

Veritas Storage Foundation™ Release Notes

AIX

5.1



Veritas Storage Foundation Release Notes

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Product version: 5.1

Document version: 5.1.2

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Symantec's maintenance offerings include the following:

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www.symantec.com/business/support/index.jsp

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www.symantec.com/business/support/contact_techsupp_static.jsp

Before contacting Technical Support, make sure you have satisfied the system requirements that are listed in your product documentation. Also, you should be at the computer on which the problem occurred, in case it is necessary to replicate the problem.

When you contact Technical Support, please have the following information available:

- Product release level
- Hardware information
- Available memory, disk space, and NIC information
- Operating system

- Version and patch level
- Network topology
- Router, gateway, and IP address information
- Problem description:
 - Error messages and log files
 - Troubleshooting that was performed before contacting Symantec
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customercare.symantec.com

Customer service

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www.symantec.com/customercare

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- Latest information about product updates and upgrades
- Information about upgrade assurance and maintenance contracts
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- Advice about Symantec's technical support options
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If you want to contact Symantec regarding an existing maintenance agreement, please contact the maintenance agreement administration team for your region as follows:

Asia-Pacific and Japan	customercare_apac@symantec.com
Europe, Middle-East, and Africa	semea@symantec.com
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To access more information about Enterprise services, please visit our Web site at the following URL:

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Select your country or language from the site index.

Storage Foundation Release Notes

This document includes the following topics:

- [Overview of this release](#)
- [Changes in Storage Foundation](#)
- [Storage Foundation for Databases supported features](#)
- [System requirements](#)
- [Component product release notes](#)
- [Software limitations](#)
- [Fixed issues](#)
- [Known issues](#)
- [No longer supported](#)
- [Documentation](#)

Overview of this release

Before you continue, make sure that you are using the current version of this guide. It is online at:

http://sfdoccentral.symantec.com/sf/5.1/aix/sf_notes.pdf

This document is Document version: 5.1.2.

This document provides release information about the products in the Veritas Storage Foundation 5.1 product line:

- Veritas Storage Foundation™ (Basic, Standard, Standard HA, Enterprise, and Enterprise HA)
- Veritas™ Volume Manager (VxVM)
- Veritas™ File System (VxFS)
- Veritas Storage Foundation™ Cluster File System (SFCFS)

See the *Veritas Storage Foundation Installation Guide*.

For the latest patches available for this release, go to: <http://vos.symantec.com/>.

For important updates regarding this release, review the Late-Breaking News TechNote on the Symantec Technical Support website:

<http://entsupport.symantec.com/docs/334998>

The hardware compatibility list (HCL) contains information about supported hardware and is updated regularly. For the latest information on supported hardware visit the following URL:

<http://entsupport.symantec.com/docs/330441>

Before installing or upgrading Storage Foundation and High Availability Solutions products, review the current compatibility list to confirm the compatibility of your hardware and software.

Review this entire document before installing your Veritas Storage Foundation product.

This document does not contain release information for Veritas Cluster Server.

See the *Veritas Cluster Server Release Notes*.

Veritas Operation Services

Veritas Operations Services (VOS) is a Web-based application that is designed specifically for Veritas Storage Foundation and High Availability products. VOS increases operational efficiency and helps improve application availability.

Among its broad set of features, VOS evaluates the systems in your environment to determine if you are ready to install or upgrade Storage Foundation and High Availability products.

To access VOS, go to:

<http://go.symantec.com/vos>

Changes in Storage Foundation

This section describes the changes in Veritas Storage Foundation 5.1.

Installation and upgrade

Storage Foundation installation and upgrade includes the following changes in 5.1:

Veritas keyless licensing

This release of the Veritas products introduces the option to install without a license key. A license key is used during the installation of a software to identify that the user has the right to use the software. Previous releases of Veritas products required that you obtain a license key prior to installation. The installer required that you enter a valid license key before the Veritas software was installed.

The keyless license strategy does not eliminate the need to obtain a license. A software license is a legal instrument governing the usage or redistribution of copyright protected software. The administrator and company representatives must ensure that a server or cluster is entitled to the license level for the products installed. Symantec reserves the right to ensure entitlement and compliance through auditing.

In this release of the Veritas products, the product installer does not require that you enter a license key. The installer prompts you to select one of the following licensing methods:

- Install a license key for the product and features that you want to install.
- Continue to install without a license key.
 - The installer prompts for the product modes and options that you want to install, and then sets the required product level.
 - Within 60 days of choosing this option, you must install a valid license key corresponding to the license level entitled or continue with keyless licensing by managing the server or cluster with a management server. If you do not comply with the above terms, continuing to use the Veritas product is a violation of your end user license agreement, and results in warning messages.
 - For more information about keyless licensing, see the following URL:
<http://go.symantec.com/sfhakeyless>

If you upgrade to this release from a prior release of the Veritas software, the product installer does not change the license keys that are already installed. The existing license keys may not activate new features in this release.

If you upgrade with the product installer, or if you install or upgrade with a method other than the product installer, you must do one of the following to license the products:

- Run the `vxkeyless` command to set the product level for the products you have purchased. This option also requires that you manage the server or cluster with a management server.
- Use the `vxlicinst` command to install a valid product license key for the 5.1 products you have purchased.

You can also use the above options to change the product levels to another level that you are authorized to use.

Symantec recommends updating to keyless licensing for the following reasons:

- it enables 5.1 functionality.
- it allows you to change the product level easily.

For information about setting or changing the product level, see the Installation Guide for your Veritas product.

See the `vxkeyless(1m)` manual page.

Packaging updates

[Table 1-1](#) lists the updates related to packages for this release.

Table 1-1 List of packages

5.0 Package Name	5.1 Package name	Explanation of changes	Package description
N/A	VRTScps	New package.	Veritas Cluster Server Coordination Point Server
N/A	VRTSvcsea	New package.	Veritas Cluster Server Enterprise Agents
N/A	VRTSsfmh	New package.	Veritas Storage Foundation Managed Host
N/A	VRTSaslapm	New package.	Volume Manager ASL/APM
SYMClma	N/A	Obsolete in 5.0MP3. Functionality dropped.	Symantec License Inventory Agent
VRTSaa	VRTSsfmh	Consolidated into VRTSsfmh.	Veritas Enterprise Administrator action agent

Table 1-1 List of packages (*continued*)

5.0 Package Name	5.1 Package name	Explanation of changes	Package description
VRTSaclib	N/A	Obsolete in 5.1. Not available for fresh installation. Only available to upgrade customers.	Veritas Cluster Server ACC Library 5.0 by Symantec
VRTSalloc	N/A	Obsolete in 5.1. Functionality dropped.	Veritas Storage Foundation Intelligent Storage Provisioning
VRTSat	VRTSat	No change.	Symantec Product Authentication Service
VRTScavf	VRTScavf	No change.	Veritas Cluster Server Agents for Storage Foundation Cluster File System
VRTSccg	VRTSsfmh	Consolidated into VRTSsfmh.	Veritas Enterprise Administrator Central Control Grid
VRTScfsdc	N/A	Obsolete in 5.0MP3. Documentation available in DVD media as PDFs.	Veritas Cluster File System Documentation
VRTScmccc	N/A	Obsolete in 5.1. Delivered with 5.x CMC release.	Veritas Cluster Management Console Cluster Connector
VRTScmcdc	N/A	Obsolete in 5.0MP3. Delivered with 5.x CMC release.	User Documentation for Veritas Cluster Management Console
VRTScmcm	N/A	Obsolete in 5.0MP3. Delivered with 5.x CMC release.	Veritas Cluster Management Console for multicluster environments
VRTScmcs	N/A	Obsolete in 5.1. Delivered with 5.x CMC release.	Veritas Cluster Management Console for single cluster environments
VRTScs	N/A	Obsolete in 5.0MP3. Delivered with SFM release.	Veritas Centralized Management for Storage Foundation Management Server

Table 1-1 List of packages (*continued*)

5.0 Package Name	5.1 Package name	Explanation of changes	Package description
VRTScscm	N/A	Obsolete in 5.1. Available for download from http://go.symantec.com/vcsmc	Veritas Cluster Server Cluster Manager
VRTScscw	N/A	Obsolete in 5.1.	Veritas Cluster Server Configuration Wizards
VRTScsdoc	N/A	Obsolete in 5.0MP3. Delivered with SFM release.	Veritas Enterprise Administrator Central Server Documentation
VRTScsocw	N/A	Obsolete in 5.1.	Veritas Cluster Server Oracle and RAC Configuration Wizards
VRTScssim	N/A	Obsolete in 5.1. Available for download from http://go.symantec.com/vcsmc .	Veritas Cluster Server Simulator
VRTScutil	VRTScutil	Expanded to include few VCS packages.	Veritas Cluster Utility
VRTScweb	N/A	Obsolete in 5.0MP3. Delieverd with SFM release.	Veritas Enterprise Administrator Central Server Documentation
VRTSd2gui	N/A	Obsolete in 5.1. Functionality dropped.	Veritas Storage Foundation Graphical User Interface for DB2
VRTSdb2ed	N/A	Obsolete in 5.1. Functionality dropped.	Veritas Storage Foundation for DB2
VRTSdbac	VRTSdbac	No change.	Veritas Oracle Real Application Cluster Support Package
VRTSdbcom	VRTSdbed	Consolidated into VRTSdbed.	Veritas Storage Foundation Common Utilities for Databases
VRTSdbdoc	N/A	Obsolete in 5.0MP3. Documentation available in DVD media as PDFs.	Veritas Storage Foundation Documentation for Databases

Table 1-1 List of packages (*continued*)

5.0 Package Name	5.1 Package name	Explanation of changes	Package description
VRTSdbed	VRTSdbed	Expanded to include DBED packages.	Veritas Storage Foundation for Oracle
VRTSdbms3	N/A	Obsolete in 5.1. Sybase ASA repository no longer used in 5.1.	Symantec Shared DBMS
VRTSdcli	N/A	Obsolete in 5.1.	Veritas Distributed Command Line Interface
VRTSdcp	N/A	Obsolete in 5.0MP3. Delieverd with SFM release.	Veritas Disk Correlator Provider
VRTSddlpr	N/A	Obsolete in 5.1. Functionality merged into VRTSob.	Veritas Device Discovery Layer Services Provider
VRTSdsa	N/A	Obsolete in 5.1. Functionality dropped.	Veritas Datacenter Storage Agent
VRTSdsm	N/A	Obsolete in 5.0MP3. Delieverd with SFM release.	Veritas Datacenter Storage Manager
VRTSfas	N/A	Obsolete in 5.0MP3. Functionality dropped.	Veritas FlashSnap Agent for Symmetrix
VRTSfasag	N/A	Obsolete in 5.0MP3. Functionality dropped.	Veritas Cluster Server Agents for Veritas FlashSnap Agent for Symmetrix
VRTSfasdc	N/A	Obsolete in 5.0MP3. Functionality dropped.	Veritas FlashSnap Agent for Symmetrix Documentation
VRTSfsdoc	N/A	Obsolete in 5.0MP3. Documentation available in DVD media as PDFs.	Veritas File System Documentation
VRTSfsman	VRTSvxfs	Consolidated into VRTSvxfs.	Veritas File System - Manual Pages
VRTSfsmnd	VRTSfssdk	Consolidated into VRTSfssdk.	Veritas File System SDK - Manual Pages

Table 1-1 List of packages (*continued*)

5.0 Package Name	5.1 Package name	Explanation of changes	Package description
VRTSfspro	VRTSob	Consolidated into VRTSob.	Veritas File System Management Services Provider
VRTSfssdk	VRTSfssdk	No change.	Veritas File System SDK
VRTSfsweb	N/A	Obsolete in 5.0MP3. Delieverd with SFM release.	Veritas File System Provider Web Client Extension
VRTSgab	VRTSgab	No change.	Veritas Group Membership and Atomic Broadcast
VRTSgapms	N/A	Obsolete in 5.0MP3. Delieverd with SFM release.	Veritas Generic Array Plug-in for Mapping Services
VRTSgcscha	N/A	Obsolete in 5.0MP3. Delieverd with SFM release.	Veritas GCS high availability agents
VRTSgcspr	N/A	Obsolete in 5.0MP3. Delieverd with SFM release.	Veritas SAN Global Configuration Server Object Bus Provider
VRTSglm	VRTSglm	No change.	Veritas Global Lock Manager
VRTSgms	VRTSgms	No change.	Veritas Group Messaging Services
VRTSsisco	N/A	Obsolete in 5.1.	Symantec Infrastructure Core Services Common
VRTSjre	N/A	Obsolete in 5.0MP3.	Veritas Java Runtime Environment Redistribution
VRTSjre15	N/A	Obsolete in 5.1.	Symantec Java Runtime Environment Redistribution
VRTSllt	VRTSllt	No change.	Veritas Low Latency Transport
VRTSmapro	N/A	Consolidated into VRTSob.	Veritas Storage Mapping Provider

Table 1-1 List of packages (*continued*)

5.0 Package Name	5.1 Package name	Explanation of changes	Package description
VRTSmh	VRTSsfmh	Consolidated into VRTSsfmh.	Veritas Storage Foundation Management host
VRTSob	VRTSob	No change.	Veritas Enterprise Administrator Service
VRTSobc33	N/A	Obsolete in 5.1. Functionality Delivered with SFM release	Veritas Enterprise Administrator Core
VRTSobgui	N/A	Obsolete in 5.1. Functionality Delivered with SFM release.	Veritas Enterprise Administrator
VRTSobweb	N/A	Obsolete in 5.1. Functionality Delivered with SFM release.	Veritas Enterprise Administrator Web Console
VRTSodm	VRTSodm	No change	Veritas Oracle Disk Manager
VRTSorgui	N/A	Obsolete in 5.1. No longer supported.	Veritas Storage Foundation Graphical User Interface for Oracle
VRTSpbx	N/A	Obsolete in 5.1.	Symantec Private Branch Exchange
VRTSperl	VRTSperl	No change.	Veritas Perl 5.8.8 redistribution
VRTSsmf	N/A	Obsolete in 5.0MP3.	Symantec Service Management Framework
VRTSspt	VRTSspt	No change.	Veritas Software Support Tools
VRTSsybed	N/A	Obsolete in 5.1. Functionality dropped.	Veritas Storage Foundation for Sybase
VRTSvail	N/A	Obsolete in 5.1. Functionality Delivered with SFM release.	Veritas Array Providers
VRTSvc	VRTSvc	Expanded to include few VCS packages.	Veritas Cluster Server

