

# Veritas Storage Foundation™ Release Notes

Linux

5.0



# Veritas Storage Foundation Release Notes

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Storage Foundation 5.0

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## Licensing and registration

Veritas Storage Foundation is a licensed product. See the *Veritas Storage Foundation Installation Guide* for license installation instructions.

## Technical support

For technical assistance, visit <http://support.veritas.com> and select phone or email support. Use the Knowledge Base search feature to access resources such as TechNotes, product alerts, software downloads, hardware compatibility lists, and our customer email notification service.



# Contents

Chapter 1	Veritas Storage Foundation Release Notes	
	Storage Foundation product suites .....	9
	Product descriptions .....	12
	Veritas Volume Manager .....	12
	Veritas File System .....	12
	Veritas Storage Foundation for Databases .....	12
	Veritas Volume Replicator .....	13
	Veritas Cluster Server .....	14
	New features .....	14
	Veritas Volume Manager .....	14
	Veritas File System .....	18
	Veritas Storage Foundation for Databases .....	20
	System requirements .....	22
	Supported Linux operating systems .....	22
	Memory requirements .....	23
	Supported DB2 versions .....	23
	Supported Oracle versions .....	23
	Software and hardware requirements .....	23
	VxVM licenses .....	24
	Cross-Platform Data Sharing licensing .....	24
	Upgrading VxFS disk layout Versions .....	25
	Upgrading VxVM disk group Versions .....	25
	Upgrading a High Availability cluster .....	26
	No longer supported .....	26
	Veritas File System no longer supported .....	26
	Veritas Storage Foundation for Databases no longer supported .....	27
	Fixed issues .....	27
	Veritas Volume Manager fixed issues .....	27
	Veritas File system fixed issues .....	28
	Veritas Storage Foundation for DB2 fixed issues .....	29
	Known issues .....	29
	Veritas Storage Foundation known issues .....	29
	Veritas Volume Manager known issues .....	31
	Veritas File System known issues .....	59
	Veritas Storage Foundation for Databases software issues .....	66

- Software limitations ..... 75
  - Veritas File System software limitations ..... 75
  - Veritas Storage Foundation for Databases software limitations ..... 76
- Documentation ..... 80
  - Veritas documentation disc ..... 80
  - Release Notes and installation guides ..... 80
  - Veritas Storage Foundation guides ..... 81

Appendix A    Third-party Legal Notices

# Veritas Storage Foundation Release Notes

This document provides release information about the products in the Veritas Storage Foundation 5.0 Linux product line:

- Veritas Storage Foundation (Basic, Standard, Standard HA, Enterprise, and Enterprise HA)
- Veritas Storage Foundation for DB2 (Standard, Enterprise, and HA Editions)
- Veritas Storage Foundation for Oracle (Standard, Enterprise, and HA Editions)
- Veritas Volume Manager (VxVM)
- Veritas File System (VxFS)

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**Note:** Veritas Storage Foundation QuickStart is not available in this release.

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Each of these Symantec products is activated by a single license key. You must obtain a license key before installing the product. For information on obtaining a license key, see the *Veritas Storage Foundation Installation Guide*.

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**Note:** For the latest information on updates, patches, and software issues regarding this release, see the following TechNote on the Symantec Technical Support website:

<http://support.veritas.com/docs/277033>

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

This document does not contain release information for Veritas Volume Replicator (VVR) or Veritas Cluster Server (VCS).

See the *Veritas Volume Replicator Release Notes*.

See the *Veritas Cluster Server Release Notes*.

## Storage Foundation product suites

The following table lists the Veritas products and optionally licensed features available with each Storage Foundation product suite.

Storage Foundation Version	Products and Features
Storage Foundation Basic	Veritas Volume Manager Veritas File System
Storage Foundation Standard	Veritas Volume Manager Veritas File System <b>Optionally licensed features:</b> Veritas Volume Replicator Option
Storage Foundation Standard HA	Veritas Volume Manager Veritas File System Veritas Cluster Server <b>Optionally licensed features:</b> Veritas Volume Replicator Option
Storage Foundation Enterprise	Veritas Volume Manager Veritas File System <b>Optionally licensed features:</b> Veritas Volume Replicator Option
Storage Foundation Enterprise HA	Veritas Volume Manager Veritas File System Veritas Cluster Server <b>Optionally licensed features:</b> Veritas Volume Replicator Option
Storage Foundation for DB2 Standard	Veritas Storage Foundation for DB2 Veritas Volume Manager Veritas File System Veritas Concurrent I/O

Storage Foundation Version	Products and Features
Storage Foundation for DB2 Enterprise	Veritas Storage Foundation for DB2 Veritas Volume Manager Veritas File System Veritas Concurrent I/O Veritas Storage Checkpoint Option Veritas Storage Mapping Option <b>Optionally licensed features:</b> Veritas Volume Replicator Option
Storage Foundation for DB2 Enterprise HA	Veritas Storage Foundation for DB2 Veritas Volume Manager Veritas File System Veritas Cluster Server Veritas Concurrent I/O Veritas Storage Checkpoint Option Veritas Storage Mapping Option <b>Optionally licensed features:</b> Veritas Volume Replicator Option
Storage Foundation for Oracle Standard	Veritas Storage Foundation for Oracle Veritas Volume Manager Veritas File System Veritas Extension for Oracle Disk Manager Option
Storage Foundation for Oracle Enterprise	Veritas Storage Foundation for Oracle Veritas Volume Manager Veritas File System Veritas FlashSnap Option Veritas Extension for Oracle Disk Manager Option Veritas Storage Checkpoint Option Veritas Storage Mapping Option <b>Optionally licensed features:</b> Veritas Volume Replicator Option

Storage Foundation Version	Products and Features
Storage Foundation for Oracle Enterprise HA	Veritas Storage Foundation for Oracle Veritas Volume Manager Veritas File System Veritas Cluster Server Veritas FlashSnap Option Veritas Extension for Oracle Disk Manager Option Veritas Storage Checkpoint Option Veritas Storage Mapping Option <b>Optionally licensed features:</b> Veritas Volume Replicator Option

## Product descriptions

### Veritas Volume Manager

Veritas Volume Manager is a storage management tool that removes the physical limitations of disk storage so that you can configure, share, manage, and optimize storage I/O performance online without interrupting data availability. VxVM also provides easy-to-use, online storage management tools to reduce planned and unplanned downtime.

### Veritas File System

Veritas File System provides high performance and online management capabilities to facilitate the creation and maintenance of file systems. File systems are a collection of directories organized into a structure that enable you to locate and store files.

The primary purposes of a file system are to:

- Provide shared access to data storage.
- Provide structured access to data.
- Control access to data.
- Provide a common, portable application interface.
- Enable the manageability of data storage.

### Veritas Storage Foundation for Databases

Veritas Storage Foundation for Oracle and Veritas Storage Foundation for DB2 combine the strengths of the core Veritas products with database-specific enhancements to offer unrivaled performance, availability, and manageability for databases. The database feature options are as follows.

#### **Veritas FlashSnap option**

The Veritas FlashSnap option, when applied to databases, lets you create, resynchronize, and reverse resynchronize volume snapshots for databases. The snapshots can be used on a second host. Also, database administrators can perform these tasks without root privileges.

This option is available with the Enterprise versions of Veritas Storage Foundation for Oracle and Veritas Storage Foundation for DB2.

## Veritas Quick I/O option

Veritas Quick I/O is a Veritas File System feature that improves the throughput for databases built on Veritas File Systems. Quick I/O delivers raw device performance to databases run on VxFS, providing the administrative advantages of using file systems without performance penalties. Veritas Cached Quick I/O further enhances database performance by leveraging large system memory to selectively buffer the frequently accessed data.

This option is available with both the Standard and Enterprise versions of Veritas Storage Foundation for Oracle and Veritas Storage Foundation for DB2.

## Veritas Extension for Oracle Disk Manager option

Veritas Extension for Oracle Disk Manager is a custom storage interface designed specifically for Oracle9i and 10g. Oracle Disk Manager improves the performance and manageability of system bandwidth through an improved API that contains advanced kernel support for file I/O.

This option is available with both the Standard and Enterprise versions of Veritas Storage Foundation for Oracle.

