Foundation QuickStart 10
Licensable Features 12
End of Product Support 13
Documentation 13
Documentation for Storage Foundation Products 13

Cluster Server Documentation 14
Volume Replicator Documentation 14
FlashSnap Agent For Symmetrix Documentation 14
FlashSnap Documentation 15
Quality of Storage Service Documentation 15
Component Product Release Notes 15

VERITAS Storage Foundation Products 1

This document provides release information on the five versions of the VERITAS Storage Foundation Release 4.0 Solaris product line:

- Storage Foundation QuickStart
- Storage Foundation Standard
- Storage Foundation Standard HA
- Storage Foundation Enterprise
- Storage Foundation Enterprise HA

All versions contain sets of VERITAS products that can be activated by a single license key, or features installed with the product packages and licensed separately.

The 4.0 release operates on the following Solaris operating systems:

Solaris 7 (32-bit and 64-bit)

Solaris 8 (32-bit and 64-bit)

Solaris 9 (32-bit and 64-bit)

Review this entire document before installing VERITAS Storage Foundation components. Also read the individual product release notes for important information, such as required patches and software issues, specific to those products (see "Component Product Release Notes" on page 15).

Topics in this guide include:

- Getting Help
- New Features
- Storage Foundation QuickStart
- Storage Foundation Standard
- Storage Foundation Standard HA
- Storage Foundation Enterprise

- Storage Foundation Enterprise HA
- Installing Storage Foundation
  - Component Product Licensing
  - VERITAS Licensing Commands
- Storage Foundation Product Suite
- Licensable Features
- End of Product Support
- Documentation
  - Documentation for Storage Foundation Products
  - Cluster Server Documentation
  - Volume Replicator Documentation
  - FlashSnap Documentation
  - FlashSnap Agent For Symmetrix Documentation
  - Quality of Storage Service Documentation
  - Component Product Release Notes

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: 1-925-931-2464
- Email: license@veritas.com
- Fax: 1-925-931-2487

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

The VRTSexplorer Diagnostic Program

The VRTSexplorer program is available to assist VERITAS Customer Support engineers in diagnosing technical problems associated with VERITAS products. You can download this program from the VERITAS FTP site or install it from a VERITAS software disc. For more information about the VRTSexplorer program, consult the README file located in the /support directory.

Downloading VRTSexplorer from the Web

1. Use a web browser or the ftp program to download the VRTSexplorer program from the following URL:

   ```
   ftp://ftp.veritas.com/pub/support/vxexplore.tar.Z
   ```

   Save the file to a temporary directory, such as /tmp, as shown in the example session below.

2. Log in as root on the system that is experiencing the problem. Extract the contents of the downloaded file to the directory /tmp/VRTSexplorer:

   ```
   # cd /tmp
   # zcat vxexplore.tar.Z | tar xvf -
   ```

3. Run the VRTSexplorer program located in the VRTSexplorer directory:

   ```
   # /tmp/VRTSexplorer/VRTSexplorer
   ```

4. When VRTSexplorer prompts for a destination directory for the information that it collects, press Return to accept the default directory /tmp, or enter an alternative path name of your own choice. VRTSexplorer writes the results of its analysis to a compressed tar file named VRTSexplorer_*casenumber_hostname*.tar.Z in the specified directory.

5. Use the file upload facility of your web browser, or the ftp program, to transfer the VRTSexplorer output file to the VERITAS Customer Support anonymous FTP site:

   ```
   ftp://ftp.veritas.com/incoming
   ```

6. Telephone VERITAS Technical Support at the number listed under "Getting Help" on page 3. Tell them that you have run VRTSexplorer and provide the name of the file that you transferred to the FTP site.

   Alternatively, if you have already been assigned a call ID number by Customer Support, send email to support@veritas.com and include your case ID number in the subject line.