Table 1-1 List of packages (*continued*)

5.0 Package Name	5.1 Package name	Explanation of changes	Package description
VRTSvcstag	VRTSvcstag	Expanded to include agents previously included in VRTSvcsvr.	Veritas Cluster Server Bundled Agents
VRTSvcfdb	VRTSvcsea	Consolidated into VRTSvcsea.	Veritas High Availability Agent for DB2
VRTSvcfdc	N/A	Obsolete in 5.0MP3. Documentation available in DVD media as PDFs.	User Documentation for Veritas Cluster Server
VRTSvcsmg	VRTSvc	Consolidated into VRTSvc.	Veritas Cluster Server English Message Catalogs
VRTSvcsmn	VRTSvc	Consolidated into VRTSvc.	Manual Pages for Veritas Cluster Server
VRTSvcSOR	VRTSvcsea	Consolidated into VRTSvcsea.	Veritas High Availability Agent for Oracle
VRTSvcSSy	VRTSvcsea	Consolidated into VRTSvcsea.	Veritas High Availability Agent for Sybase
VRTSvcsvr	VRTSvcstag	Consolidated into VRTSvcstag.	Veritas Cluster Server Agents for Veritas Volume Replicator
VRTSvdid	N/A	Obsolete in 5.1.	Veritas Device Identification API
VRTSveki	VRTSveki	No change.	Veritas Kernel Interface
VRTSvlic	VRTSvlic	No change.	Symantec License Utilities
VRTSvmdoc	N/A	Obsolete in 5.0MP3. Documentation available in DVD media as PDFs.	User Documentation for Veritas Volume Manager
VRTSvmman	VRTSvxvm	Consolidated into VRTSvxvm.	Manual Pages for Veritas Volume Manager
VRTSvmpro	N/A	Consolidated into VRTSob.	Veritas Volume Manager Management Services Provider

Table 1-1 List of packages (*continued*)

5.0 Package Name	5.1 Package name	Explanation of changes	Package description
VRTSvmweb	N/A	Obsolete in 5.0MP3. Delivered with SFM release.	Veritas Volume Manager Management Services Web Client Extensions
VRTSvrdoc	N/A	Obsolete in 5.0MP3. Documentation available in DVD media as PDFs.	User Documentation for Veritas Volume Replicator
VRTSvrpro	N/A	Consolidated into VRTSob.	Veritas Volume Replicator Management Services Provider
VRTSvrw	N/A	Obsolete in 5.1. Delivered with SFM release.	Veritas Volume Replicator Web Console
VRTSsvsc	N/A	Obsolete in 5.0MP3.	Veritas Volume Server and Client Provider
VRTSvxfen	VRTSvxfen	No change.	Veritas I/O Fencing
VRTSvxfs	VRTSvxfs	Expanded to include VRTSfsman (man pages). On Linux: VRTSvxfs-common and VRTSvxfs-platform packages are consolidated into single VRTSvxfs package.	Veritas File System
VRTSvxmsa	N/A	Obsolete in 5.1. Functionality dropped.	Veritas VxMS Mapping Service, Application Libraries
VRTSvxvm	VRTSvxvm	Expanded to include VRTSvxman (man pages). On Linux: VRTSvxvm-common and VRTSvxvm-platform packages are consolidated into single VRTSvxvm package.	Veritas Volume Manager binaries
VRTSweb	N/A	Obsolete in 5.1.	Symantec Web Server

Install options for Storage Foundation High Availability and the Storage Foundation Cluster File System High Availability

The product installation programs now prompt you for whether you want to install the high availability packages when you are installing Storage Foundation or Storage Foundation Cluster File System. This change enables you to explicitly choose which functionality is installed. In previous releases, the installed license key determined what functionality was installed.

The product installer displays Storage Foundation High Availability and Storage Foundation Cluster File System High Availability on the product selection menu.

Improved response file generation

You can now create response files without performing a live installation, using the installation simulator.

Option to install only the minimal packages

The product installer now provides several options for which packages to install. For each product, you can install the minimal packages, the recommended packages or all of the packages.

When you install with the product installer, you can select from one of the following install options:

- Minimal filesets: installs only the basic functionality for the selected product.
- Recommended filesets: installs the full feature set without optional filesets.
- All filesets: installs all available filesets.

When you install with a product install script, such as `installsf`, you can use the following options to the install script:

- `-minpkgs`: displays the filesets and patches required for basic functionality.
- `-recpkgs`: displays the recommended filesets and patches.
- `-allpkgs`: displays all available filesets and patches.

Veritas extension for Oracle Disk Manager fileset is installed by default for Storage Foundation and Storage Foundation Cluster File System

The Veritas extension for Oracle Disk Manager package is supported with a Storage Foundation license.

In this release, the product installer now installs the required fileset for ODM by default when Storage Foundation is installed.

For Storage Foundation Cluster File System, the GMS `VRTSgms.bff` fileset is also installed.

Storage Foundation support with NPIV technology

Storage Foundation now supports the AIX VIO environment where VIOS is configured with NPIV capable FC adapters connected to a NPIV capable SAN (SAN switch that is NPIV capable).

The HCL support is identical to dedicated HBAs to LPARs/micro-partitions. For storage arrays which include features such as SCSI-3 or active/active multi-pathing, when attached through the VIO Server this functionality is available for storage provisioned with NPIV.

This release of Storage Foundation also provides DMP support for booting off (rootvg) NPIV devices. Devices in VIO client appear as regular SCSI disks, so Storage Foundation identifies these LUNs based on the array properties where LUNs are provisioned from. This functionality enables Storage Foundation (specifically, DMP) to treat these devices like any regular SAN storage array LUNs. In the legacy VIO environment, with NPIV, Storage Foundation would claim the devices as vSCSI LUNs. With NPIV, the VIO client environment is transparent to Storage Foundation and all the Storage Foundation commands behave the same way as they would in a regular physical AIX server.

This functionality is supported for both Storage Foundation and Storage Foundation High Availability.

Option to create response file templates

You can use the `-makeresponsefile` option of the installer to create response file templates.

The installer also generates a response file after each successful installer task, such as installation, configuration, uninstallation, or upgrade. These response files contain the details that you provided to the installer questions in the form of values for the response file variables. The response file also contains descriptions and explanations of the variables and their values.

See the *Veritas Storage Foundation and High Availability Installation Guide*.

Option to start or stop Storage Foundation HA

After the installation and configuration is complete, the installer starts the processes that the installed products use. You can use the product installer to stop or start the processes and load or unload the drivers, if required.

See the *Veritas Storage Foundation and High Availability Installation Guide* for more details.

Support for installer resilience

If an installation or upgrade of Storage Foundation is interrupted, the next time you re-run it the installer discovers the presence of an installer instance. The installer then gives an option to resume the installation or upgrade.

See the *Veritas Storage Foundation and High Availability Installation Guide* for more details.

Installation options for NIM

The installer program can generate sample finish or configuration scripts that integrate with native installation tools. These sample scripts include all of the relevant Symantec packages in the correct order for installation. This feature is supported for installations, not upgrades.

Installer does not proceed with installation in RSH/SSH disabled environments

In the previous releases of Storage Foundation, in certain secure enterprise environments where RSH or SSH communication was not enabled, the installer installed and configured Storage Foundation only on the local system and the systems with which it could communicate. The installer also generated a response file that you could copy to the other systems in the cluster to identically install and configure Storage Foundation on other systems.

With this release of Storage Foundation, the installer mandates the availability of either RSH or SSH communication between the systems to perform any installer task.

Support for Web-based installer

This release supports an interactive installation using the Web-based installer. You can use a Web-interface to install and configure Storage Foundation HA.

The Web-installer can perform the following functions:

- Install Storage Foundation HA
- Uninstall Storage Foundation HA
- Configure Storage Foundation HA
- Upgrade Storage Foundation HA

- Start and stop Storage Foundation HA
- Perform an installation precheck

The installer program's default answer is no to configure optional features

The installer's default answer to configure optional features is now no. You must enter **y** if you want to configure certain optional features.

Gathering requirements using the installer program

You can use the `-requirements` option of the installer to gather the installation requirements. Web-based installer also provides you with a similar option.

The following information is displayed:

- Required operating system level
- Required patches
- Required disk space
- Other requirements

Support to continue installation after a successful precheck

The installer program has more sophisticated precheck, installation, and configuration options, which follow in outline:

- When you perform a successful precheck, you have the option to continue with the installation.
- After a successful installation, you have the option to continue with the configuration, or you can return to the configuration later.

Selecting default systems for installation

From the local system, the installer program checks for the `/etc/llhosts` for node names. When found, the installer program presents these as default nodes for installation. If the `llhosts` file is not present, then no default node names are provided.

Communication modes

By default, the installer program uses SSH for communication. The installer program switches to RSH if password-less SSH is not enabled.

For RSH communication, the `-rsh` option is available.

The installer programs supports mixed RSH and SSH modes on nodes in a cluster. The installation program can install on systems which may have heterogeneous (RSH and/or SSH) communication modes enabled.

IPv6 support for the installer programs

You can now use the installer to install and configure Storage Foundation HA on systems with IPv4, IPv6, or mixed stack configurations.

The following limitations apply:

- RSH is not supported on AIX
- SSH on AIX requires that you enable sshd.

Adding a node using the -addnode option

The `-addnode` option has been added to the installer to add a node to a running cluster. Based on the existing cluster configuration, the installer also configures the new node to use Symantec Product Authentication service and to use I/O fencing.

The installer also supports adding a node to a single node cluster, but stops the cluster during the addition of the node.

Installer support for alternate boot disk

The installer program supports install, uninstallation, and upgrades on alternate boot disks for AIX.

Refer to the *Veritas Storage Foundation and High Availability Installation Guide*.

Silent and automated installation enhancements for response files

The installer program supports silent installations using response files.

Operations that you can perform using response files follow:

- Fresh installations
- Configurations
- Uninstallations
- Upgrades from previous supported releases

Command options to help troubleshoot installations

You can run the installer with the `-debug` option and the `-trace` option to troubleshoot an installation.

Supported paths for Storage Foundation upgrades that do not require a system reboot

When you perform a typical upgrade using the installer program from Storage Foundation or Storage Foundation High Availability version 5.0 MP3 to version 5.1, a system reboot is not required.

Upgrades that follow any other upgrade paths require a reboot.

Changes related to the installer for cross-product upgrades

This release includes the following changes related to the cross-product upgrades:

- If you try to perform a cross-product upgrade, the installer now gracefully exits with an error message.
For example, if you choose to upgrade SFHA 5.0 MP3 to SFCFS 5.1, the installer displays the following error message:

```
SFHA 5.0.30.00 is installed.  
Upgrading SFHA 5.0.30.00 directly to SFCFS 5.1 is not supported.
```

The installer does not support a direct upgrade from a previous SF or SFHA version to SFCFS or SF Oracle RAC version 5.1. You must upgrade SF or SFHA to version 5.1, and then install the 5.1 version of the stack product.

See the appropriate product Installation Guides for upgrade instructions.

- If a previous version of SFHA is installed, the installer supports partial product upgrade.
You can upgrade only VCS or SF to version 5.1. For example, you can upgrade SFHA 5.0 MP3 to SF 5.1. If you want to upgrade the complete SFHA stack later, you can run the `installvcs` program.

See the *Veritas Storage Foundation High Availability Installation Guide* for supported upgrade paths.

Storage Foundation

Storage Foundation includes the following changes in 5.1:

Veritas Enterprise Administrator Graphical User Interface

The Veritas Enterprise Administrator (VEA) console is no longer packaged with Storage Foundation products. Symantec recommends use of Storage Foundation Manager to manage, monitor and report on Storage Foundation product environments. You can download this utility at no charge at <http://go.symantec.com/vom>. If you wish to continue using VEA, a version is available for download from <http://go.symantec.com/vom>.

Changes to Storage Foundation for Databases (SFDB) functionality

The Storage Foundation for Databases (SFDB) feature for enhanced management of Oracle databases is included with Enterprise licensing for Storage Foundation and Storage Foundation HA. The SFDB tools provide enhanced ease-of-use commands which can be run by a database administrator without root privilege to optimize storage for an Oracle database environment. This extended functionality is supported for configurations with single instance Oracle and includes the following:

- Database Checkpoints
- Database FlashSnap
- Database Cloning
- Database Dynamic Storage Tiering

For information on using SFDB tools, see the *Veritas Storage Foundation: Storage and Availability Management for Oracle Databases* guide.

SFDB new features

New features in the Storage Foundation for Databases tools package for database storage management for release 5.1:

- SQLite repository
- Multiple disk group support for FlashSnap
- Mapped mount points for individual volumes for Database Flashsnap clones
- Oracle Dataguard support
- Oracle Enterprise Manager (OEM) Plugin
- Cached ODM support

SFDB feature changes

If you are upgrading from Storage Foundation for Oracle (HA) 4.x or 5.0 to Storage Foundation 5.1, the following changes in functionality will apply.

Commands which have changed:

- `sfua_db_config` functionality is changed: this command is no longer needed to create a SFDB repository. The functionality of `sfua_db_config` is now used to set user and group access to various SFDB directories.
- Use the `dbed_update` command to create a new SQLite SFDB repository.
- `sfua_rept_adm` was used in release 5.0 to perform repository backup and restore and this command will be obsolete in release 5.1.
- The `sfua_rept_util` command is used to perform SQLite repository backup and restore.
- The `sfua_rept_migrate` command is added for migrating the SFDB repository from the 4.x or 5.0 release to the 5.1 release.

Commands which continue to be supported:

- `dbed_update`
- Database Storage Checkpoint commands: `dbed_ckptcreate`, `dbed_ckptdisplay`, `dbed_ckptmount`, `dbed_ckptquota`, `dbed_ckptremove`, `dbed_ckptrollback`, `dbed_clonedb`, `dbed_ckptumount`
- Quick I/O commands: `qio_getdbfiles`, `qio_recreate`, `qio_convertdbfiles`
- Database Flashsnap commands: `dbed_vmchecksnap`, `dbed_vmclonedb`, `dbed_vmsnap`
- Database Dynamic Storage Tiering commands: `dbdst_addvol`, `dbdst_admin`, `dbdst_classify`, `dbdst_convert`, `dbdst_file_move`, `dbdst_partition_move`, `dbdst_preset_policy`, `dbdst_rmvol`, `dbdst_show_fs`, `dbdst_tbs_move`, `dbdst_report`

SFDB features which are no longer supported

Commands which are no longer supported in release 5.1:

- ORAMAP (`libvxoramap`)
- Storage mapping commands `dbed_analyzer`, `vxstorage_stats`
- DBED providers (DBEDAgent), Java GUI, and `dbed_dbprocli`.
The SFDB Oracle features can only be accessed through the command line interface. However, Veritas Storage Foundation Manager 2.1 (a separately

licensed product) can display Oracle database information such as tablespaces, database to LUN mapping, and tablespace to LUN mapping.