## Veritas Storage Checkpoint option

Veritas Storage Checkpoint technology lets you create a point-in-time image of a file system. Storage Checkpoints are treated like any other VxFS file system and can be created, mounted, unmounted, and removed.

This option is available with the Enterprise versions of Veritas Storage Foundation for Oracle and Veritas Storage Foundation for DB2.

## Veritas Storage Mapping option

Storage Mapping lets you map datafiles to physical devices and display storage object I/O statistics. Both storage object I/O statistics and the storage structure can be displayed for a specific file.

This option is available with the Enterprise versions of Veritas Storage Foundation for Oracle and Veritas Storage Foundation for DB2.

In addition, with Veritas Storage Foundation for Oracle, mapping information showing which tablespaces reside on which physical disks can be obtained for a specified database.

## Veritas Volume Replicator

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

## Veritas Cluster Server

Veritas Cluster Server provides an open systems clustering solution that eliminates both planned and unplanned downtime, facilitates server consolidation and failover, and effectively manages a wide range of applications in heterogeneous environments.

## New features

The following new features have been incorporated into Veritas Volume Manager, Veritas File System, and Veritas Storage Foundation for Databases.

### Veritas Volume Manager

This release of Veritas Volume Manager includes the following new features and enhancements.

#### Default private region size

The default size of the private region has been increased from 1 MB to 32 MB.

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**Note:** You do not need to change the private region size of existing disk groups to the new default value.

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#### Changed behavior of disk group import

In previous releases, the `vxvg import` command could not import a disk group if some disks in the disk group were unusable or inaccessible. In such cases, the `-f` option had to be specified to forcibly import the disk group. With this release, a disk group can be imported successfully if all the disks are accessible that were visible when the disk group was last imported successfully. As using the `-f` option to forcibly import an incomplete disk group counts as a successful import, the disk group can subsequently be imported without specifying this option. The changed behavior applies to both private and cluster-shared disk groups.

#### Faster startup time

The time taken to start the Veritas Volume Manager configuration daemon, `vxconfigd`, to discover new devices, to initialize dynamic multipathing, and to import disk groups has been significantly reduced.

## Faster cluster node joins

The time that nodes take to join a cluster has been reduced by allowing concurrent joins.

## Remote Mirror — robust campus cluster support

The Remote Mirror feature retains the current usage model for campus cluster support (also known as stretch cluster) where a disk group can span storage from multiple sites. Existing utilities such as `vxdg` and `vxdisk` have been enhanced to achieve data set completeness, and to maintain site consistency. The preferred read policy for mirrors has been extended so that read requests are serviced locally if possible. A mechanism is also provided to deal with disk group inconsistencies between storage at different sites (serial split-brain scenario) and to perform fire-drill testing of site failure and recovery. In this release, up to three sites are supported in a Remote Mirror configuration.

## Support for 32 cluster nodes

The clustering functionality of VxVM supports up to 32 nodes.

## SCSI 3 PR enhancement in clusters

The keys for disabled paths are removed so that node joins are not obstructed. In addition, the time taken to register keys has been reduced.

## File-level SmartSync

The SmartSync feature of VxVM has been extended to support Oracle Resilvering of files in Veritas File System.

## Enhancements to DDL and DMP

There are a number of enhancements to the Device Discovery Layer (DDL) and Dynamic Multipathing (DMP) features:

- Faster failure detection and recovery by DMP  
DMP has been enhanced to allow the `vxdmpadm` command to be used to adjust the I/O error recovery and I/O throttling mechanisms on individual paths.
- Changing DMP tunables  
The values of most DMP tunables can now be set by using the `vxdmpadm settune` command.
- Retry period for Persistent Group Reservation (PGR)

The maximum time period for which DMP retries the SCSI-3 Persistent Reserve operation with A/P arrays can now be tuned by using the `dmp_retry_timeout` parameter with the `vxddmpadm` command. The default value is 120 seconds, which is twice the value of the SCSI I/O timeout. This parameter has no direct effect on I/O processing by DMP.

Disabling a switch port can trigger a fabric reconfiguration, which can take time to stabilize. During this period, attempting to register PGR keys through the secondary path to an array may fail with an error condition, such as unit attention or device reset, or the return of vendor-specific sense data. The retry period allows a fabric reconfiguration, which is usually a transient condition, to not be seen as an error by DMP.

To display the current value of `dmp_retry_timeout`, type:

```
# vxddmpadm gettune dmp_retry_timeout
```

To change the value of `dmp_retry_timeout`, type:

```
# vxddmpadm settune dmp_retry_timeout=value
```

Do not set the value of the retry period too high. This can delay the failover process, and result in I/O sluggishness or suppression of I/O activity during the retry period.

This parameter is not documented in the *Veritas Volume Manager Administrator's Guide* or in the `vxddmpadm(1M)` manual page.

- Coexistence of DMP with third-party drivers  
Provided that a suitable array support library (ASL) is available, DMP can coexist with third-party multipathing drivers, such as EMC PowerPath.

## Linked break-off snapshot volumes

A new variant of the third-mirror break-off snapshot type are linked break-off snapshot volumes, which use the `vxsnap addmir` command to link a specially prepared volume with the data volume. The volume that is used for the snapshot is prepared in the same way as for full-sized instant snapshots. However, unlike full-sized instant snapshots, this volume can be set up in a different disk group from the data volume. This makes linked break-off snapshots especially suitable for off-host processing applications where you may want to create the snapshot on storage with different characteristics from that used for the data volumes.

If you change the size of volume, any snapshots that are currently linked are also resized in the same operation.

## Volume tags

Volumes may now be tagged with an arbitrary tag name and optional tag value. Multiple tags can be associated with a single volume. Such tags are used by features such as Remote Mirror (also known as campus cluster) and Dynamic Storage Tiering (DST).

## Disk tags

Disks may now be tagged with an arbitrary tag name and optional tag value. Multiple tags can be associated with a single disk. Such tags are used by features such as Remote Mirror, Intelligent Storage Provisioning (ISP) and importing cloned disks.

## Data migration

The `vxassist`, `vxevac` and `vxsd` commands have been enhanced to allow data to be migrated at the volume, disk or subdisk level respectively. Once the data migration is in the tentative state, it can either be committed or cancelled.

## Raw I/O access to volume components of a volume set

A mechanism is provided to allow access to the raw device nodes of the component volumes of a volume set. This is intended to allow the component volumes to be backed up and restored individually.

## Maximum number of component volumes in a volume set

The maximum number of component volumes in a volume set has been increased to 2048.

## EFI disk support

Disks with an Extensible Firmware Interface (EFI) are supported for general-purpose usage. Such disks are usually formatted with a GUID Partition Table (GPT) that supports up to 128 partitions and disk sizes greater than 2TB.

The following features are *not* supported:

- Formatting of EFI disks as Cross-platform Data Sharing (CDS) compatible disks.
- Encapsulation of EFI root disks.

## Importing cloned disks

Disks that have been duplicated outside the VxVM environment (usually using specialized hardware) are referred to as *cloned disks*. The `vxdisk` and `vxdg` commands have been enhanced to allow such cloned disks to be identified, tagged and more easily managed. For example, a subset of the disks in a disk group that are similarly tagged can be imported together in a single operation.

## ISP enhancements

The following enhancements have been made to the Intelligent Storage Provisioning (ISP) feature:

- The `vxassist` command may be used instead of the `vxvoladm` command to create ISP volumes as well as non-ISP volumes. Any `vxassist` specification attributes are converted into equivalent ISP rules.
- Creation of a large number of volumes in a single operation, and retrieval of information have been speeded up.
- Annotation of storage devices may now be performed by assigning tags and optional tag values to disks and LUNs.
- The `vxassist printrules` or `vxvoladm printrules` commands may be used to display the raw set of ISP rules that were used to allocate storage to a volume.
- A specified number of volumes with a given intent can be created at the same time.
- Additional information retrieval commands are provided to support queries such as:
  - Given a template, return all template sets that refer to that template.
  - Given a template, list all the templates on which the specified template is dependent.
- The linked break-off snapshot volume feature allows ISP feature to support fast resynchronization (FastResync) with snapshot operations such as refresh and restore.
- Migration between non-ISP and ISP volumes.
- The ISP intent version number has been increased to 30.

## Veritas File System

This release of Veritas File System includes the following new features and enhancements.