Installing VRTSexplorer from the VERITAS Software Disc

The VRTSspt package is included on the VERITAS software discs under the /support directory. To load the software from a software disc:

1. Log in as superuser.

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

3. If Solaris volume management software is running on your system, when you insert the VERITAS software disc it is automatically mounted as /cdrom/cdrom0.

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

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

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

5. Move to the support directory and install the VRTSspt package:

   ```
   # cd /cdrom/cdrom0/support
   # pkgadd -d . VRTSspt
   ```

6. The program is installed in the /opt/VRTSspt directory and takes approximately 500 KB of disk space. To run the program, enter:.

   ```
   # /opt/VRTSspt/VRTSexplorer/VRTSexplorer
   ```

7. Use the file upload facility of your web browser, or the ftp program, to transfer the VRTSexplorer output file to the VERITAS Customer Support anonymous FTP site:

   ```
   ftp://ftp.veritas.com/incoming
   ```

8. Telephone VERITAS Customer Support at the number listed under “Getting Help” on page 3. Tell them that you have run VRTSexplorer and provide the name of the file that you transferred to the FTP site.

   Alternatively, if you have already been assigned a call ID number by Customer Support, send email to support@veritas.com and include your case ID number in the subject line.

9. To remove the VRTSspt package, enter:

   ```
   # pkgrm VRTSspt
   ```

New Features

The following new features are included with all versions of Storage Foundation:

- Dynamic LUN Expansion (with VxVM)
- Hardware assisted copy (with VxVM)
- Cross-platform Data Sharing (CDS) (with VxVM)
- File Change Log (with VxFS)
- Extra-Big File Systems (with VxFS)
- Multi-Volume Support (with VxFS)

Storage Foundation QuickStart

Storage Foundation QuickStart consists of the following products:

- VERITAS Volume Manager Lite - VxVM Lite
- VERITAS File System Lite - VxFS Lite

Storage Foundation Standard

Storage Foundation Standard consists of the following products:

- VERITAS Volume Manager (VxVM)
- VERITAS File System (VxFS)

The following feature is automatically licensed:

- VERITAS QuickLog

Storage Foundation Standard HA

Storage Foundation Standard consists of the following products:

- VERITAS Volume Manager (VxVM)
- VERITAS File System (VxFS)
- VERITAS Cluster Server (VCS)

The following feature is automatically licensed:

- VERITAS QuickLog

Storage Foundation Enterprise

Storage Foundation Enterprise consists of the following products and features:

- VERITAS Volume Manager (VxVM)
- VERITAS File System (VxFS)
- VERITAS FlashSnap
- Quality of Storage Service - with VxVM
- FlashSnap Agent for Symmetrix

The following feature is automatically licensed:

- VERITAS QuickLog

Feature Options

Storage Foundation Enterprise offers the following feature option:

- VERITAS Volume Replicator (VVR) - with VxVM

Storage Foundation Enterprise HA

Storage Foundation Enterprise HA consists of the following products and features:

- VERITAS Volume Manager - VxVM
- VERITAS File System - VxFS
- VERITAS Cluster Server (VCS)
- VERITAS FlashSnap
- Quality of Storage Service - with VxFS
- Global Cluster Option - with VCS
- FlashSnap Agent for Symmetrix

The following feature is automatically licensed:

- VERITAS QuickLog

Feature Options

Storage Foundation Enterprise HA offers the following feature option:

- VERITAS Volume Replicator (VVR) - with VxVM

Installing Storage Foundation

There are multiple software discs in the VERITAS product distribution. Storage Foundation and the VERITAS Cluster Server are on *VERITAS Storage Solutions 4.0 for Solaris* Disc 1.

The VERITAS software discs have an automated installation and licensing procedure that lets you install packages using an Installation Menu instead of installing from the command line. The *Getting Started Guide*, included with the VERITAS software discs, provides complete information on using the Installation Menu. Review the *Getting Started Guide* before installing any of the Storage Foundation products.