- **Storage statistics: commands** `dbdst_makelbfs`, `vxdbs_fstatsummary`, `dbdst_fiostat_collector`, `vxdbs_get_datafile_stats`
- `dbed_saveconfig`, `dbed_checkconfig`
- `dbed_ckptplan`, `dbed_ckptpolicy`
- `qio_convertdbfiles -f` option which is used to check for file fragmentation
- `dbed_scheduler`

The following features are longer supported in release 5.1:

- Storage Foundation for DB2 tools
- Storage Foundation for Sybase tools

Workload Partitions support

This release provides support for the Workload Partition (WPAR) feature introduced in the AIX 6.1 operating system. Support for WPARs is limited in scope as follows:

- All Storage Foundation packages must be installed and configured in the global partition of AIX.
- Storage Foundation can be administered only in the global partition.
- Using NFS mount, the storage resources of Storage Foundation, primarily file system mount points, can be used to create and configure system or application WPARs.

SmartMove™ feature

SmartMove reduces the time and I/O required to attach or reattach a plex to an existing VxVM volume, in the specific case where a VxVM volume has a VxFS file system mounted on it. The SmartMove feature uses the VxFS information to detect free extents and avoid copying them.

SmartMove provides the following benefits:

- Less I/O is sent through the host, through the storage network and to the disks/LUNs
- Faster plex creation, resulting in faster array migrations
- Ability to migrate from a traditional LUN to a thinly provisioned LUN, removing unused space in the process

See the *Veritas Storage Foundation Advanced Features Administrator's Guide* for more information.

Thin Storage Reclamation support

Thin Storage is an array vendor solution for allocating storage to applications only when the storage is truly needed, from a pool of free storage. Thin Storage attempts to solve the problem of under utilization of available array capacity.

Thin Storage Reclamation-capable arrays and LUNs allow the administrators to release once-used storage to the pool of free storage. Storage is allocated from the free pool when files are created and written to in the file system. However, this storage is not released to the free pool when files get deleted; the administrator must perform the operation of reclaiming this storage for the free pool.

Veritas File System supports reclamation of the free blocks in the file system on Veritas Volume Manager-backed file systems. The operation of reclamation can be done on a disk, LUN, full file system, or part of a file system using the `vxdisk` and `fsadm` commands, and the `vxfs_ts_reclaim` API.

See the *Veritas Storage Foundation Advanced Features Administrator's Guide* for more information.

Veritas Volume Manager

Veritas Volume Manager (VxVM) includes the following changes in 5.1:

Support for SSD

A solid-state disk (SSD) is solid-state storage that emulates a hard disk drive (HDD) interface. Solid-state storage is a nonvolatile storage medium that employs integrated circuits rather than magnetic or optical media. The main advantage of solid-state storage is that it contains no mechanical parts. As a result, data transfer to and from solid-state storage media takes place at a much higher speed than is possible with HDD storage.

SSD devices are supported with Veritas Volume Manager. VxVM automatically discovers SSD devices and those can be displayed using the `vxdisk` and the `vxprint` commands. In this release, we support auto detection of SSD devices for FusionIO, EMC CLARiiON, Hitachi AM/WMS series, and Hitachi USPV/USPVM arrays. In case the devices are not being auto detected, the devices can be manually flagged as SSD or HDD using the `vxdisk` command.

See the `vxdisk(1M)` manual page for details.

SSD or HDD devices can be specified for allocation of VxVM volumes and the `vxassist` command with the `mediatype` attribute can be used to allocate storage on specific devices.

See the `vxassist(1M)` manual page for details.

Since SSD devices have faster read rates when compared to HDD devices, VxVM automatically picks up SSD plexes present in a mirror for reads, unless overridden by setting preferred read policy.

Note: The disk group version should be 150 or later for VxVM support for SSD devices.

See the *Veritas Volume Manager Administrator's Guide* for more information.

Handling of minor number conflicts

The volume device minor numbers in a disk group to be imported may conflict with existing volume devices. In releases of VxVM prior to 5.1, the conflicts resulted in failures; either the disk group imported failed, or the slave node failed to join for a shared disk group. When this happened, you had to run the `vxdbg reminor` command manually to resolve the minor conflicts.

In this release, VxVM can automatically resolve minor number conflicts. When there exists a minor conflict when a disk group is imported, the disk group is automatically assigned a new base minor, and the volumes in the disk group are reminored based on the new base minor. You do not need to run the `vxdbg reminor` command to resolve the minor conflicts.

See the *Veritas Volume Manager Administrator's Guide* for details.

Enhancements to the `vxconfigd` daemon

The `vxconfigd` daemon can now process some queries while a disk group import is in progress. This enhancement means that the user and agent scripts are able to check the status of Veritas Volume Manager objects during that time. In previous releases, such operations would block waiting for the import to finish.

In this release, the following commands may proceed in parallel with a disk group import:

- `vxdtl [-c] mode`
- `vxdbg list [<dgname>]`
- `vxdisk list [<daname>]`

- `vxprint [-Aqht]`

Use the following command to disable this functionality:

```
# vxdctl request_threads 0
```

Upgrading the array support

The Storage Foundation 5.1 release includes all array support in a single fileset, `VRTSaslapm`. The array support fileset includes the array support previously included in the `VRTSvxvm` fileset. The array support fileset also includes support previously packaged as external array support libraries (ASLs) and array policy modules (APMs).

See the 5.1 Hardware Compatibility List for information about supported arrays.

<http://entsupport.symantec.com/docs/330441>

When you upgrade Storage Foundation products with the product installer, the installer automatically upgrades the array support. If you upgrade Storage Foundation products with manual steps, you should remove any external ASLs or APMs that were installed previously on your system. Installing the `VRTSvxvm` fileset exits with an error if external ASLs or APMs are detected.

After you have installed Storage Foundation 5.1, Symantec provides support for new disk arrays through updates to the `VRTSaslapm` package.

For more information about array support, see the *Veritas Volume Manager Administrator's Guide*.

The `vxdmpinq` utility renamed to the `vxscsiinq` utility

The diagnostic utility `vxdmpinq` has been renamed to the `vxscsiinq` utility.

Enhancements to DMP support for SAN booting

This release includes the following enhancements for DMP support for SAN booting:

- Added support for mirror rootvg and rootvg spanning multiple physical volumes.
- Added support to extend or reduce a rootvg under DMP control by adding or removing SAN disks.
- Added command to list rootvg boot paths on which DMP root was enabled.
- Added support for A/A-A and ALUA type arrays.
- Migrated `vxdmproot` functionality to the `vxdmpadm` command.

In previous releases, the `vxdmproot` command was provided to manage AIX root volume groups. In this release, the `vxdmadm native` command replaces the `vxdmproot` command.

See the *Veritas Volume Manager Administrator's Guide* for details.

Veritas Volume Replicator

Veritas Volume Replicator includes the following changes in 5.1:

SmartMove for VVR

The SmartMove for VVR feature enables VVR to leverage information from VxFS knowledge of the file system blocks in use to optimize the time and network bandwidth required for initial resync of replicated volumes.

See the *Veritas Volume Replicator Administrator's Guide* for more information on SmartMove for VVR.

Veritas Volume Replicator supports IPv6

Veritas Volume Replicator supports IPv6 in this release. IPv6 is supported only with disk group version 150 or later.

The Internet Protocol version 6 (IPv6) is the next-generation Internet Layer protocol for packet-switched networks and the Internet. IPv4 is the first version of the protocol to be widely deployed. IPv6 has a much larger address space than IPv4. This results from the use of a 128-bit address, whereas IPv4 uses only 32 bits. This expansion provides flexibility in allocating addresses and routing traffic and eliminates the primary need for network address translation (NAT). IPv6 also implemented new features that simplify aspects of address assignment and network renumbering when changing Internet connectivity providers. Network security is integrated into the design of the IPv6 architecture.

See [“IPv6 software limitations”](#) on page 35.

See the *Veritas Volume Replicator Administrator's Guide* for more information on VVR IP terminology.

See the *Veritas Storage Foundation Installation Guide* for more information on planning and upgrading VVR from a previous version of IPv4 to IPv6.

Veritas File System

Veritas File System includes the following changes in 5.1:

Page I/O no longer restricted to 128k

VxFS can now issue I/O in sizes greater than 128k to a lower layer.

In previous releases, VxFS broke page I/O that was greater than 128k into multiple chunks of 128k or smaller before issuing an I/O request to a lower layer. This restriction existed because each buffer passed to VxFS can have pre-xlation information for 32 pages, only, by default.

Storage Foundation for Databases supported features

See “[Changes to Storage Foundation for Databases \(SFDB\) functionality](#)” on page 24.

Note: Storage Foundation supports running SFDB tools with Oracle databases only.

For the most current information on Storage Foundation products and single instance Oracle versions supported, see:

<http://entsupport.symantec.com/docs/331625>

System requirements

This section describes the system requirements for this release.

Hardware and software requirements

The hardware compatibility list contains information about supported hardware and is updated regularly. Before installing or upgrading Storage Foundation and High Availability Solutions products, review the current compatibility list to confirm the compatibility of your hardware and software.

For the latest information on supported hardware, visit the following URL:

<http://entsupport.symantec.com/docs/330441>

For information on specific HA setup requirements, see the *Veritas Cluster Server Installation Guide*.

Supported AIX operating systems

This section lists the supported operating systems for this release of Veritas products.

Product installation scripts verify the required update levels. The installation process terminates if the target systems do not meet the maintenance level requirements.

For any Veritas cluster product, all nodes in the cluster must have the same operating system version and update level.

The minimum system requirements for this release are as follows:

AIX 5.3 at one of the following levels:

- TL7 with SP6
- TL8 with SP4
- or any higher TLs.

AIX 6.1 at one of the following levels:

- TL0 with SP6
- TL1 with SP2
- or any higher TLs.

For important updates regarding this release, review the Late-Breaking News TechNote on the Symantec Technical Support website:

<http://entsupport.symantec.com/docs/334998>

Disk space requirements

Before installing any of the Veritas Storage Foundation products, confirm that your system has enough free disk space.

Use the "Perform a Preinstallation Check" (P) menu or the `-precheck` option of the product installer to determine whether there is sufficient space.

```
# ./installer -precheck
```

Storage Foundation and High Availability Solutions 5.1 patches

Symantec strongly recommends that you install Storage Foundation and High Availability Solutions (SFHA) 5.1 Patch 1 immediately after you install SFHA 5.1.

The patch for AIX is available at the following URL:

<https://vos.symantec.com/patch/detail/2956>

Database requirements

The following TechNote identifies the most current information on supported database and operating system combinations:

<http://entsupport.symantec.com/docs/331625>

Note: Storage Foundation supports running Oracle, DB2, and Sybase on VxFS and VxVM.

Storage Foundation does not support running SFDB tools with DB2 and Sybase.

Component product release notes

In addition to reading these Release Notes, review all component product release notes before installing the product.

The component product release notes for this release are included as PDF files on the software disc:

- *Veritas Storage Foundation Cluster File System Release Notes* (*sfcfs_notes.pdf*)
- *Veritas Storage Foundation for Oracle RAC Release Notes* (*sfrac_notes.pdf*)
- *Veritas Cluster Server Release Notes* (*vcs_notes.pdf*)

Software limitations

The following sections describe Storage Foundation software limitations that exist in this release.

See the *Veritas Cluster Server Release Notes* for VCS software limitations.

Veritas Storage Foundation software limitations

The following are software limitations in the 5.1 release of Veritas Storage Foundation.

LLT over IPv6 UDP cannot detect other nodes while Storage Foundation tries to form a cluster

LLT over IPv6 requires link-local scope multicast to discover other nodes when Storage Foundation tries to form a cluster. If multicast networking is undesirable, or unavailable in your environment, use the address of the peer nodes to eliminate the need for the multicast traffic. [1533308]

Workaround: Add the set-addr entry for each local link into the /etc/llttab file. You add the entry to specify the address of the peer nodes that are available on the corresponding peer links. For example, you add the following lines into the llttab file to specify the set-addr entry for a node. In this example, the node's IPv6 address is fe80::21a:64ff:fe92:1d70.

```
set-addr 1 link1 fe80::21a:64ff:fe92:1d70
set-arp 0
```

RSH does not support IPv6 address

The product installer does not support installation by RSH using an IPv6 address as a system name in the command line.

Veritas Volume Manager software limitations

The following are software limitations in this release of Veritas Volume Manager.

Cluster Volume Manager (CVM) fail back behavior for non-Active/Active arrays (1441769)

This describes the fail back behavior for non-Active/Active arrays in a CVM cluster. This behavior applies to A/P, A/PF, APG, A/A-A, and ALUA arrays.

When all of the Primary paths fail or are disabled in a non-Active/Active array in a CVM cluster, the cluster-wide failover is triggered. All hosts in the cluster start using the Secondary path to the array. When the Primary path is enabled, the hosts fail back to the Primary path. However, suppose that one of the hosts in the cluster is shut down or brought out of the cluster while the Primary path is disabled. If the Primary path is then enabled, it does not trigger failback. The remaining hosts in the cluster continue to use the Secondary path. When the disabled host is rebooted and rejoins the cluster, all of the hosts in the cluster will continue using the Secondary path. This is expected behavior.

For A/P, APG, A/A-A, and ALUA arrays, if the disabled host is rebooted and rejoins the cluster before the Primary path is enabled, enabling the path does trigger the failback. In this case, all of the hosts in the cluster will fail back to the Primary path.

DMP settings for NetApp storage attached environment

To minimize the path restoration window and maximize high availability in the NetApp storage attached environment, set the DMP restore daemon cycle to 60 seconds. The default value of this tunable is 300 seconds. The change is persistent across reboots.

Issue the following command at the prompt:

```
# vxdmpadm settune dmp_restore_internal=60
```

To verify the new setting, use the following command:

```
# vxdmpadm gettune dmp_restore_internal
```

DMP settings for AIX SAN boot environment

To minimize the path restoration window and maximize high availability in the AIX SAN boot environment, set the DMP path aging tunable to 120 seconds. The default value of this tunable is 300 seconds. The change is persistent across reboots.