### Dynamic Storage Tiering

Dynamic Storage Tiering (DST) allows administrators of multi-volume VxFS file systems to manage the placement of files on individual volumes in a volume set by defining placement policies that control both initial file location and the circumstances under which existing files are relocated.

### Improved availability

Improved availability allows you to mount a multi-volume file system even if the component data-only volume is missing or becomes unavailable. Any I/O error on a data-only volume will not affect access to non-data-only volumes. In addition, all VxFS operations that do not access the missing data-only volume will function normally. This helps guarantee the availability of some volumes even when other volumes within the file system are not available.

### File-to-volume and volume-to-file mapping in multi-volume file system support

This release provides two new commands to support this feature:

- `fsmmap` This command reports the volume location of all data or indirect extents associated with a file in a multi-volume file system, and verifies that DST policies are working as requested.
- `fsvmap` This command determines which data file is resident on a given volume for a multi-volume file system. This command recovers only the affected files when an unprotected volume is permanently lost.

### 2K volumes in a volume set

The limit of number of volumes allowed in a volume set is now 2048, increased from 256.

### File placement policy administration

The `fsppadm` command administers the file placement policies of the DST feature, and replaces the functionality of the `fsrpadm`, `fsmove`, and `fssweep` commands.

See the `fsppadm(1M)` manual page.

### Pattern-based allocation policies

Pattern tables can be assigned to directories or file systems. A pattern table contains patterns against which a file's name and creating process' UID and GID are matched as a file is created in a specified directory. The first successful match is used to set the allocation policies of the file.

### Load balancing

An allocation policy with the `balance` allocation order can be defined and assigned to files that must have their allocations distributed at random between a set of specified volumes. The effect is that the distribution of extents between the volumes is mostly equal if none of the volumes are full or disabled.

## Large directories

Disk layout Version 7 adds supplemental indexing to directories. This indexing improves creating, removing, and looking up files in directories that contain tens of thousands of entries and more.

## Concurrent I/O mount option

The `mount` command now supports the `-o cio` option, which specifies that the file system be mounted for concurrent reads and writes. I/O on files in this file system behave as if they were accessed while the `VX_CONCURRENT` cache advisory was set on the files.

See the `mount_vxfs(1M)` manual page.

## File system reorganization prevention

Some applications may require preventing extent and log reorganization. Such applications can disable file system reorganization using the `fsadm` command by creating the `/etc/fs/vxfs/vxfs_noreorg_config` file.

See the `fsadm_vxfs(1M)` manual page.

## Veritas Storage Foundation for Databases

This release of Veritas Storage Foundation includes new features added to Veritas Storage Foundation for DB2 and new support for Veritas Storage Foundation for Oracle.

### Veritas Storage Foundation for DB2

The following features have been added to this release of Veritas Storage Foundation for DB2.

#### Support for DB2 9.1

This release of Veritas Storage Foundation *for DB2* offers support for DB2 9.1.

#### Database Dynamic Storage Tiering

Veritas Database Dynamic Storage Tiering (DBDST) enables you to manage your data so that less-frequently used data can be moved to slower, less expensive disks, allowing frequently-accessed data to be stored on the faster disks for quicker retrieval.

### GUI-based task scheduler

A task scheduler has been added to the GUI to enable easy and flexible automatic creation of storage checkpoints or snapshots, clones of them, and resynchronization of the clones to the database.

### Enhanced deep mapping

Deep mapping has been enhanced to differentiate between EMC STD and BCV mirrors for EMC arrays. Use the `vxstorage_stats` command.

### New CLI Commands

The following Veritas Storage Foundation *for DB2* commands and corresponding manual pages have been added:

Command Name	Description
<code>edgetmsg2</code>	Manages message log files. This command is not available through the GUI.

## Veritas Storage Foundation for Oracle

The new support for Veritas Storage Foundation for Oracle includes the following features.

### Veritas FlashSnap Option

The Veritas FlashSnap option, when applied to databases, lets you create, resynchronize, and reverse resynchronize volume snapshots for databases. The snapshots can be used on a second host. Also, database administrators can perform these tasks without root privileges.

This option is available with the Enterprise version of Veritas Storage Foundation *for Oracle*.

### Veritas Extension for Oracle Disk Manager Option

Veritas Extension for Oracle Disk Manager is a custom storage interface designed specifically for Oracle9i and 10g. Oracle Disk Manager improves the performance and manageability of system bandwidth through an improved API that contains advanced kernel support for file I/O.

This option is available with both the Standard and Enterprise versions of Veritas Storage Foundation *for Oracle*.

### Veritas Storage Checkpoint Option

Veritas Storage Checkpoint technology lets you create a point-in-time image of a file system. Storage Checkpoints are treated like any other VxFS file system and can be created, mounted, unmounted, and removed.

This option is available with the Enterprise version of Veritas Storage Foundation for Oracle.

### **Veritas Storage Mapping Option**

Storage Mapping lets you map datafiles to physical devices and display storage object I/O statistics. Both storage object I/O statistics and the storage structure can be displayed for a specific file. In addition, mapping information showing which tables or tablespaces reside on which physical disks can be obtained for a specified database.

This option is available with the Enterprise version of Veritas Storage Foundation for Oracle.

### **Oracle Resilvering support**

Veritas Extension for Oracle Disk Manager supports Oracle Resilvering. With Oracle Resilvering, the storage layer receives information from the Oracle database as to which regions or blocks of a mirrored datafile to resync after a system crash.

## **System requirements**

### **Supported Linux operating systems**

The Veritas 5.0 release operates on the architectures and operating systems shown below. Veritas supports only those kernel binaries distributed by Red Hat and SUSE:

- Red Hat Enterprise Linux 4 (RHEL 4) with Update 3 (2.6.9-34 kernel) on AMD Opteron or Intel Xeon EM64T (x86\_64).
- SUSE Linux Enterprise Server 9 (SLES 9) with SP3 (2.6.5-7.244, 252 kernels) on AMD Opteron or Intel Xeon EM64T (x86\_64).

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**Note:** If your system is running an older version of either Red Hat Enterprise Linux or SUSE Linux Enterprise Server, you must upgrade it before attempting to install the Veritas Storage Foundation software. Consult the Red Hat or SUSE documentation for more information on upgrading your system.

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## Supported Linux operating system updates

Veritas products will operate on subsequent kernel and patch releases provided the operating systems maintain kernel ABI (application binary interface) compatibility.

Information about the latest supported Red Hat erratas and updates and SUSE service packs is available in the following TechNote. Read this TechNote *before* installing any Veritas product.

<http://support.veritas.com/docs/281987>

## Memory requirements

A minimum of 1 GB of memory is strongly recommended.

## Supported DB2 versions

DB2 8.2, also referred to as DB2 8.1 with FixPak 7, or later is supported on the Linux operating systems listed above.

## Supported Oracle versions

Oracle versions 9.2.0.6, 10g, and 10gR2 are all supported on the Linux operating systems listed above.

### Mandatory patch required for Oracle Bug 4130116

If you are running Oracle version 9.2.0.6, you must apply the Oracle patch for Oracle Bug 4130116. Contact Oracle to obtain this patch, and for details on how to apply it.

## Software and hardware requirements

The hardware compatibility list (HCL) contains the latest information about supported hardware and software and is updated regularly.

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**Note:** Before installing or upgrading Veritas Volume Manager, review the current compatibility list to confirm the compatibility of your hardware and software.

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The HCL is available at:

<http://support.veritas.com/docs/283161>

The hardware TechNote is available at:

<http://support.veritas.com/docs/283282>

If you do not find your hardware or software listed or if you have questions about the information in the compatibility list, contact Veritas Technical Services.

## VxVM licenses

The following table shows the levels of licensing in Veritas Volume Manager and the features supported at each level:

VxVM License	Description of Supported Features
Full	Concatenation, spanning, rootability, volume resizing, multiple disk groups, co-existence with native volume manager, striping, mirroring, DRL logging for mirrors, striping plus mirroring, mirroring plus striping, RAID-5, RAID-5 logging, Smartsync, hot sparing, hot-relocation, online data migration, online relay layout, volume snapshots, volume sets, Intelligent Storage Provisioning, FastResync with Instant Snapshots, Storage Expert, Device Discovery Layer (DDL), Dynamic Multipathing (DMP), and Veritas Enterprise Administrator (VEA).
Add-on Licenses	Features that augment the Full VxVM license such as clustering functionality (cluster-shareable disk groups and shared volumes) and Veritas Volume Replicator.