Component Product Licensing

A Storage Foundation QuickStart key licenses a limited version of VxVM (VxVM Lite) and VxFS (VxFS Lite).

A Storage Foundation Standard key licenses VxVM, VxFS, and QuickLog.

A Storage Foundation Standard HA keys licenses VxVM, VxFS, VCS, and QuickLog.

A Storage Foundation Enterprise key licenses VxFS, VxVM, VERITAS FlashSnap, FlashSnap Agent for Symmetrix, Quality of Storage Service, and the VERITAS QuickLog feature

A Storage Foundation Enterprise HA key license VxFS, VxVM, VCS, VERITAS FlashSnap, FlashSnap Agent for Symmetrix, Quality of Storage Service, Global Cluster option, and the VERITAS QuickLog feature.

When you install using the VERITAS Installation menu, the following information is displayed on the Product Status Page:

- Products available for installation
- Products currently installed
- Products that are licensed
- Options for operations you can initiate

Select option **L** to enter the license key. You will not have to re-enter the key for other licensed products.

Note Some features require a separate license key (see "Licensable Features" on page 12).

VERITAS Licensing Commands

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

`vxlicinst`—Installs a VERITAS license key.

`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 from VxVM and VxFS to Storage Foundation

If you already have a Storage Foundation or Storage Foundation Enterprise license, you can upgrade VxVM and VxFS using the installer script. See "Using the VERITAS Installation Menu" in the *Getting Started Guide* for more information.

File Change Log (FCL)

FCL is not supported on file systems with asymmetric permissions or if writable clones are present.

Caution File Change Log is currently nor supported. and VERITAS strongly cautions against using it in a production environment. Though FCL is not 100 percent complete, it can be used to begin developing new applications. FCL will be fully operational in the next VERITAS File System release. For more information, see TechNote 265313 available at: http://support.veritas.com/docs/265313.

Storage Foundation Product Suite

Storage Foundation QuickStart consists of VERITAS File System (Lite) and VERITAS Volume Manager (Lite).

Storage Foundation Standard consists of VERITAS File System and VERITAS Volume Manager. A Storage Foundation key licenses VxFS, VxVM, and the VERITAS QuickLog feature.

Storage Foundation Standard HA consists of VERITAS File System, VERITAS Volume Manager, and VERITAS Cluster Server. A Storage Foundation HA key licenses VxFS, VxVM, VCS, and the VERITAS QuickLog feature.

Storage Foundation Enterprise consists of VERITAS File System, VERITAS Volume Manager, VERITAS FlashSnap, FlashSnap Agent for Symmetrix, and Quality of Storage Service. A Storage Foundation Enterprise key licenses VxFS, VxVM, VERITAS FlashSnap, FlashSnap Agent for Symmetrix, Quality of Storage Service, and the VERITAS QuickLog feature. VVR is available as an option.

Storage Foundation Enterprise HA consists of VERITAS File System, VERITAS Volume Manager, VERITAS Cluster Server, VERITAS FlashSnap, FlashSnap Agent for Symmetrix, Quality of Storage Service, and Global Cluster option. A Storage Foundation HA key licenses VxFS, VxVM, VCS, VERITAS FlashSnap, FlashSnap Agent for Symmetrix, Quality of Storage Service, Global Cluster option, and the VERITAS QuickLog feature. VVR is available as an option.

VxFS is a quick-recovery, journaling file system that provides high performance and online management capabilities.

VxVM is a storage management tool that manages physical disks as logical device volumes, removing the limitations of physical disk storage partitions.

The QuickLog feature enhances file system performance for metadata intensive applications such as mail serving. Although QuickLog can improve file system performance, VxFS does not require QuickLog to operate effectively.