Issue the following command at the prompt:

```
# vxdmpadm settune dmp_path_age=120
```

To verify the new setting, use the following command:

```
# vxdmpadm gettune dmp_path_age
```

Veritas File System software limitations

The following are software limitations in this release of Veritas File System

Cached ODM

You can enable Cached ODM only for files on local file systems. It can not be enabled for files on Cluster File System.

Veritas Volume Replicator software limitations

The following are software limitations in this release of Veritas Volume Replicator.

IPv6 software limitations

VVR does not support the following Internet Protocol configurations:

- A replication configuration from an IPv4-only node to an IPv6-only node and from an IPv6-only node to an IPv4-only node will not be supported, because the IPv6-only node has no IPv4 address configured on it and so VVR cannot establish communication between the two nodes.
- A replication configuration in which an IPv4 address is specified for the local_host attribute of a primary RLINK and an IPv6 address is specified for the remote_host attribute of the same RLINK.

- A replication configuration in which an IPv6 address is specified for the local_host attribute of a primary RLINK and an IPv4 address is specified for the remote_host attribute of the same RLINK.
- IPv6 will not be supported in a CVM and VVR cluster where some nodes in the cluster are IPv4-only and other nodes in the same cluster are IPv6-only, or all nodes of a cluster are IPv4-only and all nodes of a remote cluster are IPv6-only.
- VVR will not support Edge and NAT-PT routers that facilitate IPv4 and IPv6 address translation.

VVR support for replicating across Storage Foundation versions

VVR supports replication between Storage Foundation 5.1 and the prior major releases of Storage Foundation (5.0 or 5.0MP3). Replication between versions is supported for disk group versions 120, 140, and 150 only. Both primary and secondary host must be using a supported disk group version.

Fixed issues

The following sections describe Storage Foundation issues that were fixed in this release.

See the *Veritas Cluster Server Release Notes* for VCS fixed issues.

Veritas Storage Foundation fixed issues

There are no Veritas Storage Foundation fixed issues in the 5.1 release.

Storage Foundation for Databases (SFDB) tools fixed issues

[Table 1-2](#) describes fixed issues in the Storage Foundation 5.1 release.

Table 1-2 Veritas Storage Foundation for Databases (SFDB) tools fixed issues

Incident	Description
1728611	The DBED directories that are present in <code>/var/vx/vxldb</code> are no longer world writable.
1719617	The owners of OS_DIRECTORIES are not changed after installing SFDB package.
1535906	Fix the VRTSdbed package to be installed on TCB enabled system.
1535235	Allows user defined mount points for snapshot clones.

Table 1-2 Veritas Storage Foundation for Databases (SFDB) tools fixed issues (continued)

Incident	Description
1535234	OEM storage plugins are usable across platforms.
1535232	Standby (dataguard) support for checkpoint flashsnap.
1535231	All DBED commands work from the CVM slave.
1535230	Extend support for multi-dg support with snapshot.
1531216	Fixed the <code>dbed_vmchecksnap</code> script error, if the "dco" volume did not have the string "_dco" in its name.
1525096	The DBED files that are present in <code>/tmp</code> are no longer world writable.
1525094	Changed the DBED repository database engine from Sybase ASA to SQLite.
1512850	Maked SFDB script IPV6 complaint.
1505177	Improved boot performance of DBED components.
1503356	The DBED scripts clean up correctly on failure.
1480379	Simplified the Storage Foundation for Databases packaging.
1361604	Fixed the usage examples in the <code>dbdst_report</code> manual page.
1121091	You do not need to add the <code>_ora</code> suffix to use the <code>dbdst</code> manual pages.
862687, 862092	Database FlashSnap clones supports <code>DB_RECOVERY_FILE_DESTINATION</code> as the sole mandatory archive log destination.

Veritas Volume Manager and Veritas Volume Replicator fixed issues

The Storage Foundation 5.1 includes cumulative fixes for Veritas Volume Manager and Veritas Volume Replicator since the 5.0MP3 release. The following tables describe these fixed issues.

[Table 1-3](#) describes fixed issues in the Veritas Volume Manager 5.1 release.

Table 1-3 Veritas Volume Manager and Veritas Volume Replicator 5.1 fixed issues

Incident	Description
1822681	memory leak in vxio/voldr1_cleansio_start.
1822200	VRAS:Diff sync failed when remaining sync size is 4TB.
1819777	Panic issue in voldiosio_start() as race window exists while handling duplicate DA records
1810749	CR 6874695 - vxlustart -V deleted existing BEs
1805826	panic in vol_klog_clear_trans on Solaris x86
1804262	VVR:File system I/O of size bigger than 256k fails with error ENXIO after 2TB(>2G blocks)offset.
1797540	VxVM: vxdisk resize intermittently causes vxconfigd to dump core.
1795541	vxddladm disablevscli does not work for this customer
1782036	Sun: SC cannot open libvxvm.so after upgrade to 5.1
1779257	VVR:Disable Secondary logging through a tunable.
1765779	Man Page change for vxiod
1764972	vxdiskadm option 5 fails with "/usr/lib/vxvm/voladm.d/bin/disk.repl"
1762561	DMP: System panic when perform excludearray operation with powerpath
1762534	vxctl settz and vxconfigd core dump if TZ environment variable is not set.
1755869	tunable addition: gabmaxsend and receiver flowcontrol watermark
1755830	kmsg: sender: the logic for resend of messages needs to be optimized
1755810	kmsg: sender thread is woken up unnecessarily during flowcontrol
1755788	for a broadcast message, sender thread may end up sending the same message multiple times (not resend)
1755735	recovery I/Os get broken down to voliomem_chunk_size
1755707	vxtask list shows the same taskid for parent and child tasks
1755689	During recovery, -o delayrecover option does not work as expected for value of 0

Table 1-3 Veritas Volume Manager and Veritas Volume Replicator 5.1 fixed issues (*continued*)

Incident	Description
1755628	kmsg layer: with heavy messaging in the cluster the receiver thread slows down processing
1755519	kmsg layer: receiver side flowcontrol is not supported
1755466	vol_find_iloc: searching of ilock is inefficient
1745992	CVR:I/O hang in 4 node CVR cluster
1744672	Oakmont::Primary slave hangs in volcvm_rvgrecovery_send_iocnt() TC remote_write_reconfigure_2.tc
1744224	FMR3: multiple vxplex attach cmds running in parallel on a volume lead to clearing DCO map and subsequently lead to corruption
1742702	vxvmconvert fails, probably due to wrong disk capacity calculation
1739513	while mirroring 1 tb storage,after 800gb all VM commands hangs
1733811	System panic on voldco_isdirty code path while doing vxsnap make operation after upgrading from DCO version 10
1732200	[DMP][Usability] When NEW dmp_native_multipathing tunable is set to 'on' - unlabelled LUNs vanish from format until turned off
1728587	VVR: Replication started with a checkpoint remains inconsistent/cant_sync after SRL is drained if the replication is interrupted
1728269	Incorrect cur_pri_path updation for A/PG arrays leading to dmp database inconsistency
1725041	VVR: VRAS: vradmin addsec fails with "V-5-52-502 Host name or IP XXX.YYY.ZZZ is not configured or available on the Primary."
1722984	Memory leak in vold_dg_get_clone_disks() .
1718008	Unable to initialize EFI LUNs controlled by EMC Powerpath driver, vxprtvtoc "Syntax Error" occurs.
1715889	Unable to encapsulate an unmanaged EMC DMX PP LUN
1711269	System hang showing kmsg receiver thread hogging CPU
1710030	AIX: Issue with LUN size more than TB

Table 1-3 Veritas Volume Manager and Veritas Volume Replicator 5.1 fixed issues (*continued*)

Incident	Description
1678370	VM_VVR: RLINK disconnected and "vx" commands hung on Secondary while load in progress
1678292	[SxRT sparc/x64] vxdumpadm get tpdnodename error
1677217	DMP does not autofailback to the Primary paths following LCC card restoration.
1676061	System panic'd after 2 out of 4 paths to disk were removed.
1674847	Fixed an issue with vxconfigd not starting after a system reboot.
1673764	vxconfigd loses licensing information
1673002	Need to remove thousands of empty /tmp/vx.* directories.
1653972	VxVM volume device permissions change after running 'scgdevs' (Suncluster) command
1638494	VVR:vxnetd stop causing 100% CPU & vx commands hanging
1638174	oakmont:vxconfigd memory leak found
1637514	Issues with tentative evacuation of disks, when aborted in between using vxevac
1594928	Avoid unnecessary retries on error buffers when disk partition is nullified.
1592700	cvmvoldg monitor failed due to awk: Input line cannot be longer than 3,000 bytes - VRTScavf 5.0.31.0
1591146	mirrored volume grow doesn't works well if "mirror=enclosure" option is used, it leads to data corruption issue.
1589018	num_retries field is getting re-initialized to initial value leading to looping and delay in error handling time.
1588978	vxdumpadm getattr arrayname <array> partitionsize misreports DEFAULT partitionsize for subsequent entries
1555461	DMP did not handle the failure in one half of the customer SAN
1545999	Oracle hangs from time to time - VxVM 5.0 MP3 on RHEL5
1545835	vxconfigd core dump during system boot after VxVM4.1RP4 applied.

Table 1-3 Veritas Volume Manager and Veritas Volume Replicator 5.1 fixed issues (*continued*)

Incident	Description
1543908	While running vxevac command, Oracle process thread stuck into ogetblk() which leads to i/o hang.
1541662	System panicked in DRL code when running flashsnap
1538053	CVM_MSG_REQ_GSLOCK repeatedly resent resulting in hang
1537821	VxVM private buffer's b_fsid field is not set properly, which breaks PRM
1531406	Race condition between Dynamic Reconfiguration thread and DMP error analysis code path lead to panic in gendmpiodone.
1530126	DMP : dmplinux_unplug() panic on linux, for no associated node in dmpnode
1517760	VRAS: vradmind core dump if stats collection is enabled
1510252	I/Omem chunks are not combined, causing panic at module unload time
1506690	VxVM utility scripts assume DA name is a valid path name.
1503309	VxVM: DMP doesn't log error returned from below driver/SCSI.
1483298	Man page for vxctl does not include all options that are listed in -H.
1480102	dmp disabled all paths of EVA8100 even though just unplugged primary FC cables
1475710	For VxVM patches the postinstall script must not copy /usr/lib/libthread to /etc/vx/slib/
1475703, 1369599	Export API libvxvm_get_disks() and libvxvm_get_subpaths() should return the same path for the same device
1475697	Provide an API for checking multi- ownership and status of a diskgroup
1475691	VxVM should recognize disks in use by ZFS or SVM
1471821	'initdmp' section in vxctl manpage still incorrect
1471784	[5.0MP3RP1 x64] vm can not create stripe-mirror/mirror-stripe/mirror volume with maxsize.
1471771	vxdisksetup should call 'mount' with complete pathname

Table 1-3 Veritas Volume Manager and Veritas Volume Replicator 5.1 fixed issues (*continued*)

Incident	Description
1471581	vxconfigd may hang if no SCSI timeout value is set while issuing various SCSI commands
1471487	Critical Minimum Queue and Round-robin Improvements
1471263	machine has panicked when added the disk from dg as a foreign device using "vxdmpadm addforeign".
1470732	5.0MP3 : vxconfigd dumps core if all paths are excluded.
1470251	volslabd utilized 100% cpu time
1470102	vxdmpadm getattr for failoverpolicy and tpdmode is giving usage error.
1469351	User confused about snap operations when split to new DG
1468647	vxdmpdebug fails to find ugettxt
1463197	no path disable event occurs during I/O error analysis in dmp when pulling a FC cable out with 5.0MP3
1460101	[VxVM]Proper handling of DMP PGR ioctl's in case of errors/warnings from below driver.
1443748	In a clustered environment the recovery of volumes having DCO v20 taking lots of time with no I/O load
1443046	System panic in vxio:voldr1_trans_copy
1441123	VxFS Corruption Detected when DCM log plex are attached with mirrored volume and VVR is not configured.
1437869	Need to examine package dependencies, especially wrt SUNWscpu...
1437006	DMP: Evaluation of DMP I/O statistics and TC development to verify correctness of the values displayed
1433535	DDL: Data corruption protection activated message should be reported by vxdisk scandisks and vxdctl enable CLI
1430001	VM: VVR: Not able to modify any of the volume manager kernel tunable on 4.1MP3 perf.
1425250	vx commands are hanging in EDC testing
1424194	vxclustadm reinit doesn't allow new nodes to join CVM cluster

Table 1-3 Veritas Volume Manager and Veritas Volume Replicator 5.1 fixed issues (*continued*)

Incident	Description
1422008	After installed vm patch on AIX, "install-db" would be created if the vxio in "Defined" state.
1421752	High kernel CPU usage when DRL is turned on
1415547	Tool request - Verification tool to detect corrupted DCO.
1409031	VVR: Rlink fail to connect due to failure of memory allocation for incoming message buffer
1402599	VVR: Print warning message in syslog if it hit high water mark for latency protection
1398914	Support cdsdisk format on devices that do not support scsi modesense on page 3 and page 4.
1396566	Permissions set using vxedit is not consistent
1391652	No path disable event and I/O hang occurred when pulled out both paths of A/PG array with 4.0MP2RP8
1388324	Unresolved symbols in libvxvmc.so
1386592	tmp files not cleaned up after running vxdisksetup
1369610	Error message from vxdg import misleading/incorrect when disk is write-protected
1369597	vxlufinish uses wrong solaris command for unmounting alternate root environment - should use luumount
1361625	with use_all_paths=yes, get a reservation conflict
1321282	vxdisk scandisk hung in site failure scenario (EDC Testing)
1317186	Security: Remove tmp files in scripts before using them
1299512	incorrect vxdg free output and vxconfigd core dump
1293910	vxdmproot man page needs correction on arrays supported by DMP for SAN booting
1292633	PFTO value is set for only one paths though the DMP node has multiple paths.
1277808	VVR: Write testcase for link-breakoff snapshot with RVG.