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**Note:** You need a Full VxVM license to make effective use of add-on licenses to VxVM.

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To see the license features that are enabled in VxVM, enter the following command:

```
# vxdctl license
```

## Cross-Platform Data Sharing licensing

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**Note:** The Cross-Platform Data Sharing (CDS) feature is also referred to as Portable Data Containers.

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The ability to import a CDS disk group on a platform that is different from the platform on which the disk group was last imported is controlled by a CDS license. CDS licenses are included as part of the Veritas Storage Foundation license.

## Upgrading VxFS disk layout Versions

VxFS 5.0 file systems employ disk layout Version 7 by default. Veritas recommends upgrading any previously installed VxFS file system to the Version 7 disk layout to make use of the extended features available in the VxFS 5.0 release. You can do this only after installing VxFS 5.0.

Use the `vxupgrade` command to upgrade the disk layout on mounted file systems with Version 4 and 6 to Version 7.

See the `vxupgrade(1M)` manual page.

Use the `vxfsconvert` command upgrade the disk layout on unmounted file systems with versions previous to 4 to Version 7.

See the `vxfsconvert(1M)` manual page.

See the *Veritas Storage Foundation Installation Guide*.

## Upgrading VxVM disk group Versions

All disk groups have a version number associated with them. Each VxVM release supports a specific set of disk group versions and can import and perform tasks on disk groups with those versions. Some new features and tasks work only on disk groups with the current disk group version, so you need to upgrade existing disk groups before you can perform the tasks. The following table summarizes the disk group versions that correspond to each VxVM release on Linux from 3.2 to the present.

Veritas Volume Manager Release	Cluster Protocol Versions	Disk Group Version	Supported Disk Group Versions
3.5	n/a	90	90
4.0	50	110	90, 110
4.1	60	120	90, 110, 120
5.0	70	140	90, 110, 120, 140

If you want to take advantage of the new features in this release, you must upgrade the *Veritas Cluster Volume Manager* (CVM) protocol Version (70), and upgrade to the latest disk group version (140).

Use the following command to find the version of a disk group:

```
# vxdg list diskgroup
```

You can also determine the version by using the `vxprint(1M)` command with the `-l` option.

To upgrade a disk group to Version 140, use the following command:

```
# vxdg upgrade diskgroup
```

For shared disk groups, the latest disk group version is only supported by the latest cluster protocol version. To see the current cluster protocol version, type:

```
# vxdtl support
```

To upgrade the protocol version for the entire cluster, enter the following command on the master node:

```
# vxdtl upgrade
```

See the “Administering Cluster Functionality” chapter of the *Veritas Volume Manager Administrator’s Guide*.

## Upgrading a High Availability cluster

If you are upgrading an HA cluster, see the *Veritas Cluster Server Installation Guide* for information on preserving your VCS configuration across the upgrade procedure. In particular, back up configuration files, such as `main.cf` and `types.cf`, in the `/etc/VRTSvcs/conf/config` directory. If you installed any VCS agents, back up any additional configuration files in this directory, such as `Oracletypes.cf`.

## No longer supported

This release does not support 32-bit OS on Linux. It also does not support IA64.

## Veritas File System no longer supported

### VxFS disk layout Version 4

VxFS disk layout Version 4 will no longer be supported in the next major release. Maintenance patches for the 4.1 release of SFCFS will continue to support previous disk layouts. Use the `vxupgrade` or `vxfsconvert` command to upgrade to disk layout Version 6 or 7.

See the *Veritas File System Administrator’s Guide*.

### seonly mount option

The `seonly mount` option might not be supported in the next release of Veritas Storage Foundation Cluster File System.

## Veritas Storage Foundation for Databases no longer supported

### Configure arrays with `vaildiag` tool, not the GUI

Arrays can no longer be configured through the GUI. Instead, configure arrays with the `vaildiag` CLI tool. For complete details, see the *Veritas Array Integration Layer Array Configuration Guide*.

### Monitoring Agent

Veritas Storage Foundation 4.1 was the last release to support the Monitoring Agent.

### Space capacity Planning for Storage Checkpoints

Veritas Storage Foundation 4.0 was the last release to support the Veritas Space Capacity Planning utility for Storage Checkpoints in the GUI. The 4.1 release supports the Veritas Space Capacity Planning utility with the CLI only.

### Monitoring Agent

Veritas Storage Foundation 4.1 was the last release to support the Monitoring Agent.

### Space Capacity Planning utility for Storage Checkpoints

Veritas Storage Foundation 4.0 was the last release to support the Veritas Space Capacity Planning utility for Storage Checkpoints in the GUI. The 4.1 release supports the Veritas Space Capacity Planning utility with the CLI only.

## Fixed issues

### Veritas Volume Manager fixed issues

The following table contains information about fixed issues in this release of VxVM.

Incident	Description
134232	Asynchronous I/O with the character interface is supported by the 2.6 version of the Linux kernel.
137175	The <code>vxdiskadm</code> utility no longer truncates default disk names to 9 characters.

Incident	Description
140947	I/O policy settings were not persistent between reboots.
229538	Multiple enclosures of the same type generated unexpected enclosure-based names.
272263	Changing a disk's I/O policy could hang <code>vxconfigd</code> .
272309	Incomplete records in <code>/etc/vx/disk.info</code> could cause <code>vxconfigd</code> to dump core.
272891	<code>vxnotify</code> did not receive events relating to the change of controller states in DMP.
311530	Renaming an enclosure with a longer name caused <code>vxconfigd</code> to dump core.
506139	If the naming scheme was changed, the default arguments to <code>vxconfigd</code> were not preserved.

## Veritas File system fixed issues

The following table contains information about fixed issues in this release of VxFS:

Incident	Description
592952	Poor <code>fcntl()</code> performance over CFS.
511460	<code>df</code> reports wrong information on a umounted block device.
511344	<code>qiadmin</code> file settings not persistent after reboot.
598387	System panic in <code>find_exported_dentry()</code> .

## Reorganizing Extents and Mapped Files

The reorganization of structural ilist extents or mapped files no longer fail due to allocations in space being removed from the file system.

In previous releases, VxFS was unable to move structural ilist extents or mapped regular files. Higher-level operations which required this ability failed. Prior to version 4.0, this affected only the file system shrink operation; however, with the introduction of multi-volume file systems this also affected volume shrink and removal.

## Veritas Storage Foundation for DB2 fixed issues

There are no new fixed issues in this release of Veritas Storage Foundation for DB2.

## Known issues

### Veritas Storage Foundation known issues

The following sections contain information about known problems and issues in this release of Storage Foundation.

#### Software disc cannot be ejected during installation

During installation, if any of the products were configured and started, the software disc cannot be ejected. This may prevent installation from continuing in following circumstances:

- If the language pack disc needs be loaded so that the associated packages can be installed.
- A product was installed that did not require a system reboot to complete the installation.

This problem is not an issue if a product was installed or upgraded that required a system reboot to complete the installation.

#### To avoid this problem at install time

- 1 Specify the `-installonly` option to the `installer` script in addition to any other options.
- 2 Eject the software disc.
- 3 Run the `installer` script with the `-configure` option specified.

#### If a software disc cannot be ejected

- 1 Stop the event source daemon:  

```
# /usr/sbin/vxddladm stop eventsource
```
- 2 Kill the `vxcached`, `vxrelocd` and `vxnotify` processes by using the `kill -9` command with their process IDs as reported by the `ps` command.
- 3 Eject the software disc.

**4 Restart the VxVM daemon processes:**

```
# /usr/sbin/vxddladm start eventsource
# /etc/vx/bin/vxcached
# /etc/vx/bin/vxrelocd
```

[622442]

**Persistent network interface names on SUSE clusters**

On SUSE systems, network interfaces can change their names following a reboot. To configure persistent network interface names, add a `PERSISTENT_NAME=ethX` entry to the `/etc/sysconfig/network/ifcfg-eth-id-mac_address` network interface configuration file for each interface on each node of the cluster, where `X` and `mac_address` correspond to the interface number and MAC address.

**Netdump network console and crash dump facility**

For optimum performance, Veritas recommends installing and configuring `netdump` on each installation of Red Hat and SUSE.