Storage Foundation QuickStart

Storage Foundation QuickStart is a limited feature set of VERITAS File System and VERITAS Volume Manager functionality. Storage Foundation QuickStart provides high performance and data integrity for environments with less stringent availability and management requirements. Storage Foundation QuickStart uses the same binaries as other Storage Foundation products, so upgrading to the full functionality of VERITAS Storage Foundation requires only the installation of a Storage Foundation license key—no product installation or reboot is needed. To enable Storage Foundation options, such as FlashSnap, VVR, and Quality of Storage Service, you must first upgrade to VERITAS Storage Foundation Standard or VERITAS Storage Foundation Enterprise.

The following features are available in Storage Foundation, but are not included with Storage Foundation QuickStart.

VERITAS Base File System Features (not available with Storage Foundation QuickStart)

- Online file system resize
- Online file system defragment
- Online disk layout upgrade
- Snapshot file systems
- Group quotas
- Forced unmount
- DMAPI (Data Management API, used with hierarchical storage management (HSM)
- Space reservation and setting extent sizes
- Caching advisories
- The `mount` command options remount, mincache and convosync (including direct and Discovered Direct I/O, and I/O error handling
- Storage checkpoints (Storage Foundation Enterprise and Storage Foundation Enterprise HA only)
- Quicklog
- Multi-device support
- Support for file systems greater than 2 TB and not greater than 32 TB
- Support for file systems greater than 32 TB (Storage Foundation Enterprise and Storage Foundation Enterprise HA only)
- Online intent log resize
- File change log
- Portable file systems

VERITAS Base Volume Manager Features (not available in Storage Foundation QuickStart)

- Striping
- Mirroring of user-data disks (QuickStart does include root mirroring)
- Striping + mirroring (RAID 0+1)
- Mirrored stripes (RAID 1+0)
- RAID-5
- RAID-5 with logging

- Log-based mirror recovery (dirty region logging)
- SmartSync (Oracle resilvering)
- Hot-sparing / hot relocation
- Dynamic multipathing (DMP)
- Online data migration
- Snapshots
- Task monitoring
- Online relayout
- Storage Expert
- SCS III PGR
- Import volumes from host with different OS
- VxMS plugin
- Volume sets
- Fast MIrror Resynchronization (Storage Foundation Enterprise and Storage Foundation Enterprise HA only)
- Disk group split / join (Storage Foundation Enterprise and Storage Foundation Enterprise HA only)
- Attribute-based allocation
- Dynamic LUN expansion
- Ecopy

Licensable Features

VERITAS Volume Replicator (VVR) is a data-replication software designed to contribute to an effective disaster recovery plan by maintaining an exact or consistent copy of application data at one or more remote locations.

VVR is installed with Storage Foundation Standard Enterprise and Storage Foundation Enterprise HA, but require a separate product license key.

End of Product Support

This is the last release to support the QuickLog statistic gathering functionality provided by the `qlogstat` command. Also, future releases of QuickLog will support only one VxFS file system per QuickLog device instead of the current 32 file systems per QuickLog device.

Documentation

Release Notes and Installation guides related to the VERITAS Storage Foundation are available on the *VERITAS Storage Solutions* Disc 1 under the `storage_foundation` directory. All other documents are on the *VERITAS Storage Solutions* Disc 3 under the `storage_foundation` directory.

After the installation procedure is complete, documents are available online under the `/opt/VRTS`*`package_name`*`/doc` directories. Documents are provided as Adobe Portable Document Format (PDF) files. To view or print PDF documents, you must have the Adobe Acrobat Reader installed.

Documentation for Storage Foundation Products

The following documentation is available with Storage Foundation Standard, Storage Foundation Standard HA, Storage Foundation Enterprise, Storage Foundation Enterprise HA:

`The VRTSfsdoc package contains the following` VERITAS File System documentation:

VERITAS File System Installation Guide (includes QuickLog information) (`vxfs_ig.pdf`)

VERITAS File System Administratrator's Guide (`vxfs_ag.pdf`)

`The VRTSvmdoc package` contains the following VERITAS Volume Manager documentation:

VERITAS Volume Manager Installation Guide (`vxvm_ig.pdf`*)*

VERITAS Volume Manager Administratrator's Guide (`vxvm_ag.pdf`)

VERITAS Volume Manager User's Guide – VERITAS Enterprise Administrator (`vxvm_ug.pdf`)

VERITAS FlashSnap Point-In-Time Copy Solutions Administrator's Guide (`pitc_ag.pdf`)

VERITAS Volume Manager Troubleshooting Guide (`vxvm_tshoot.pdf`)

VERITAS Volume Manager Hardware Notes(vxvm_hwnotes.pdf)

VERITAS Volume Manager Intelligent Storage Provisioning Administrator's Guide (vxvm_ispag.pdf)

VERITAS Volume Manager Cross-platform Data Sharing Administrator's Guide (vxvm_cdsag.pdf)

Cluster Server Documentation

The VRTSvcsdc package contains the Cluster Server documentation. The following documentation is available only with Storage Foundation Standard HA, Storage Foundation Enterprise HA, and Storage Foundation QuickStart HA:

VERITAS Cluster Server User's Guide (vcs_ug.pdf)

VERITAS Cluster Server Installation Guide (vcs_ig.pdf)

VERITAS Cluster Server Bundled Agents Reference Guide (vcs_barg.pdf)

VERITAS Cluster Server Agent Developer's Guide (vcs_agd.pdf)

VERITAS Cluster Server Application Note: Sun Fire 12K/15K Dynamic Reconfiguration (vcs_appnote_f15kdr.pdf)

VERITAS Cluster Server Application Note: Sun StorEdge 6800 Dynamic Reconfiguration (vcs_appnote_s6800dr.pdf)

VERITAS Cluster Server Application Note: Sun Enterprise 10000 Dynamic Reconfiguration (vcs_appnote_e10kdr.pdf)

Volume Replicator Documentation

The VRTSvrdoc package contains the following VERITAS Volume Replicator documentation:

Volume Replicator Installation Guide (vvr_ig.pdf)

Volume Replicator Administrator's Guide (vvr_ag.pdf)

Volume Replicator Configuration Notes (vvr_config.pdf)

*Volume Replicator Web Console Administrator's Guide (*vrw_ag.pdf)

*Volume Cluster Server Agents for VERITAS Volume Replicator (*vcsvvr_icg.pdf)

FlashSnap Agent For Symmetrix Documentation

VERITAS FlashSnap Agent for Symmetrix 4.0 Adminstrator's Guide (vxfas_ag.pdf)

*VERITAS FlashSnap Agent for Symmetrix 4.0 Installation Guide (*vxfas_ig.pdf)

VERITAS Cluster Server Agents for Veritas Flashsnap Agent for Symmetrix 4.0 Installation and Configuration Guide (vxfas_vcsagent.pdf)

VERITAS FlashSnap Agent for Symmetrix 4.0 Release Notes (vxfas_notes.pdf)

FlashSnap Documentation

VERITAS FlashSnap Point-In-Time Copy Solutions Administrator's Guide (pitc_ag.pdf)

Quality of Storage Service Documentation

VERITAS File System Administratrator's Guide (vxfs_ag.pdf)

Component Product Release Notes

Release notes for component products in all versions of the VERITAS Storage Foundation are located under the storage_foundation/release_notes directory of the VERITAS Storage Foundation disc or the cluster_server/release_notes directory of the VERITAS Cluster Server disc. It is important that you read the relevant component product release notes before installing any version of VERITAS Storage Foundation:

VERITAS File System Release Notes (vxfs_notes.pdf)

VERITAS Volume Manager Release Notes (vxvm_notes.pdf)

VERITAS Volume Replicator Release Notes (vvr_notes.pdf)

VERITAS Cluster Server Release Notes (vcs_notes.pdf)

Because product release notes are not installed by any packages, VERITAS recommends that you copy them to the /opt/VRTS*product_name*/doc directory after the product installation so that they are available for future reference.