Table 1-3 Veritas Volume Manager and Veritas Volume Replicator 5.1 fixed issues (*continued*)

Incident	Description
1274204	vxbrk_rootmir fails if a volume name = end of another vol name
1235023	V-5-1-4597 vxdg join failed. Transaction aborted waiting for io drain
1230827	vxdisksetup init succeeds but both prtvtoc & vxdiskunsetup fail with error "No Such Device"
1224778	Write disable R2 device(SRDF)not seen after boot
1222625	VCS 5.x CVMCluster Agent doesn't handle non-C locales.
1212256	Panic in uphysdone due to double Iodone on the buffer
1183283	vxconfigstore -p returns with syntax error
1176510	Enhance vxdiskadm to handle custom-made rootdisk and rootmirror
1172961	AIX: VxVM should call uphysio() with a proper value for bufcnt argument
1153020	CVM master's behavior with dgfailpolicy=leave in 5.0 differs from the description of manual
1123203	vxconfigd hang in transaction commit while acquiring rwsleep write lock
1114870	System panic in voliomem_seek() due to wrong calculation of no of dco I/O extents.
1082431	During VCS During cluster shutdown of a node, vxconfigd died requiring a reboot
1082149	vxconvert command fails to convert for VPATH devices
1068259	VVR:Primary hang in case of TCP replication, secondary not sending ack
1060336	vxresize should not roll back if fsadm failed but disabled vxfs
1037289	IO Errors during SVC node add/remove test sequence
1020554	Diskgroup are not importing on every second or 3rd reboot. Needs to manually import it and mount the volumes
1016617	vxsnap refresh on SOSS fails with "VxVM vxvol WARNING V-5-1-10070 Failed to synchronize the volume(s)"

Table 1-3 Veritas Volume Manager and Veritas Volume Replicator 5.1 fixed issues (*continued*)

Incident	Description
1012999	APIs needed for checking whether diskgroup is shared and status of diskgroup
996429	Unable to set no limit for cmd logs using vxcmdlog -n no_limit
990338	FMR Refreshing a snapshot should keep the same name for the snap object
963951	INSTSNAPTMP marked dco log not getting deleted during vxrecover or volume restart
818389	a scsi-2 release is causing a panic
795129	cmhaltcl on one of the cluster nodes causes one of the disk groups to lose shared flag
786357	Request to make voldr1_volumemax_drtregs a tunable
597517	unable to initialize EFI labeled >1tb PP devices
543638	vxddm/vxdiskunsetup doesn't work well if tpdmode=native
339282	RFE : Failed to create more than 256 config copies in one DG
339187	CVM activation tag in vxprint -m output breaks vxprint
314738	vxdg split fails if the cvm master changes
298072	vxio reports "Illegal vminor encountered" even when there is no rootability
248925	If vxdg import returns error, parse it

[Table 1-4](#) describes fixed issues in the Veritas Volume Manager 5.0MP3 RP1 release.

Table 1-4 Veritas Volume Manager and Veritas Volume Replicator 5.0MP3 RP1 fixed issues

Incident	Description
1512521	StorageKeys: Adding compilation flag for VxVM to make function pointer references to legacy modules work in AIX 6.1 key aware code.
1455062	Fixed an issue with the master node crashing if a node leaves before responding to the MV- serialization protocol.

Table 1-4 Veritas Volume Manager and Veritas Volume Replicator 5.0MP3 RP1 fixed issues (*continued*)

Incident	Description
1449266	Fixed a panic in dmp_get_path_deferq while creating a volume.
1443752	Fixed an issue in a clustered environment the recovery of volumes having DCO v20 taking lots of time with no I/O load.
1443706	Fixed an issue in FMR3, I/Os initiating DCO updates for clearing DRL async clear region may not wait for its completion.
1441131	Fixed an issue with VxFS Corruption Detected when DCM log plex are attached with mirrored volume and VVR is not configured.
1441072	Fixed an issue with siteread policy is not honored.
1442369	Fixed a bug in vxconfigbackupd script leading to 0 byte binconfig file being created.
1224659	
1441020	Fixed a secondary panic due to double free of message with TCP protocol and 16 connection.
1440837	Fixed a panic due to memory allocation failure in interrupt context.
1436917	Fixed an issue with after installing VM patch on AIX, install-db would be created if the vxioin Defined state.
1435471	Fixed an issue with the cluster nodes panicking in voldco_or_pvmbuf_to_pvmbufcode after installing 5.0 MP3.
1431279	Fixed an issue with vxconfigd core dumps.
1428106	Fixed a system panic in vxio:voldrl_trans_copy.
1427284	Fixed an issue with vxdmpadm dumped core when executing vxdmpadm list dmpnode command.
1427267	Fixed a CVR panic in VOLSIOQ_MORE due to corrupted volsioq_start queue.
1425919	Fixed an issue with vxesdlooping using 100% of one CPU.
1425434	Fixed an issue with CVR fails to connect rlinks followed by vxconfigd hangs on secondary.
1414441	The vxsnap manual page includes mirror=enclosure parameter to avoid being mirrored on the same enclosure.

Table 1-4 Veritas Volume Manager and Veritas Volume Replicator 5.0MP3 RP1 fixed issues (*continued*)

Incident	Description
1414381	Fixed an issue with VVR I/O hanging due to the wrong generation number assignment after recovery.
1411636	Fixed a secondary log error causing rlink disconnect after IBC unfreeze.
1403123	Fixed an issue with vxconfigd sleeping and no vx commands were responding.
1397879	Enhanced the vxresize manual page to run from non-CVM master.
1397712	Fixed an issue with the vxsnap restore manual page is unable to properly freeze or thaw file systems in a CVM environment.
1396427	Enhanced DMP to handle failing IO when it is not able to interpret sense data.
1389584	Fixed a system panic in vol_putdisk() code.
1389512	Able to force import diskgroup version 80 in VxVM 5.0.
1387033	Fixed a system panic in bcopy() due to null passed in from volioctl_copyin()
1385922	Fixed a system panic due to memory allocation.
1376656	Fixed an issue with vxcached never deletes old snaps when cache hits HWM.
1372340	Fixed an issue with vxplexcore dumps during vxassist addlog due to DRL log length being less than 33 blocks.
1368752	Fixed an issue when there are no mirrors to read, VOL_READ_MIRRORS ioctl returns -1 instead of 1.
1364335	Created a command to verify whether the DMP is controlling the rootdisk.
1364332	Fixed an issue with the VM commands not working on DMP Enabled boot path.
1364324	Fixed an issue with VSCSI: A/P LBI/O policy not working with enabled DMP support on boot devices.

Table 1-4 Veritas Volume Manager and Veritas Volume Replicator 5.0MP3 RP1 fixed issues (*continued*)

Incident	Description
1364320	Fixed a issue with vxdmproot install causing machine to hang upon reboot.
1314301	Fixed an issue with vxlustart.
1266730	Fixed the vxtask command to display the resync progress subtask for shared volumes with DRL.
1230360	Fixed a system panic in vol_klog_start() due to accessing freed mv read_sio.
1192105	Fixed the vx dg -n [newdg] deport [origdg] command causing a memory leak.
1182475	Fixed the vx dg split failing if the CVM master changes.
425273	Fixed an issue with VVR RU thread not starting nio after it is created from than waiting for all replicas to have NIO's created.

[Table 1-5](#) describes fixed issues in the Veritas Volume Manager 5.0MP3 RP2 release.

Table 1-5 Veritas Volume Manager and Veritas Volume Replicator 5.0 MP3 RP2 fixed issues

Incident	Description
850816	You can now delete snap objects from a mounted volume.
1097258	The vxconfigd daemon no longer hangs when an array is disconnected.
1108839	Turning on the dmp_cache_open tunable no longer slows down the vxconfigd daemon when run with 2048 dual path LUNs.
1184280	Added additional debug messages around the VE_BADPROTOV error message to improve debugging.
1195591	Fixed the cause of a panic when a cluster had an empty RVG.
1222125	Fixed an issue in which after converting a big volume group, you could not mount a file system on the volume.
1224659	Fixed an issue in which the vxconfigbackup -p script sometimes created a zero-length .binconfig file.

Table 1-5 Veritas Volume Manager and Veritas Volume Replicator 5.0 MP3 RP2 fixed issues (*continued*)

Incident	Description
1286298	Fixed an issue in which proper locks were not taken in all necessary places while modifying last_sent_seqno.
1287975	The vxclustadmcommand has a segmentation fault when the main.cf file contains lines that are greater than 512 characters.
1314961	Fixed an issue in which if a disk tag name contained long DBCS characters, the configuration daemon was not accessible.
1321272	Fixed the an issue in which some VxVM commands hung after disconnecting, then reconnecting to the FC site link.
1321298	Fixed the cause of a vxconfigd daemon core dump that occurred after reconnecting the FC site link and heartbeat link.
1370927	Fixed an issue in which the VTOC of disks in a cluster became corrupted.
1374603	Fixed a cause of data corruption in the dmp_bypass_iodone() call.
1380386	The appropriate number of I/O threads are now created for systems with more than 8 CPUs.
1388883	Fixed an issue in which rebooting a controller caused the diskgroups to be disabled.
1393764	Fixed an issue in which the vxconfigd daemon hung on a node that tried to become the master on site 2 when the Fibre Channel and heartbeat link was disabled at same time.
1408367	Fixed the cause of a system panic when mutex_panic() was called from vol_rwsleep_wrlock().
1411438	The dynamic multi-pathing tunable dmp_enable_restore value is now persistent when it is set to OFF.
1414336	Fixed an issue in which some disk devices did not appear in the vxdisk list command output.
1414469	Fixed an issue in which the vxddladm listsupport alldid not display up-to-date information.
1416080	Fixed the cause of a system panic in the vol_change_disk() routine that was due to NULL pointer dereference.

Table 1-5 Veritas Volume Manager and Veritas Volume Replicator 5.0 MP3 RP2 fixed issues (*continued*)

Incident	Description
1421353	Fixed an issue in which I/O got stuck in the <code>drl_logbusy</code> queue due to corruption of the age node LRU list.
1425338	Fixed an issue in which connect rlinks failed to be connected, followed by <code>vxconfigd</code> hanging on a secondary node.
1445884	Fixed an issue in which the <code>vxdisk -e list</code> command dumped core.
1446208	Changed message V-5-1-2140 from an error message to an informational message.
1446216	Fixed an issue in which LUN mapping changes on node 0 caused node 1 and node 2 to panic.
1449001	Enabled the auto-compiler flag selection, which is used for enabling and disabling storage keys support.
1449264	Fixed the cause of a panic in <code>dmp_get_path_deferq</code> that occurred while creating a volume.
1450348	Fixed a potential hang/panic that was due to a race condition between an RU thread and a volume read completing during DCM replay.
1457132	Fixed the cause of data corruption when running the <code>vxddmpadm disable pathand vxddmpadm disable ctrl</code> commands.
1458792	Fixed an issue in which the <code>*unit_io</code> and <code>*pref_io</code> tunables became set to 32 MB after upgrading from the Storage Foundation 5.0 MP1 release to the 5.0 MP3 release.
1459831	Fixed an issue in which replication hung due to a deadlock on a secondary that had a TCP multiconnection and was managed by <code>nmcom</code> .
1460582	Fixed an issue in which the <code>vxddmpadm -f disable enclosure</code> command failed with a Segmentation Fault and dumped core.
1461314	DMP no longer uses the SCSI bypass on single path disks for path-suppressing TPD.
1461338	VxVM now correctly handles CPU affinity switching.
1461717	Fixed an issue in which the <code>vxsnap make</code> command caused the <code>vxconfigd</code> daemon to hang.

Table 1-5 Veritas Volume Manager and Veritas Volume Replicator 5.0 MP3 RP2 fixed issues (*continued*)

Incident	Description
1463547	Fixed the cause of a vxconfigd core dump that occurred when dynamically reconfiguring a LUN.
1469487	The I/O buffer start time is no longer modified as part of error analysis.
1470548	Fixed an issue in which a campus cluster detached site could not be reattached.
1471003	Fixed an issue in which the vxvg -s import oradg command failed with following error on a campus cluster: V-5-1-10978 Disk group oradg: import failed: required lock not held in transaction
1471658	Fixed the cause of a vxconfigd daemon core dump that occurred in the priv_get_all_udid_entry() call.
1471754	Fixed the cause of a vxconfigd daemon core dump that occurred in the ssb_increment_dg_abort() call.
1471763	Fixed the cause of the following error: build_devlink_list: readlink failed for /dev/vx/rdisk/ludg: Invalid argument
1471813	The vxddmpadm start restorecommand now indicates that the restore daemon cannot be started when the dmp_enable_restore tunable is set to OFF.
1472736	Fixed the cause of a system panic in the vxddmp module that was due to a NULL pointer dereference.
1473638	Fixed the cause of a failover in the IOCTL context for coordinator disks.
1475707	Added an error message for attempting to import unwritable disks.
1477143	The cluster volume manager failback protocol is now triggered when cur_pri is null and at least one DMP node of the same LUN group is DMPNODE_SHARED.
1479729	Fixed the cause of an I/O hang on the primary node after a secondary node crashed.
1479735	Fixed the cause of an I/O hang on a slave if the master (logowner) crashed with a data change map active.
1480315	Fixed an issue in which VxVM performed a full re-sync of a volume that was created in the background when the volume's diskgroup was imported.

Table 1-5 Veritas Volume Manager and Veritas Volume Replicator 5.0 MP3 RP2 fixed issues (*continued*)

Incident	Description
1482687	Fixed the cause of an I/O hang during and after CVM reconfiguration following a reboot of the master node.
1483164	Fixed an issue in which disks with the NOLABEL state were usable via the CLI.
1483201	Fixed an issue in which the Device Discovery Layer (DDL) sometimes set the unique disk identifier (UDID) value to INVALID. Multiple disks set to INVALID resulted in the following error: VxVM vxio V-5-0-1056 new disk disk_id has a non-unique UDID
1483643	Fixed an issue in which a raid 5 volume would not start on 3PAR Thin Provisioning LUNs.
1484919	Fixed an issue in which a system that was upgraded to the 5.0 MP3 release could not be booted.
1485379	Fixed an issue in which the vxtask -l list command displayed incorrect progress of the vxsnap addmir command, which was used to link a snapshot volume to the source volume.
1488084	Fixed an issue in which the vxdmpadm iostat command reported different amounts of read/write blocks than the vxstat, iostat, and sar -d commands.
1500389	The vxrootadm command now automatically enables the use-nvramrc? variable.
1501165	Changed the V-5-1-2140 message from an error to a warning.
1502842	Fixed an issue in which the dmppolicy.infofile did not get updated after upgrading the packages from Storage Foundation (SF) 5.0 MP3 RP1 to SF 5.1.
1503168	Fixed an issue in which the diskgroup for disks without a private region (nopriv disks) could not be imported.
1507291	Fixed an issue in which setting the dmp_monitor_fabric value to ON triggered unexpected offlining of paths on a DMX4 array.
1507935	Fixed an issue in which the vxconfigddaemon dumped core when the settag keyword was used to specify a long site name in a campus cluster.