For more information on installing `netdump` on Red Hat systems, see the Red Hat technical support website.

For more information on installing `netdump` on SUSE systems, refer to the following file:

```
/usr/share/doc/packages/lkcdutils/README.SuSE
```

**Improve performance with block size of 4K**

When using DB2 UDB with VxFS, Veritas recommends creating VxFS with a 4K block size to optimize performance. Matching VxFS block size with DB2 UDB's smallest page size is especially helpful when doing file-level direct I/O.

To create a file system with a 4K block size, use the `-o bsize=4096` option in the `mkfs` command. For example:

```
# mkfs -t vxfs -o bsize=4096 /dev/vx/rdsk/mydg/myvol /mnt
```

Because the file system block size is established only when first creating the file system, if you have an existing file system that encounters I/O performance problems, you will have to recreate the file system so that it uses the recommended 4K block size.

To see the block size of an existing file system:

```
# mkfs -t vxfs -m /dev/vx/rdsk/db2dg1/db2log
# mkfs -t vxfs -o \
  bsize=1024,version=6,inodesize=256,logsize=16384,largefiles \
  /dev/vx/rdsk/db2dg1/db2log 6291456
```

## DBMS security issue

The Symantec Shared DBMS feature creates the following configuration files:

- `/etc/vxdbms/VERITAS_DBMS3_hostname/conf/databases.conf`
- `/etc/vxdbms/VERITAS_DBMS3_hostname/conf/databases1.conf`
- `/etc/vxdbms/VERITAS_DBMS3_hostname/conf/registration.dat`

These configuration files are created or modified by `vxdbms_start_db.pl`, `vxdbms_start-server.pl`, and `vxdbms_register.pl` respectively.

The files are writable by everyone if the file mode creation mask is insufficiently restrictive. Symantec strongly recommends that you restrict the default file mode creation permissions (using the `umask` command) for root and administrator accounts to avoid a potential security issue. Specifically, change the group/world write and execute permissions in the default `umask`. At its least restrictive, the default `umask` for root should be 022. Symantec recommends setting to 077.

## Veritas Volume Manager known issues

The following sections contain information about known problems and issues in this release of VxVM.

### Installation issues

#### Veritas Volume Manager fails to start on an unsupported kernel

If you attempt to install the Veritas software on an unsupported kernel, an error such as the following is displayed:

```
ERROR: No appropriate modules found. Error in loading module
"vxvmp".
```

This message is also listed in the log file, `/etc/vx/.cpi_vm_rpm_msg`. You must upgrade your system to a supported kernel version.

#### Unencapsulating the root disk on a VxVM 4.1 MP2 system

A system's root disk is under VxVM control if the following command shows that `/dev/vx/dsk/bootdg/rootvol` is mounted as the root file system (/):

```
# df -v /
```

The root disk must be removed from VxVM control before upgrading from 4.1 to 5.0. If your system is running VxVM 4.1 MP2, the following remnants of encapsulation are still present after running the `vxunroot` command:

- Partition table entries for the private and public regions
- GRUB or LILO configuration entries for VxVM

These entries must be corrected before proceeding to upgrade the system. The following procedure describes how to unmirror and unencapsulate the root disk on a system that is running VxVM 4.1 MP2.

#### To unmirror and unencapsulate the root disk

- 5 Use the `vxplex` command to remove all the plexes of the volumes `rootvol`, `swapvol`, `usr`, `var`, `opt` and `home` that are on disks other than the root disk. For example, the following command removes the plexes `mirrootvol-01`, and `mirswapvol-01` that are configured on a disk other than the root disk:

```
# vxplex -o rm dis mirrootvol-01 mirswapvol-01
```

---

**Note:** Do not remove the plexes on the root disk that correspond to the original disk partitions.

---

- 6 Enter the following command to convert all the encapsulated volumes in the root disk back to being accessible directly through disk partitions instead of through volume devices. There must be at least one other disk in the `rootdg` disk group in addition to the root disk for `vxunroot` to succeed.

```
# /etc/vx/bin/vxunroot
```

Following the removal of encapsulation, the system is rebooted from the unencapsulated root disk.

If your system is running VxVM 4.1 MP2, you must additionally perform [step 7](#) through [step 11](#) to correct the partition table and the configuration of the boot loader.

- 7 Run the `fdisk` command on the root disk, as shown in this example:

```
# fdisk -l /dev/sda
Disk /dev/sda: 36.3 GB, 36398825472 bytes
255 heads, 63 sectors/track, 4425 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
```

Device	Boot	Start	End	Blocks	Id	System
/dev/sda1		1	13	104391	83	Linux
/dev/sda2		14	2001	15968610	83	Linux
/dev/sda3		1	4425	35543781	7e	Unknown
/dev/sda4		2002	4425	19470780	5	Extended
/dev/sda5		2002	3001	8032468+	83	Linux
/dev/sda6		3002	3003	16033+	82	Linux swap
/dev/sda7		4425	4425	1024	7f	Unknown

Partitions `/dev/sda3` and `/dev/sda7` with identifiers `7f` and `7e` correspond to the private and public regions respectively.

- 8 Run the `fdisk` command again to remove the private and public partitions, `/dev/sda3` and `/dev/sda7`.

```
# fdisk /dev/sda
```

```
The number of cylinders for this disk is set to 4425.
```

There is nothing wrong with that, but this is larger than 1024, and could in certain setups cause problems with:

- 1) software that runs at boot time (e.g., old versions of LILO)
- 2) booting and partitioning software from other OSs (e.g., DOS FDISK, OS/2 FDISK)

```
Command (m for help): d
Partition number (1-7): 3
```

```
Command (m for help): d
Partition number (1-7): 7
```

```
Command (m for help): w
The partition table has been altered!
```

Calling ioctl() to re-read partition table.

```
WARNING: Re-reading the partition table failed with error
16: Device or resource busy.
The kernel still uses the old table.
The new table will be used at the next reboot.
Syncing disks.
```

- 9 Edit the `/etc/fstab` file, and ensure that the entries for the root file system (`/`) and for other file systems on the root disk correspond to the correct disk partitions. If they do not, make any necessary changes to allow the system to boot correctly. For the example layout, no update is necessary. However, if the VxVM private region had been `/dev/sda6`, and other logical partitions followed it in the listing, the numbers of these partitions would decrease by 1. For example, `/dev/sda7` would become `/dev/sda6`, `/dev/sda8` would become `/dev/sda7`, and so on. Alternatively, you can copy `/etc/fstab.b4vxvm` back to `/etc/fstab` if you are certain that the entries are still valid.

- 10 Correct the configuration of the boot loader that is used on your system.

- ◆ For the GRUB boot loader, edit the `/boot/grub/menu.lst` file. Remove all entries between *and including* the `vxvm_root_default_START` and `vxvm_root_default_END` comment markers, as shown in this example:

```
#vxvm_root_default_START ( do not remove)
# Default menu entry number has been set to vxvm_root.
# - the vxvm_root default entry number is: 3
# - the original default entry number is: 0
# - the selected default entry number is: 0
# - the original grub configuration is in: \
/boot/grub/menu.lst.b4vxvm
default=3
#vxvm_root_default_END ( do not remove)
```

Remove all entries between *and including* the `vxvm_root_START` and `vxvm_root_END` comment markers, as shown in this example:

```
#vxvm_root_START ( do not remove)
title vxvm_root
root (hd0,0)
kernel /vmlinuz root=/dev/sda2 vga=0x314 console=tty0 \
console=ttyS0 selinux=0 resume=/dev/sda6 elevator=cfq \
showopts initrd /VxVM_initrd.img
#vxvm_root_END ( do not remove)
```

Change to the original boot kernel that was used before the root disk was encapsulated by uncommenting the line that starts `#default`:

```
color white/blue black/light-gray
#default 0
timeout 8
```

which would become:

```
color white/blue black/light-gray
default 0
timeout 8
```

Save the changes to the `/boot/grub/menu.lst` file.

Alternatively, you can copy `/boot/grub/menu.lst.b4vxvm` back to `/boot/grub/menu.lst` if you are certain that the entries are still valid.

- For the LILO boot loader, edit the `/etc/lilo.conf` file.