Table 1-5 Veritas Volume Manager and Veritas Volume Replicator 5.0 MP3 RP2 fixed issues (*continued*)

Incident	Description
1508462	Fixed the cause of a vxconfigd hang that occurred due to a split brain condition on a cluster.
1512352	Fixed an issue in which the vxconfigrestore command failed with the following error: VxVM vxconfigrestore ERROR V-5-2-3706 Diskgroup configuration
1512805	Fixed an issue in which two disks from different enclosures with the same array volume ID were treated as duplicate array volume IDs.
1515581	Fixed an issue in which recreating a shared diskgroup put CVMVolDg in an empty KSTATE and offlined clustered file systems.
1525121	Fixed an issue in which EFI disks were in an error state after installing the Storage Foundation 5.0 MP3 RP1 patches.
1525819	Fixed an issue in which the vxconfigbackup command failed to work on a diskgroup that had 2 TB LUNs.
1527247	Fixed an issue in which the vxstat command showed twice the I/O activity on a mirror volume compared to the source volume.
1528368	Fixed the cause of an I/O hang during the data change map transition after performing vxresize operations on the primary node.
1529157	The vxdisk -e listcommand output now includes a wider range of values for the TYPE and STATUS columns.
1532363	Fixed an issue in which the vxdisk updateudid command is corrupted the UDID of a disk, which made diskgroup imports fail.
1534038	Fixed an issue in which DMP stats sometimes used invalid I/O stats entries, which led to a panic on the host.
1534379	Fixed an issue in which the vxdg split command failed with the following error: Internal configuration daemon error
1543803	Fixed an issue in which the vxconvertcommand failed to convert a volume group.
1544051	Fixed an issue in which the incorrect bit was being checked for an EMC Symmetrix thin device.
1586879	Improved performance of the vxdisk online command when used on large configurations.

Table 1-5 Veritas Volume Manager and Veritas Volume Replicator 5.0 MP3 RP2 fixed issues (*continued*)

Incident	Description
1589022	Fixed the cause of an infinite loop in the DMP error handling code path with a CLARIION array, which led to an I/O hang.
1589172	Fixed an issue in which the vxdisksetup and vxdiskunsetup commands sometimes failed for EFI disks.
1589881	Fixed an issue in which the dump device was changed to none (dumps disabled) after encapsulating a boot disk.
1590314	The vxdmadm getsubpaths dmpnodename command now validates the dmpnodenamevalue before getting the subpath information.
1594325	Backed out *unit_io and *pref_io changes that were made in the 5.0 release.
1596811	Improved performance when re-enabling individual paths.
1597868	Fixed an issue in which, on a secondary node, rlink paused and generated the “Incorrect magic number or unexpected upid” error message, and the secondary_log_err flag got set.
1598145	Fixed the cause of a crash in the vxdmproot install command during startup on an AIX 5.3 SAN boot disk.
1598706	Fixed the cause of a system crash that occurred while mirroring the rootdisk.
1661938	Enhanced the vxconfigd daemon to take advantage of the AIX very large address space model.
1663338	Fixed an issue in which I/O load balancing to LUNs between two VIO servers not working.
1675221	Fixed an issue in which the vxdmadm setattr enclosure command created identical disk attribute names.
1677416	Fixed some CVM join and takeover issues that occurred in shared Active/Passive storage configurations that were due CVM sending messages that were more than 64k in size.
1711339	VVR tunables can now be modified using the vxtune command.
1714619	Fixed the cause of the panic due to DMP calling iodone() twice.

Veritas File System fixed issues

The Storage Foundation 5.1 includes cumulative fixes for Veritas File System since the 5.0MP3 release. The following tables describe these fixed issues.

[Table 1-6](#) describes fixed issues in the Veritas File System 5.1 release.

Table 1-6 Veritas File System 5.1 fixed issues

Incident	Description
1477763	The <code>qiostat -l</code> command now shows accurate hit percentages.
1603264	Fixed a panic that occurred while removing Storage Checkpoints, which requires a very long full <code>fsck</code> .
1744587	Fixed a mount failure that occurred while mounting file systems that are greater than 10 TB.
1745875	Fixed a hang issue with the <code>fsckptadm create</code> command.
1804512	Fixed a <code>umount</code> failure that returned EBUSY.

[Table 1-7](#) describes fixed issues in the Veritas File System 5.0 MP3 RP2 release.

Table 1-7 Veritas File System 5.0 MP3 RP2 fixed issues

Incident	Description
847454	The VxFS <code>cp</code> command now has similar performance as the JFS2 <code>cp</code> command.
1298054	Fixed an issue in which ODM randomly displayed the following error: ORA-17500: ODM err:ODM ERROR V-41-4-2-42-11 Resource temporarily unavailable
1299313	Fixed the cause of a panic in <code>vx_unlockmap()</code> due to a null <code>ml_tranp</code> pointer.
1317905	Fixed the cause of a core dump when running the <code>quotacheck</code> command with more than 30 quota-enabled file systems in the <code>/etc/fstab</code> file.
1363639	Fixed the cause of an exception in the <code>vx_vnmap_min()</code> call that was due to the <code>vx_fsext_info()</code> call of a force unmounted file system having a null <code>fse_fsext_info</code> pointer.

Table 1-7 Veritas File System 5.0 MP3 RP2 fixed issues (*continued*)

Incident	Description
1387074	Fixed the cause of the <code>fsclustadm cfsdeinit</code> command failing with the "device busy" error.
1416745	Fixed an issue in which the <code>dm_get_allocinfo()</code> call failed with the EIO error for EXT4 inodes with indirects.
1432323	Fixed a loop issue in which the <code>vx_do_putpage()</code> call due to the page going beyond <code>i_wsize</code> .
1443034	Fixed the cause of hangs with the <code>vxresize</code> and <code>fsadm -b</code> commands on a VxFS file system.
1445008	Fixed the cause of a system panic that occurred when auditing files on a VxFS file system.
1445131	Fixed a bug in the <code>vx_ifree_scan_list()</code> call in <code>vx_iflush.c</code> .
1454783	The <code>vx_multi_bufinval()</code> call now releases the CPU for a local mount with large extents.
1459329	New VxFS tunables and new <code>vxfsstat</code> counters now increase the number of VMM buffers per PDT, which improves performance.
1500197	Scanning of pages in <code>v_write</code> during <code>putpage</code> no longer causes GAB/LLT failure.
1517415	Fixed the cause of a core dump when running the <code>ncheck</code> command.
1526568	The <code>vx_tflush_map()</code> call no longer disables the file system when a map is marked bad without having an actual I/O error.
1542572	Fixed a rounding-up of length issue in the <code>vx_fsync_range()</code> call.
1591301	Fixed an issue in which a <code>smap</code> was marked bad due to punching a hole in the allocated AU.
1633530	Fixed an issue in which calling <code>vx_setext()</code> while having the <code>VX_GROWFILE</code> flag set sometimes failed to grow the file or exposed uninitialized data.
1667628	Implemented a new tunable, <code>flush_chunk_size</code> , which is used by the <code>vx_putpage_dirty()</code> and <code>vx_mm_invalidatep()</code> calls.
1701842	Fixed a cause of Concurrent I/O returning the ENOTSUP error to DB2, which caused DB2 to crash.

[Table 1-8](#) describes fixed issues in the Veritas File System 5.0 MP3 RP1 release.

Table 1-8 Veritas File System 5.0 MP3 RP1 fixed issues

Incident	Description
1366772	Fixed a performance issue.
1398904	Fixed an issue with VxFS filesystems temporarily hang in <code>vx_delay()</code> .
1400046	Fixed an issue with the <code>fsapadm enforceckpt mount_point</code> command that resulted in a core dump.
1412160	Fixed a core dump caused by a VxFS function call while setting DST attributes.
1412465	Fixed a <code>vxresize</code> command failure to resize a volume, but the command could resize the file system.
1414178	Fixed an issue with VxFS using too much CPU while looking for odd-sized extents (<code>vxi_alloc_fail</code>).
1415188	Fixed a full <code>fsck</code> core dump that was caused by running out of swap space, which resulted in a malloc failure.
1423867	Optimized <code>vx_convnode_data_files()</code> .
1487928	Fixed the build script to compile packages to enable the storage keys feature.
1517337	Fixed a panic issue with lockcount of an FS thread upon <code>thread_terminate()</code> .

Known issues

The following are known issues in this release of Storage Foundation.

See the *Veritas Cluster Server Release Notes* for VCS known issues.

Veritas Storage Foundation known issues

The following are known issues in this release of Veritas Storage Foundation.

5.1 installer does not allow direct upgrade from older version of AT to 5.1 SFHA product stacks

The 5.1 installer does not allow upgrading between products and upgrading versions in a single upgrade operation. If an older version of AT is already installed

on the systems by some other Veritas product, installing any Storage Foundation High Availability product fails with the following message:

```
The following errors were discovered on the systems:  
AT 4.x.x.x is installed. Upgrading AT 4.x.x.x directly to SF 5.1  
is not supported.  
Product Installed - Product Version - System Name  
AT                - 4.x.x.x          - d08b  
First run the install<AT> script to upgrade product to AT 5.1  
and then run install<SF>
```

Workaround

You must first upgrade AT to the latest version of AT, then you can install the desired SFHA 5.1 product. For example, to upgrade from AT 4.x to SFHA 5.1, first upgrade to AT 5.0, and then install SFHA 5.1.

To upgrade AT and SFHA products

- 1 Run the `installat` script, located under the `authentication_service` product directory in the media.
- 2 After the successful upgrade of AT, use the installer script to install the desired SFHA 5.1 product.

Veritas Storage Foundation for Databases (SFDB) tools known issues

The following are known issues with Storage Foundation for Databases (SFDB) tools.

Clone command fails on an Oracle RAC database (1399393)

The commands `dbed_vmclonedb` and `dbed_clonedb` will fail on an Oracle RAC database when the clone SID name contains the primary SID name in the beginning.

For example, the following commands, which have “Prod” as the primary SID and “Prod1” as the clone SID, produce the following error message:

```
# dbed_vmclondb -S Prod -o recoverdb \  
new_sid=Prod1,server_name=svr_name -f snapplan -r relocate_path  
# dbed_vmclondb -S Prod -o mountdb \  
new_sid=Prod1,server_name=svr_name -f snapplan -r relocate_path  
# dbed_clonedb -S Prod1 -m mount_point -c ckpt_name  
ERROR V-81-4882 An error occurred while reconfiguring Oracle instance  
'clone_SID'
```

Workaround

Do not use a clone SID name that contains primary SID name in the beginning.

Database fails over during Flashsnap operations (1469310)

In an SFHA environment, if the database fails over during Flashsnap operations such as the `dbed_vmsnap -o resync` command and various error messages appear. This issue occurs because Flashsnap commands do not create a VCS resource for the SNAP disk group. As such, when the database fails over, only the primary disk group is moved to another node.

Workaround

There is no workaround for this issue.

The error messages depend on the timing of the database failover. To fix the problem, you need to bring the FlashSnap state to SNAP_READY. Depending on the failure, you may have to use base VxVM commands to reattach mirrors. After mirrors are attached, you need to wait until the mirrors are in SNAPDONE state. Re-validate the snapplan again.

Clone command fails for instant checkpoint on Logical Standby database (1736516)

The `dbed_clonedb` command does not work on Logical standby database when using instant checkpoint.

Workaround

Clone the database using an alternate kind of checkpoint, such as the online checkpoint, which is more commonly used.

Clone command fails if archive entry is spread on multiple lines (1764885)

If you have a `log_archive_dest_1` in single line in the `init.ora` file, then `dbed_vmclonedb` will work but `dbed_vmcloneb` will fail if you put in multiple lines for `log_archive_dest_1`.

Workaround

There is no workaround for this issue.

`dbed_vmclonedb -o recoverdb` for offhost fails for Oracle 10gr2 and prior versions (1789290)

When performing an offhost clone for Oracle 10gr2 and prior versions, the clone operations fails. The failure occurs because the `user_dump_dest`, `background_dump_dest`, and `core_dump_dest` parameters are defined in the `pfile`

or `spfile` file of the primary database, but the paths specified for these parameters do not exist on the offhost machine.

Workaround

Before performing the offhost clone operation, create the directory paths on offhost machine that are specified for the `user_dump_dest`, `background_dump_dest`, and `core_dump_dest` parameters in the `pfile` or `spfile` file of the primary database.

Storage Foundation for Databases (SFDB) tools support for using Oracle Data Guard with Oracle RAC (1801265)

Storage Foundation for Databases (SFDB) tools do not support use of Data Guard with Oracle RAC in this release.

Workaround

There is no workaround for this issue.

Flashsnap reverse resync command fails on offhost flashsnap cloning (1810711)

Performing `dbed_vmsnap -o reverse_resync_begin` fails if an off-host clone has been created on the snapshot before.

Workaround

Use database checkpoints for this use case.

Reattach command fails in a multiple disk group environment if the snapshot operation fails (1840672)

In a multiple disk group environment, if the snapshot operation fails then `dbed_vmsnap` fails to reattach all the volumes. This operation must be performed as root user.

Workaround

In case the reattach operation fails, use the following steps to reattach the volumes.

To reattach volumes in a multiple disk group environment if the snapshot operation fails

- 1 Join the snapshot disk groups to primary diskgroups. The snapshot disk group name is a concatenation of “SNAPSHOT_DG_PREFIX” parameter value in snapplan and primary disk group name. Use the following command to join the disk groups:

```
# vxvg join snapshot_disk_group_name primary_disk_group_name
```

- 2 Start all the volumes in primary disk group.

```
# vxvol -g primary_disk_group_name startall
```

- 3 Reattach the snapshot volumes with primary volumes. The snapshot volume names is a concatenation of “SNAPSHOT_VOL_PREFIX” parameter value in snapplan and primary volume name. Use the following command to reattach the volumes.

```
# vxsnap -g primary_disk_group_name reattach snapshot_volume_name  
source=primary_volume_name
```

Repeat this step for all the volumes.

dbed_vmchecksnap sometimes displays error message while validating snapplan (1847850)

On some of the older AIX 6.1 TLs, such as TL1 SP2, the `dbed_vmchecksnap` command sometimes displays the following error message:

```
convert_snapplan_value[24]: test: 0403-004 Specify a parameter  
with this command.
```

Workaround

There is no workaround for this issue. You can ignore the error message since the message does not affect the functionality of the `dbed_vmchecksnap` command.