Remove all entries between *and including* the `vxvm_rootgeom_START` and `vxvm_rootgeom_END` comment markers, as shown in this example:

```
#vxvm_rootgeom_START ( do not remove )
#NOTE: Only vxvm_root entry will be able to boot the
# system, while your root disk is under Volume Manager.
# Also, running -R/lock/fallback options of LILO may
# render your system unbootable.
disk=/dev/vx/dsk/bootdg/rootvol
bios=0x80
sectors=63
heads=255
cylinders=4425
partition=/dev/vx/dsk/bootdg/bootvol
start=63
#vxvm_rootgeom_END ( do not remove )
```

Remove all entries between *and including* the `vxvm_root_START` and `vxvm_root_END` comment markers, as shown in this example:

```
#vxvm_root_START ( do not remove)
image=/boot/vmlinuz
label=vxvm_root
initrd=/boot/VxVM_initrd.img
read-only
append="root=/dev/sda2 vga=0x314 console=tty0 \
console=ttyS0 selinux=0 resume=/dev/sda6 elevator=cfq \
showopts"
#vxvm_root_END ( do not remove)
```

Change to the argument to the `default=` attribute from `vxvm_root` to `Linux`, as shown in this example:

```
boot=/dev/sda
default=Linux
timeout=50
```

Save the changes to the `/etc/lilo.conf` file.

Alternatively, you can copy `/etc/lilo.conf.b4vxvm` back to `/etc/lilo.conf` if you are certain that the entries are still valid.

Run the following command after updating the `/etc/lilo.conf` file:

```
# /sbin/lilo
```

**11** Reboot the system.

### Upgrading to VxVM 5.0

As this is the first release that supports AMD Opteron and Intel Xeon EM64T systems, no upgrade path is possible for those architectures. However, it is possible to deport disk groups from VxVM 3.2 and VxVM 4.0 Linux systems and to import these on a VxVM 5.0 Linux system.

### Support for hardware RAID controllers

Veritas Volume Manager 5.0 for Linux does not currently support most hardware RAID controllers unless they present SCSI device interfaces (with names of the form `/dev/sdx`). The PERC (for example, on the Dell 1650), MegaRAID (for example, on the Dell 2650), and ServeRAID (for example, on x440 systems) controllers are supported. Compaq array controllers that require the Smart2 and CCISS drivers (which present device paths such as `/dev/ida/c#d#p#` and `/dev/cciss/c#d#p#`) are supported for normal use and for rootability.

### Extensible Firmware Interface (EFI) disks

EFI disks are not supported in this release.

### Avoiding overwriting of non-boot disks

To avoid the possibility of non-boot disks that contain portions of the operating system being overwritten by the VxVM initialization routines, use `vxdiskadm` option 17 selection 2 (suppress a path from VxVM's view) to hide such disks from VxVM.

### Supported disk labels

VxVM can recognize and manipulate disks that have a `sun` or an `msdos` disk label. Root disk encapsulation is only supported for disks with `msdos` labels (see “[Rootability issues](#)” on page 37 for details). CDS initialization with the `cdsdisk` format is supported for disks with `sun` labels, but is not supported for disks with `msdos` labels.

### Disks under devfs control

Veritas Volume Manager 5.0 for Linux does not support disks under `devfs` control.

### Migration from LVM

The `vxvmconvert` utility is provided to help you migrate from Sistina LVM and LVM2 volumes to VxVM volumes. For more information, see Appendix B “Migrating from Sistina LVM to Veritas Volume Manager” in the *Veritas Volume Manager Administrator's Guide*.

The version of LVM2 that can be used with the LVM converter is 2.00.33 or later.

### Removing a disk from VxVM control

After evacuating any data, you can remove a disk from Veritas Volume Manager control by using the low-level `vxdiskunsetup` command to remove the VM metadata partition from the disk:

```
# /usr/lib/vxvm/bin/vxdiskunsetup sdX
```

---

**Caution:** This operation can result in data loss if used incorrectly. Ensure that you have evacuated or backed up any data on the disk.

---

## Rootability issues

### Default disk format

The default disk type is `auto` with `cdsdisk` format. The `cdsdisk` format is not suitable for boot disks. Such disks should instead be configured with the `sliced` format.

### Restrictions on root disk encapsulation

Note the following additional restrictions on using rootability with Linux.

- Root disk encapsulation is not supported on Intel Itanium platforms.

- 

This information updates that given in the “Administering Disks” chapter in the *Veritas Volume Manager Administrator’s Guide*.

### Root disk encapsulation using VEA

The VEA cannot be used to encapsulate the root disk. You must use a command such as `vxdiskadm` to perform this operation. [127619, 136649]

### Root disk mirroring under GRUB

Mirroring an encapsulated root disk can hang when the GRUB boot loader is used to set up a mirrored disk that is attached via an older Adaptec HBA controller, such as the Adaptec AIC 7880. If the boot partition, or the kernel and `/boot` directory on the root partition (if there is no boot partition), are physically located in the first 8GB of disk space, a suggested workaround is to disable “int13 extensions”, also known as “large disk support”, in the HBA BIOS (or possibly in the computer’s BIOS). This forces GRUB not to use LBA addressing. However, this workaround is known not to work with certain versions of the Adaptec HBA BIOS. See the GRUB documentation for more information. Alternatively, try mirroring to a disk on another type of controller or use LILO as the boot manager. [136464]

### Using multiple HBA drivers for the root device

When using an HBA for the root device that needs multiple drivers, list all the required drivers in the correct order in the appropriate dependency file.

For Red Hat, the file is `/etc/modprobe.conf`.

For SUSE, edit the `INITRD_MODULES` line in the `/etc/sysconfig/kernel` file.

For example, the driver for the Fusion MPT SCSI HBA consists of two parts, `mptscsih` and `mptbase`. On a SUSE system, only `mptscsih` is listed on the `INITRD_MODULES` line by default. Before encapsulating the root disk, an entry for `mptbase` must be added immediately before the entry for `mptscsih`. The root disk will not be encapsulated correctly, and the system will not boot unless this is done. [139173]

## Utility issues

### Global Device Naming

The Global Device Naming (GDN) option to the `vxddladm` command should only be used with the Storage Foundation Volume Server software. [608621]

### Current naming scheme

There is no option in the `vxddladm` command to display the current naming scheme. The naming scheme that is in operation can be deduced from the output to the `vxdisk list` command. [611320]

### `vxdiskadm` displays error V-5-1-9764 when excluding devices

The `vxdiskadm` operation displays error V-5-1-9764 if a vendor and product ID combination are specified to exclude devices from multipathing. This error is harmless and can be ignored. The error is not seen if controller or device names are specified instead. [587435]

### Specifying an enclosure to the `vxmpadm getportids` command

The `enclosure` attribute should be used to specify an enclosure name to the `vxmpadm getportids` command, instead of the `enclr` attribute that is shown in the *Veritas Volume Manager Administrator's Guide* and the `vxmpadm(1M)` manual page.

### Disk group is disabled if private region sizes differ

A disk group is disabled if the `vxdg init` command is used to create it from a set of disks that have pre-existing private regions that differ in size. This may occur if the disks previously belonged to disk groups in older releases of VxVM.

The workaround is to reinitialize the disks before creating the disk group (for example, by using the `vxdisk -f init` command), or to use the `vxdg adddisk` command to add the disks to the disk group after it has been created. [592180]

### Maximum size of a VxVM volume

VxVM supports volume lengths up to 256TB. However, any 32-bit legacy applications that use system calls such as `seek`, `lseek`, `read` and `write` are limited to a maximum offset that is determined by the operating system. This value is usually  $2^{31}-1$  bytes (1 byte less than 2 terabytes).

### Resizing volumes with detached remote plexes

If a volume in a Remote Mirror configuration has detached plexes at a remote site, you can use the following procedure to resize it:

- 1 Turn off the `allsites` attribute for the volume:  

```
# vxvol -g diskgroup set allsites=off volume
```
- 2 Remove the detached plexes:  

```
# vxassist -g diskgroup remove mirror volume \  
plexnames=plex1,plex2,...
```
- 3 Use the `vxresize` command to resize the volume.

When the remote site comes back up:

- 1 Replace the removed plexes using storage at the remote site:  

```
# vxassist -g diskgroup mirror volume nmirror=N \  
site:remote_site_name
```
- 2 Turn on the `allsites` attribute for the volume:  

```
# vxvol -g diskgroup set allsites=on volume
```

### NFS cannot handle minor numbers greater than 255

The NFS implementation in Linux does not support minor numbers greater than 255 (see the description of Red HAT Bugzilla Bug 143897 or SUSE Bugzilla Bug 49552 for details). As a result, volume devices with large minor numbers cannot be remotely mounted via NFS. The workaround is to use the `vxdbg` command to change the base minor number of the disk group that contains the volumes, as shown here:

```
# vxdbg -g diskgroup remminor 2
```

### Resizing layered volumes during resynchronization

Due to the current implementation to handle the resize of layered volumes, it is recommended that you do not grow or shrink layered volumes (stripe-mirror, concat-mirror, and so on) during resynchronization. This limitation does not apply to ISP layered volumes.

Internally, Veritas Volume Manager converts the layout of layered volumes and updates the configuration database before it shrinks or grows their sizes. This causes any ongoing operation, such as the resynchronization, to fail.

If the system reboots before the `grow` or `shrink` of a layered volume completes, the volume is left with an intermediate layout. In such a case, use the `vxassist convert` to restore the volume to its original layout.

After a layered volume is resized, the volume names, the plex names, and the subdisk names associated with the subvolumes, are changed.

### Interpreting output from vxassist snapprint

The output from the `vxassist snapprint` command for Persistent FastResync and Non-Persistent FastResync differs as follows:

- Persistent FastResync maintains separate tracking maps for the original volume and its snapshot volumes. The “%DIRTY” value output by `vxassist snapprint` shows information based only on what has been written to an individual volume.
- Non-Persistent FastResync keeps information about changed regions in the same map for both the original and its snapshot volumes. Even if writes are only made to the snapshot volume, `vxassist snapprint` shows the same “%DIRTY” value for the original volume.

### Unsupported utilities

The `vxdiskconfig` and `vxsparecheck` utilities are not supported on the Linux platform.

### Using vxdbg free with a non-existent disk group name

Using `vxdbg free` with a non-existent disk group name does not print an appropriate error message; it only prints a header. [11286]

### Invalid region and partition configurations

The `vxdisksetup` utility allows you to specify some region/partition configurations that are invalid. Specifically, overlapping private and public regions can be specified, but can cause failures or data corruption when the disk is actually used. You must check that the partitioning of the disk does not cause overlapping public and private partitions when the default partitioning is overridden from the command line. This problem will be addressed in a future release. [13418]

### Simultaneous creation of a mirror and a log using vxassist

The `vxassist` command does not add a mirror and a log when processing a command such as the following:

```
# vxassist mirror volume layout=log ...
```

The mirror is added, but the log is silently omitted. If a log and a mirror are to be added, add the mirror and the log in two separate `vxassist` invocations, as follows:

```
# vxassist mirror volume ...  
# vxassist addlog volume ...
```

This problem will be addressed in a future release. [13488]

### Resizing a mirrored volume with plexes of different types

Resizing a mirrored volume with plexes of different types is not supported. This is documented in the `vxassist(1M)` and `vxresize(1M)` manual pages. [45668]

### Relayout of a volume turns it into a layered volume

The `vxassist relayout` process can change a non-layered volume's layout to layered. For example, you might end up with a stripe-mirror volume instead of a mirror-stripe volume.

If the final layout is not what you intended, there are two solutions:

- If the task is not complete, stop the relayout and reverse it by using the following command:  

```
# /usr/sbin/vxrelayout -g dg_name -t task_id reverse vol_name
```
- If the task has completed, you can relayout the volume back to the original layout.

[56184]

### Specifying subdisk alignment when resizing a volume

When relayout is performed on a volume, Veritas Volume Manager does not grow subdisks such that they end on cylinder boundaries. If you subsequently increase the size of the volume, its subdisks are not grown using contiguous disk space unless you specify the attribute `layout=nodiskalign` to `vxassist`, as shown here:

```
# vxassist growby volume length layout=nodiskalign
```

---

**Note:** Specifying `layout=nodiskalign` permanently enforces this layout policy.

---

[57225]

### Unsupported input to `vxdiskadm`

The `vxdiskadm` utility does not support all as input to option 1. To obtain a list of all devices, use the `vxconfigd` command. [85344]

### Option delimiter for arguments with a leading dash

The special option “--” (two dashes) must be inserted before an argument that is not an option but that contains a leading dash. For example:

```
# vxresize -g diskgroup volume -- -size
```

[89051]

### Specifying /opt/VRTS/bin in the PATH

The path to Veritas binaries, `/opt/VRTS/bin`, should be specified at the end of the `PATH` environment variable. Otherwise, the VxFS versions of commands such as `mount` and `cp` are found instead of the standard system versions of these commands. [107758]

### Relayout fails for a volume with snapshot plexes

The `SNAPATT`, `SNAPDONE`, `SNAPTMP` or `SNAPDIS` plex states are not supported for the relayout of volume configurations such as `stripe-mirror`. Relayout of such volumes fails if any of their plexes are in these states.

**Workaround:** For a plex in the `SNAPDONE` state, change the state of the plex to `ACTIVE` before performing the relayout:

```
# vxplex [-g diskgroup] convert state=ACTIVE plexname
```

For plexes in the `SNAPATT` or `SNAPTMP` states, either allow time for them to be synchronized and placed in the `SNAPDONE` state. You can then use the `vxplex convert` command to convert them to the `ACTIVE` state. Alternatively, you can use the `vxassist snapabort` command to remove the snapshot plexes. For snapshot plexes in the `SNAPDIS` state, dissociate and remove the plex from the volume using this command:

```
# vxplex [-g diskgroup] -o rm dis plexname
```

[126930]

### Using vxvol and vxmend with layered volumes

The `vxvol` and `vxmend` commands do not handle layered volumes very well. When `vxmend` is executed on the top level volume to change the state of a volume, it is executed only on the top level volume; the change is not propagated to the lower level volumes. As a result, the volume states can become inconsistent and a subsequent `vxvol init` command might fail.

The `vxvol` command also exhibits the same problem. When a `vxvol init` command is executed on the top level volume, the change is not propagated to the volumes corresponding to its subvolumes.

**Workaround:** When executing the `vxvol` or `vxmend` command on a layered volume, first issue the command to the lower level volumes in a bottom-up fashion; then execute the command on the top-level volume.

In this example, a volume, `vol`, has two subvolumes, `vol-L01` and `vol-L02`. The state of the volumes is first set to `empty`, and then the initialization commands are executed:

```
# vxmend -o force -g mydg fix empty vol
# vxmend -o force -g mydg fix empty vol-L01
# vxmend -o force -g mydg fix empty vol-L02
# vxvol -g mydg init zero vol
# vxvol -g mydg init zero vol-L01
# vxvol -g mydg init zero vol-L02
```

[134932]

### Warning message from vxassist when creating concatenated mirror volumes

You may see the following warning message when creating a concatenated mirror (`concat-mirror`) volume with the maximum size:

```
VxVM vxassist Warning V-5-1-364 dm:volume_name: No disk space
matches specification
```

As long as the volumes have been successfully created, you can safely ignore the message. [137344]

## Device and DMP issues

### I/O is not restored on a path

If a path is re-enabled after a failback or a non-disruptive upgrade (NDU) operation, I/O may not be restored on that path. To unblock I/O on the path, run the `vxdisk scandisks` command. [617331]

### DMP obtains incorrect serial numbers

DMP cannot obtain the correct serial number for a device if its LUN serial number contains a comma (,). This problem has been seen on EMC Symmetrix arrays with more than 8096 LUNs. [611333]

### Default I/O policy

The default I/O policy for Active/Active (A/A) arrays has been changed from `balanced` to `minimumq`. The default I/O policy for Asymmetric Active/Active (A/A-A) and Active/Passive (A/P) arrays has been changed from `singleactive` to `round-robin`.

### QLogic HBA driver

The default API for the QLogic SNIA HBA that is supplied with Linux SUSE SP3 does not work correctly with DMP. You can download an updated driver from the QLogic website. [528448]

### Re-initializing disks previously under VxVM control

If disks were previously under Veritas Volume Manager control and were used on the same host system, and the proper uninstallation procedures were *not* followed, the disk groups they represent are imported automatically after installation. If you no longer want to use these disk groups, use the `destroy` option of the `vxchg(1M)` command to remove them. Alternately, you can use `vxdiskunsetup(1M)` to remove the disks from Veritas Volume Manager control.