Database FlashSnap snapplan creation and validation failed for standby database if standby redo log is mislocated (1873738)

Mislocated standby redo log files may cause errors during Database FlashSnap snapplan creation and validation for standby database in a Oracle Data Guard environment.

The `dbed_vmchecksnap` command may fail with the following error messages:

```
$ dbed_vmchecksnap -S stand \  
-H $ORACLE_HOME -f snp -o setdefaults -t dblxxeon02  
SFORA vxsnapadm ERROR V-81-5907 open() /snap_data11r1/FLAS11r1/redo01.log  
    failed (No such file or directory) .  
SFORA vxsnapadm ERROR V-81-5526 Empty or open file  
    /snap_data11r1/FLAS11r1/redo01.log failed.  
Snapplan snp for stand.
```

Workaround

Create empty redo log files by using the touch command so that `dbed_vmchecksnap` can succeed without any errors.

For example:

```
$ touch /snap_data11r1/FLAS11r1/redo01.log  
$ touch /snap_data11r1/FLAS11r1/redo02.log  
$ touch /snap_data11r1/FLAS11r1/redo03.log
```

db2exp may frequently dump core (1854459)

If a host is configured to an SFM central server with DB2 version 9.x, then the command-line interface `db2exp` may frequently dump core.

Workaround

There is a hotfix patch available for this issue. Contact Symantec Technical Support for the hotfix patch.

Installer fails with a message that VRTSvlic is not installed

If you run the installer to configure, upgrade, or uninstall a cluster with three or more nodes, the installer may fail with a message that the VRTSvlic fileset is not installed. This failure occurs because of an installer timing issue. [1865116]

Workaround: You can either try to start the installer script again which resolves the timing issue or you can use the `-serial` option of the installer.

In an IPv6 environment, db2icrt and db2idrop commands return a segmentation fault error during instance creation and instance removal (1602444)

When using IBM DB2 `db2icrt` command to create a DB2 database instance on a pure IPv6 environment, the `db2icrt` command returns segmentation fault error message. For example:

```
$ /opt/ibm/db2/V9.5/instance/db2icrt -a server -u db2fen1 db2inst1
/opt/ibm/db2/V9.5/instance/db2iutil: line 4700: 26182 Segmentation fault
$ {DB2DIR?}/instance/db2isrv -addfcm -i ${INSTNAME?}
```

The `db2idrop` command also returns segmentation fault, but the instance is removed successfully after the `db2idrop` command is issued. For example:

```
$ /opt/ibm/db2/V9.5/instance/db2idrop db2inst1
/opt/ibm/db2/V9.5/instance/db2iutil: line 3599: 7350 Segmentation fault
$ {DB2DIR?}/instance/db2isrv -remove -s DB2_${INSTNAME?} 2> /dev/null

DBI1070I Program db2idrop completed successfully.
```

This happens on DB2 9.1, 9.5, and 9.7.

This issue has been identified as an IBM issue. Once IBM has fixed this issue, then IBM will provide a hotfix for this segmentation problem.

At this time, you can communicate in a dual-stack to avoid the segmentation fault error message until IBM provides a hotfix.

To communicate in a dual-stack environment

- ◆ Add an IPv6 hostname as an IPv4 loopback address to the `/etc/hosts` file. For example:

```
127.0.0.1 swlx20-v6
```

Or

```
127.0.0.1 swlx20-v6.punipv6.com
```

where `127.0.0.1` is the IPv4 loopback address.

where `swlx20-v6` and `swlx20-v6.punipv6.com` is the IPv6 hostname.

AT Server crashes when authenticating unixpwd user multiple times (1705860)

There is a known issue in the AIX kernel code that causes 'getgrent_r' function to corrupt the heap. This issue is present in AIX 5.3 and AIX 6.1 Refer to IBM's Web site for more information:

<http://www-01.ibm.com/support/docview.wss?uid=isg1IZ52585>

AT uses `getgrent_r` function to get the groups of the authenticated user.

IBM has released the fix as a patch to fileset `bos.rte.libc`. There are different patches available for different version of `bos.rte.libc`. You need to check the version

of `bos.rte.libc` (For example: `lslpp -l grep bos.rte.libc`) and apply the appropriate IBM patch:

- For version 6.1.3.1:
<http://www-01.ibm.com/support/docview.wss?uid=isg1IZ52959>
For the fix:
<ftp://ftp.software.ibm.com/aix/efixes/iz52959/>
- For version 6.1.2.4:
<http://www-01.ibm.com/support/docview.wss?uid=isg1IZ52720>
For the fix:
<ftp://ftp.software.ibm.com/aix/efixes/iz52720/>
- For version 6.1.2.5 :
<http://www-01.ibm.com/support/docview.wss?uid=isg1IZ52975>
For the fix:
<ftp://ftp.software.ibm.com/aix/efixes/iz52975/>

There are IBM patches for only certain version of `bos.rte.libc` that are available. If your system has a different `bos.rte.libc` version, you may have to upgrade to a higher version where the fix is available. If your version is not available, you may have to contact IBM.

Oracle 11gR1 may not work on pure IPv6 environment (1819585)

There is problem running Oracle 11gR1 on a pure IPv6 environment.

Running AIX 6.1, you may receive the following error message when using sqlplus:

```
$ sqlplus " / as sysdba"  
SQL> startup nomount  
SQL> ORA 0-0-0-0
```

There is no workaround for this as Oracle 11gR1 does not fully support pure IPv6 environment. Oracle 11gR2 release may work on a pure IPv6 environment, but it has not been tested or released yet.

Not all the objects are visible in the SFM GUI (1821803)

After upgrading SF stack from 5.0MP3RP2 to 5.1, the volumes are not visible under the Volumes tab and the shared diskgroup is discovered as Private and Deported under the Disgroup tab in the SFM GUI.

Workaround

To resolve this known issue

- ◆ On each manage host where VRTSsfmh 2.1 is installed, run:

```
# /opt/VRTSsfmh/adm/dclisetup.sh -U
```

An error message when you perform off-host clone for RAC and the off-host node is not part of the CVM cluster (1834860)

There is a known issue when you try to perform an off-host clone for RAC and the off-host node is not part of the CVM cluster. You may receive a similar error message:

```
Cannot open file /etc/vx/vxdba/rac11g1/.DB_NAME
(No such file or directory).
SFORA vxreptadm ERROR V-81-8847 Cannot get filename from sid
for 'rac11g1', rc=-1.
SFORA vxreptadm ERROR V-81-6550 Could not connect to repository
database.
VxVM vxdg ERROR V-5-1-582 Disk group SNAP_rac11dgl: No such disk
group SFORA
vxsnapadm ERROR V-81-5623 Could not get CVM information for
SNAP_rac11dgl.
SFORA dbed_vmclonedb ERROR V-81-5578 Import SNAP_rac11dgl failed.
```

Currently there is no workaound for this known issue. However, if the off-host node is part of the CVM cluster, then off-host clone for RAC works fine.

Also the `dbed_vmclonedb` command does not support `LOCAL_LISTENER` and `REMOTE_LISTENER` in the `init.ora` parameter file of the primary database.

DB2 databases are not visible from the SFM Web console (1850100)

If you upgraded to SF 5.1, DB2 databases will be not visible from the SFM web console.

This will be fixed in the SF 5.1 Patch 1 release.

Workaround

Reinstall is required for SFM DB2-Hotfix (HF020008500-06.sfa), if the host is upgraded to SF 5.1 Use the deployment framework and reinstall the hotfix for DB2 (HF020008500-06.sfa) on the managed host.

To resolve this issue

- 1 In the Web GUI, go to **Settings > Deployment**.
- 2 Select **HF020008500-06 hotfix**.
- 3 Click **Install**.
- 4 Check the **force** option while reinstalling the hotfix.

All the LUNS for a Storage Foundation host must be larger than 32MB (1471732)

All the LUNS presented to the host where Storage Foundation stack is installed, should be greater than 32MB in size. In case of smaller size disks are presented to host, the host may PANIC while trying to access these LUNS. One of the ways to prevent the host from PANIC on boot is to unmap or remove the small size LUNS from hosts view

A volume's placement class tags are not visible in the Veritas Enterprise Administrator GUI when creating a dynamic storage tiering placement policy (1880622)

A volume's placement class tags are not visible in the Veritas Enterprise Administrator (VEA) GUI when you are creating a dynamic storage tiering (DST) placement policy if you do not tag the volume with the placement classes prior to constructing a volume set for the volume.

Workaround

To see the placement class tags in the VEA GUI, you must tag the volumes prior to constructing the volume set. If you already constructed the volume set before tagging the volumes, restart `vxsvc` to make the tags visible in the GUI.

Veritas Volume Manager known issues

The following are known issues in this release of Veritas Volume Manager (VxVM).

The cluster may hang if a node goes down (1835718)

The cluster may hang if a node goes down while one array is disabled or offline in a mirror=enclosure configuration.

This may occur, if a node panics or loses power while one array of a mirror=enclosure configuration is offline or disabled, then the cluster, fencing, I/O loads, and VxVM transactions hang.

There is no workaround at this time.

Performing Thin Reclamation on sliced format disk causes data corruption (1834848)

This issue occurs only for the Thin Reclamation feature on a sliced format disk. When reclaiming the thin disks within the disk group, this issue occurs if the thin disks are initialized using sliced format. The `vxdisk reclaim` command or `fsadm -R` command option corrupts the data on the file system.

Workaround

Avoid performing any reclaim operation on the disk group with thin reclamation disk on it.

If performing the reclaim is required, initialize the thin reclaim disk as `cdsdisk` format.

Existing disk groups and file systems will not be affected, because the thin reclamation feature is only supported from Storage Foundation 5.0MP3 release and onwards.

The path failure due to filer panic in the netapp array may occasionally cause longer path failover time or longer I/O delay (1835139)

The path failure due to filer panic in the netapp array may occasionally cause longer path failover time or the longer I/O delay which varies from 100 seconds to 400 seconds. The long failover time is due to the race between the I/O code path and the path failover code path, which is more likely to happen with heavy I/O load.

Workaround

There is no workaround for this issue. The poor path failover time is not avoidable at this time.

The requestleave policy is not supported if disk cache objects (DCOs) or dirty region logs (DRLs) are configured (1796617)

When disk cache objects (DCOs) or dirty region logs (DRLs) are configured, the `dgfailpolicy` should not be set to `requestleave`. This release 5.1 does not support this scenario because it could result in data corruption or compromise application availability.

vxconvert failures if PowerPath disks are formatted as simple disks (857504)

If a PowerPath disk is formatted as a simple disk (a foreign device), then the `vxconvert` utility may fail during conversion of LVM to VxVM. To view the format of the disk, use the `vxdisk list` command.

This issue may also occur if the `/etc/vx/darecs` file contains an `hdiskpower` disk entry. This entry may be present if PowerPath disks were configured as foreign disks in Storage Foundation 4.0, and the entry was not changed after subsequent upgrades.

VxVM might report false serial split brain under certain scenarios (1834513)

VxVM might detect and report a false serial split brain when all the following conditions are met:

- One or more arrays that provide the shared storage for the cluster are being powered off
- At the same time when the arrays are being powered off, an operation that requires an internal transaction is initiated (such as VxVM configuration commands)

In such a scenario, disk group import will fail with a split brain error and the `vxsplitlines` output will show 0 or 1 pools.

Workaround:

To recover from this situation, run the following command:

```
/etc/vx/diag.d/vxprivutil set <device-path> ssbid=<dm id>
```

The `<dm id>`, which is also the `ssbid`, can be retrieved from the config copy by running the following command:

```
/etc/vx/diag.d/vxprivutil dumpconfig <device-path>
```

VxVM starts before OS device scan is done (1635274)

While working with some arrays, VxVM may start before all devices are scanned by the OS. This slow OS device discovery may result in malfunctioning of VM, fencing and VCS due to partial disks seen by VxVM.

Workaround

After the fabric discovery is finished, issue the `vxdisk scandisks` command to bring newly discovered devices into the VxVM configuration.

After installing Volume Manager, you may be prompted to reinstall it (1704161)

If you remove pre-5.1 Volume Manager packages and then install 5.1 Volume Manager without using the product installer, the following message is displayed:

```
The Volume Manager appears to be installed already. You should use vxdiskadm to add more disks to the system. Installation with vxinstall will attempt to reinstall the Volume Manager from the beginning. Depending upon how your system is currently configured, a reinstallation may fail and could leave your system unusable.
```

```
Are you sure you want to reinstall [y,n,q,?] (default: n)
```

Workaround

When you are prompted to reinstall, enter **y**.

Note: This message is not displayed if you install Volume Manager with the product installer.

To display localized characters on the VEA interface, you need to change your language preferences (1666997)

If you change the locale in your operating system, the Veritas Enterprise Administrator (VEA) interface displays messages half in the new language and half in the previous language.

Workaround

To correct this issue, change the language on your VEA Preferences screen.

Veritas File System known issues

The following are known issues in this release of Veritas Storage Foundation.

Possible write performance degradation with VxFS local mounts

Some applications that allocate large files without explicit preallocation may exhibit reduced performance with the VxFS 5.1 release compared to the VxFS 5.0 MP3 release due to a change in the default setting for the tunable `max_seqio_extent_size`. One such application is DB2. Hosting DB2 data on a single file system extent maximizes the potential for sequential pre-fetch processing. When DB2 detects an application performing sequential reads against

database data, DB2 begins to read ahead and pre-stage data in cache using efficient sequential physical I/Os. If a file contains many extents, then pre-fetch processing is continually interrupted, nullifying the benefits. A larger `max_seqio_extent_size` value reduces the number of extents for DB2 data when adding a data file into a tablespace without explicit preallocation.

The `max_seqio_extent_size` tunable controls the amount of space that VxFS automatically preallocates to files that are allocated by sequential writes. Prior to the 5.0 MP3 release, the default setting for this tunable was 2048 file system blocks. In the 5.0 MP3 release, the default was changed to the number of file system blocks equaling 1 GB. In the 5.1 release, the default value was restored to the original 2048 blocks.

The default value of `max_seqio_extent_size` was increased in 5.0 MP3 to increase the chance that VxFS will allocate the space for large files contiguously, which tends to reduce fragmentation and increase application performance. There are two separate benefits to having a larger `max_seqio_extent_size` value:

- Initial allocation of the file is faster, since VxFS can allocate the file in larger chunks, which is more efficient.
- Later application access to the file is also faster, since accessing less fragmented files is also more efficient.

In the 5.1 release, the default value was changed back to its earlier setting because the larger 5.0 MP3 value can lead to applications experiencing "no space left on device" (ENOSPC) errors if the file system is close to being full and all remaining space is preallocated to files. VxFS attempts to reclaim any unused preallocated space if the space is needed to satisfy other allocation requests, but the current implementation can fail to reclaim such space in some situations.

If your workload has lower performance with the VxFS 5.1 release and you believe that the above change could be the reason, you can use the `vxtunefs` command to increase this tunable to see if performance improves.

To restore the benefits of the higher tunable value

- 1 Increase the tunable back to the 5.0 MP3 value, which is 1 GB divided by the file system block size.

Increasing this tunable also increases the chance that an application may get a spurious ENOSPC error as described above, so change this tunable only for file systems that have plenty of free space.

- 2 Shut down any application that are accessing any large files that were created using the smaller tunable setting.
- 3 Copy those large files to new files, which will be allocated using the higher tunable setting.

- 4 Rename the new files back to the original names.
- 5 Restart any applications were shut down earlier.

The dynamic vmm buffer allocation feature requires certain AIX APARs to be installed (1849083)

VxFS supports the use of the dynamic vmm buffer allocation (D_REFUND) feature, which IBM added to AIX 6.1 TL2 and later releases of AIX. However, IBM fixed some issues in the D_REFUND feature through certain APARs, which you must install to use the D_REFUND feature with VxFS. The TL of the operating system determines which APAR you must install:

Operating system	Required APAR
AIX 6.1 TL2	IZ41494, which is packaged in SP3
AIX 6.1 TL3	IZ37627
AIX 6.1 TL4	IZ38189

Veritas Volume Replicator known issues

The following are known issues in this release of Veritas Volume Replicator.

A snapshot volume created on the secondary, containing a VxFS file system may not mount in read-write mode and performing a read-write mount of the VxFS file systems on the new primary after a GCO site failover may fail (1558257)

Issue 1:

When `vradmin ibc` command is used to take a snapshot of a replicated data volume containing a VxFS file system on the secondary, mounting the snapshot volume in read-write mode may fail with the following error:

```
UX:vxfs mount: ERROR: V-3-21268: /dev/vx/dsk/<dg>/<snapshot_volume>  
is corrupted. needs checking
```

This happens because the file system may not be quiesced before running the `vradmin ibc` command and therefore, the snapshot volume containing the file system may not be fully consistent.

Issue 2:

After a GCO site failover, mounting a replicated data volume containing a VxFS file system on the new primary site in read-write mode may fail with the following error:

```
UX:vxfs mount: ERROR: V-3-21268: /dev/vx/dsk/<dg>/<data_volume>  
is corrupted. needs checking
```

This usually happens because the file system was not quiesced on the original primary site prior to the GCO site failover and therefore, the file systems on the new primary site may not be fully consistent.

Workaround

For issue 1:

Run the `fsck` command on the snapshot volume on the secondary, to restore the consistency of the file system residing on the snapshot.

For example:

```
# fsck -V vxfs /dev/vx/dsk/<dg>/<snapshot_volume>
```

For issue 2:

Run the `fsck` command on the replicated data volumes on the new primary site, to restore the consistency of the file system residing on the data volume.

For example:

```
# fsck -V vxfs /dev/vx/dsk/<dg>/<data_volume>
```

Storage Foundation 5.0MP3 Rolling Patch 2 required for replication between 5.0 MP3 and 5.1 (1800600)

In order to replicate between primary sites running Storage Foundation 5.0 MP3 and secondary sites running Storage Foundation 5.1, or vice versa, you must install the Storage Foundation 5.0MP3 Rolling Patch 2 on the nodes using 5.0MP3. This patch resolves several outstanding issues for replicating between versions.

The patch is recommended for Storage Foundation, Storage Foundation Cluster File System and Storage Foundation RAC products.

In a IPv6-only environment RVG, data volumes or SRL names cannot contain a colon

Issue: After upgrading VVR to an IPv6-only environment in 5.1 release, `vradmin` commands may not work when a colon is specified in the RVG, data volume(s) and/or SRL name. It is also possible that after upgrading VVR to an IPv6-only

environment, `vradmin createpri` may dump core when provided with RVG, volume and/or SRL names containing a colon in it.

Workaround: Make sure that colons are not specified in the volume, SRL and RVG names in the VVR configuration

vradmin commands might fail on non-logowner node after logowner change (1810827)

When VVR is used for replicating shared disk groups in an SFCFS or SFRAC environment consisting of three or more nodes, a logowner change event might, in rare instances, render `vradmin` commands unusable on some or all of the cluster nodes. In such instances, the following message will appear in the "Config Errors:" section of the output of the `vradmin repstatus` and `vradmin printrvg` commands:

```
vradmind not reachable on cluster peer
```

In addition, all other `vradmin` commands (except `vradmin printvol`) will fail with the error:

```
"VxVM VVR vradmin ERROR V-5-52-488 RDS has configuration error related to t  
master and logowner."
```

This is due to a defect in the internal communication sub-system, which will be resolved in a later release.

To workaround this issue, restart `vradmind` on all the cluster nodes using the following commands:

```
# /etc/init.d/vras-vradmind.sh stop  
# /etc/init.d/vras-vradmind.sh start
```

Replication hang when VVR logowner is on CVM slave node (1807525)

When VVR is used for asynchronous replication in shared disk group environment, one of the nodes of the cluster at the primary site is chosen as the logowner. When the logowner node is on a node which is a slave node for the underlying CVM cluster, in the presence of heavy I/O from a node that is not the logowner, it is possible to get into a replication hang. This is due to an internal defect which will be fixed in later releases.

Workaround:

As a workaround, configure `RVGLogOwner` agent such that the VVR logowner will always reside on the CVM master node.

On the node where we want to switch the logowner from:

```
# vxrvrg -g dgname set logowner=off rvgname
```

On the master node.

```
# vxrvrg -g dgname set logowner=on rvgname
```

If using VEA to create an Replicated Data Set (RDS) fails, messages display corrupt strings in the Japanese locale (1726499, 1377599)

When using VEA to create an RDS fails, because the volumes do not have a DCM log on all nodes, the message window displays corrupt strings and unlocalized error messages.

No longer supported

This section describes Storage Foundation features that are not supported in this release.

The following features are not supported in this release of Storage Foundation products:

- The `seconly` feature in SFCFS
- Storage Expert
- The use of the `vxvoladm` command line utility
- Intelligent Storage Provisioning (ISP)
- When upgrading from 4.x or 5.0 SF for ORACLE (HA)/SFRAC to 5.1 SF (HA)/SFRAC, the following SFDB features will no longer be supported:
 - Oramap (`libvxoramap`) and storage mapping commands (`dbed_analyzer`, `vxstorage_stats`)
 - DBED providers (`DBEDAgent`), Java GUI, and `dbed_dbprocli`. The DBED Oracle GUI features can only be done through command lines. Database cloning, database flashsnap and DBDST scheduling features will not be supported through the GUI. You can use Veritas Storage Foundation Manager 2.1 that is a separate product, to display Oracle database information such as tablespaces, database to lun mapping, and tablespace to lun mapping.
 - `dbdst_makelbfs`, `vxdbts_fstatsummary`, `dbdst_fiostat_collector`, `vxdbts_get_datafile_stats`
 - `dbed_saveconfig`, `dbed_checkconfig`

- `dbed_ckptplan`, `dbed_ckptpolicy`
- `qio_convertdbfiles -f` option that is used to check for file fragmentation
- `dbed_scheduler`
- The `sfua_db_config` functionality has changed in 5.1. This command is no longer needed to create a SFDB repository. You can issue `dbed_update` to create a new SQLite SFDB repository. The `sfua_db_config` will be used to set user and group access to various SFDB directories instead.
- The `sfua_rept_adm` command was used in 5.0 to perform repository backup and restore. This command will be obsolete in 5.1. The `sfua_rept_util` command can be used instead to perform SQLite repository backup and restore.

When you upgrade from 4.x or 5.0 SF for DB2 (HA)/SF for Sybase (HA) to 5.1 SF (HA), you will lose all the respective SF for DB2 and SF for Sybase functionalities, but they can use the default Snapshots and Checkpoint features available with Storage Foundation. You can continue to use QIO and CIO fast I/O access with DB2 or Sybase databases.

VVR will use TCP as default protocol from next release

In Storage Foundation 5.1 and previous releases, VVR uses UDP as the default transport protocol for communicating between the primary and secondary. In future releases, the default protocol will be switched to TCP. Users will have the option to manually switch back to UDP.

Documentation

Product guides are available on the software disc in PDF format. Symantec's Veritas Storage Foundation documentation is also available on the Symantec website.

Symantec's Veritas Storage Foundation 5.1 documentation set is available at the following URL:

<http://www.symantec.com/business/support/overview.jsp?pid=15107>

Relevant component product release notes

Read the relevant component product release notes before installing any version of Veritas Storage Foundation.

The following documents are relevant component product release notes:

- *Veritas Cluster Server Release Notes* (vcs_notes.pdf)
- *Veritas Storage Foundation for Oracle RAC Release Notes* (sfrac_notes.pdf)

Storage Foundation guides

The following manuals, along with the online help, comprise the Veritas Storage Foundation documentation set:

[Table 1-9](#) describes the guides in the Veritas Storage Foundation documentation set.

Table 1-9 Guides in Veritas Storage Foundation documentation set

Guide Title	Filename
<i>Veritas Storage Foundation and High Availability Getting Started Guide</i>	getting_started.pdf
<i>Veritas Storage Foundation read me first</i>	readme_first.txt
<i>Veritas Storage Foundation Release Notes</i>	sf_notes.pdf
<i>Veritas Storage Foundation Installation Guide</i>	sf_install.pdf
<i>Veritas Storage Foundation: Storage and Availability Management for Oracle Databases</i>	sf_adv_ora.pdf
<i>Veritas Storage Foundation Advanced Features Administrator's Guide</i>	sf_advanced_admin.pdf
<i>Veritas File System Administrator's Guide</i>	vxfs_admin.pdf
<i>Veritas File System Programmer's Reference Guide</i>	vxfs_ref.pdf
<i>Veritas Volume Manager Administrator's Guide</i>	vxvm_admin.pdf
<i>Veritas Volume Manager Troubleshooting Guide</i>	vxvm_tshoot.pdf

Veritas Storage Foundation Cluster File System documentation

The following Veritas Storage Foundation Cluster File System documentation is available with all Veritas Storage Foundation HA product suites:

[Table 1-10](#) describes the Veritas Storage Foundation Cluster File System (CFS) documentation set.

Table 1-10 Guides in Veritas Storage Foundation Cluster File System documentation set

Guide Title	Filename
<i>Veritas Storage Foundation Cluster File System Release Notes</i>	sfcfs_notes.pdf
<i>Veritas Storage Foundation Cluster File System Installation Guide</i>	sfcfs_install.pdf
<i>Veritas Storage Foundation Cluster File System Administrator's Guide</i>	sfcfs_admin.pdf
<i>Veritas Storage Foundation: Storage and Availability Management for Oracle Databases</i>	sf_adv_ora.pdf
<i>Veritas Storage Foundation Advanced Features Administrator's Guide</i>	sf_advanced_admin.pdf

Veritas Cluster Server documentation

The following Veritas Cluster Server documentation is available with all Veritas Storage Foundation HA product suites:

[Table 1-11](#) describes the Veritas Cluster Server documentation set.

Table 1-11 Guides in Veritas Cluster Server documentation set

Guide Title	Filename
<i>Veritas Cluster Server Release Notes</i>	vcs_notes.pdf
<i>Veritas Cluster Server Installation Guide</i>	vcs_install.pdf
<i>Veritas Cluster Server Agent Developer's Guide</i>	vcs_agent_dev.pdf
<i>Veritas Cluster Server Bundled Agents Reference Guide</i>	vcs_bundled_agents.pdf
<i>Veritas Cluster Server Agents for Veritas Volume Replicator Configuration Guide</i>	vcs_vvr_agent.pdf
<i>VCS Enterprise Agent for Oracle Installation and Configuration Guide</i>	vcs_oracle_install.pdf
<i>VCS Enterprise Agent for DB2 Installation and Configuration Guide</i>	vcs_db2_install.pdf
<i>VCS Enterprise Agent for Sybase Installation and Configuration Guide</i>	vcs_sybase_install.pdf

Veritas Volume Replicator documentation

The following Veritas Volume Replicator documentation is available with the Veritas Volume Replicator option:

[Table 1-12](#) describes the Veritas Volume Replicator documentation set.

Table 1-12 Guides in Veritas Volume Replicator documentation set

Guide Title	Filename
<i>Veritas Volume Replicator Administrator's Guide</i>	vvr_admin.pdf
<i>Veritas Volume Replicator Planning and Tuning Guide</i>	vvr_planning.pdf
<i>Veritas Volume Replicator Advisor User's Guide</i>	vvr_advisor_users.pdf

Veritas Storage Foundation for Oracle RAC documentation

The following Storage Foundation for Oracle RAC documentation is available with all Veritas Storage Foundation HA product suites:

[Table 1-13](#) describes the Storage Foundation for Oracle RAC documentation set.

Table 1-13 Guides in Storage Foundation for Oracle RAC documentation set

Guide Title	Filename
<i>Veritas Storage Foundation™ for Oracle RAC Installation and Configuration Guide</i>	sfrac_install.pdf
<i>Veritas Storage Foundation™ for Oracle RAC Release Notes</i>	sfrac_notes.pdf
<i>Veritas Storage Foundation™ for Oracle RAC Administrator's Guide</i>	sfrac_admin.pdf
<i>Veritas Storage Foundation: Storage and Availability Management for Oracle Databases</i>	sf_adv_ora.pdf

Manual Pages

The Veritas online manual pages are installed in the `/opt/VRTS/man` directory. This directory can be added to the `MANPATH` environment variable.

If the `MANPATH` environment variable does not include `/opt/VRTS/man`, you can view the desired manual page by entering the following command:

```
# man -M /opt/VRTS/man manual_page_name
```