---

**Caution:** These operations can result in data loss. Ensure that you have evacuated or backed up any data on the disks.

---

### Unsupported devices for use with CDS

Devices that do not support the SCSI `modesense` command cannot be initialized with the `cdsdisk` format. Such devices include Compaq SMART, MegaRAID and PercRAID.

### Disk space required for configuration database

Disks with insufficient space (less than 65536 disk blocks) for VxVM to allocate an on-disk configuration database copy cannot be encapsulated. The database requires at least the same space as is allocated for other disks in the same disk group. This size defaults to 65536 blocks. To work around this, relocate the data on the last partition of the disk to a volume on a different disk, and free the space by reducing the partition size to 0.

The space for this database must be allocated from the beginning or the end of the disk.

**Workaround:** There is no workaround to the problem of insufficient space on a disk to store private VxVM information. VxVM requires at least a small region of private storage (65536 blocks) for proper disk identification.

### Effect of disk errors on VxVM startup

Startup of VxVM can be severely impacted by disk errors that result in I/O operations taking a long time to fail.

### Support for RAM disks and other devices

RAM disks and other devices with a sector size greater than 512 bytes cannot be used with VxVM. [130230]

### Paths remain in disabled state

Paths that previously failed to Active/Active arrays, and which are now available again, may not be automatically re-enabled by the DMP restore daemon. Use the `vxdtl enable` command to re-enable such paths. [222849]

### Overriding dependency on VRTSvxvm for old ASL packages

ASLs from previous releases have a dependency on the `VRTSvxvm` package. In the 5.0 release, the `VRTSvxvm` package has been split into the `VRTSvxvm-common` and `VRTSvxvm-platform` packages. To avoid an error message about a dependency on the `VRTSvxvm` package, specify the `--nodeps` option to the `rpm` command when installing such ASLs.

### External disks are not visible after rebooting

If your external disks are not visible after a system reboot, it is likely that the driver for your host adapter is loaded after VxVM scans for attached storage at boot time. You are likely to experience this problem with QLogic and Emulex host adapters where the drivers are loaded by `kudzu` (on Red Hat) or `coldplug` (on SUSE) startup scripts.

Possible reasons for a host adapter to be loaded after VxVM startup include:

- The host adapter was added to a system after the operating system was installed.
- The host adapter driver was removed from the `initrd` (initial RAM disk) configuration.
- The host adapter was not detected correctly during installation.

If a host adapter driver is loaded after VxVM startup, scanning for the attached disks should make them visible to VxVM:

```
# vxdisk scandisks
```

The following command should now display the disks:

```
# vxdisk list
```

To allow VxVM to discover the attached storage at boot time, the host adapter driver must be loaded in the `initrd`. The procedures for doing this on Red Hat and SUSE systems are described below:

### To add a host adapter driver to the `initrd` on a Red Hat system:

- 1 Use the `lsmod` command to identify the drivers for your host adapters:

```
# lsmod
```

Possible drivers include `qla2200` or `qla2300` for QLogic host adapters, or `lpfcdd` for Emulex host adapters.

- 2 Edit the module configuration file, `/etc/modprobe.conf`, and add an `alias` line for the host adapter to the end of the file, as shown in this example:

```
alias eth0 tg3
alias scsi_hostadapter mptbase
alias scsi_hostadapter1 mptscsih
alias scsi_hostadapter2 HBA_driver
```

where *HBA\_driver* is the name of the host adapter driver.

- 3 If your system's root disk is encapsulated, use the following command to rebuild the `initrd` image:

```
# /usr/lib/vxvm/bin/vxinitrd /boot/VxVM_initrd.img `uname -r`
```

where the `uname -r` command is used to determine the version of the kernel for which the image is being created.

If your system's root disk is not encapsulated, use the following command to rebuild the `initrd` image:

```
# mkinitrd -f /boot/initrd-`uname -r`.img `uname -r`
```

- 4 Reboot the system:

```
# shutdown -now
```

When the system has rebooted, use the following command to check that the disks on the host adapter have been discovered by VxVM:

```
# vxdisk list
```

#### To add a host adapter driver to the `initrd` on a SUSE system:

- 1 Use the `lsmod` command to identify the drivers for your host adapters:

```
# lsmod
```

Possible drivers include `qla2200` or `qla2300` for QLogic host adapters, or `lpfcdd` for Emulex host adapters.

- 2 Edit the kernel configuration file, `/etc/sysconf/kernel`, and add the name of the host adapter driver to the list defined for the `INITRD_MODULES` parameter, as shown in this example:

```
INITRD_MODULES="aacraid HBA_driver reiserfs"
```

where *HBA\_driver* is the name of the host adapter driver.

The name of the host adapter driver must come after the name of the driver that is used by the system's internal disks (`aacraid` in this example).

- 3 If your system's root disk is encapsulated, use the following command to rebuild the `initrd` image:

```
# /usr/lib/vxvm/bin/vxinitrd /boot/VxVM_initrd.img `uname -r`
```

where the `uname -r` command is used to determine the version of the kernel for which the image is being created.

If your system's root disk is not encapsulated, use the following command to rebuild the `initrd` image:

```
# mkinitrd
```

- 4 Reboot the system:

```
# shutdown -now
```

When the system has rebooted, use the following command to check that the disks on the host adapter have been discovered by VxVM:

```
# vxdisk list
```

### Sporadic DMP error messages

Error messages such as the following may be displayed on the console when two or more paths are under heavy load:

```
SCSI error : <1 0 0 3> return code = 0x20000  
end_request: I/O error, dev sdr, sector 126320  
end_request: I/O error, dev sdr, sector 126328
```

The messages occur because DMP sets the FAILFAST flag on I/O requests. The Linux kernel is prevented from retrying an I/O request after it is delayed by a fabric event, and as a consequence, it reports this as a SCSI error. Such error messages can be ignored as this is the expected behavior, and DMP retries the I/O request on behalf of the kernel. [315361]

## Hot-relocation issues

### Hot-Relocation of volumes on an encapsulated root disk

Hot-relocation of volumes is not supported for an encapsulated root disk or its mirrors.

### Data layout and performance after relocation

Hot-relocation does not guarantee the same layout of data or performance after relocation. It is therefore possible that a single subdisk that existed before relocation may be split into two or more subdisks on separate disks after relocation (if there is not enough contiguous space on a single disk to accommodate that subdisk). [14894]

### Notification of disk information on disk failure

When a disk failure occurs, the hot-relocation feature notifies the system administrator of the failure and any relocation attempts through electronic mail messages. These messages typically include information about the device offset and disk access name affected by the failure. However, if a disk fails completely or a disk is turned off, the disk access name and device offset information is not included in the mail messages. This is because VxVM no longer has access to this information. [14895]

## Cluster Functionality Issues

### Node rejoin causes I/O failures with A/PF arrays

A cluster node should not be rejoined to a cluster if both the primary and secondary paths are enabled to an A/PF array, but all the other nodes are using only the secondary paths. This is because the joining node does not have any knowledge of the cluster configuration before the join takes place, and it attempts to use the primary path for I/O. As a result, the other cluster nodes can experience I/O failures and leave the cluster.

#### Workaround:

- 1 Before joining the node to the cluster, disconnect the cable that corresponds to the primary path between the node and the A/PF array.
- 2 Check that the node has joined the cluster by using the following command:

```
# vxclustadm nidmap
```

The output from this command should show an entry for the node.

- 3 Reconnect the cable that corresponds to the primary path between the node and the array.
- 4 Use the following command to trigger cluster-wide failback:

```
# vxdisk scandisks
```

All the nodes should now be using the primary path.

[579536]

### Volume persists in SYNC state

If a node leaves the cluster while a plex is being attached to a volume, the volume can remain in the SYNC state indefinitely. To avoid this, after the plex attach completes, resynchronize the volume manually with the following command:

```
# vxvol -f resync volume
```

[20448]

### Support for RAID-5 Volumes in cluster-shareable disk groups

VxVM does not currently support RAID-5 volumes in cluster-shareable disk groups. Creating or using RAID-5 volumes on shared disks may cause a system panic.

### File systems supported in cluster-shareable disk groups

The use of file systems other than Veritas Storage Foundation Cluster File System (SFCFS) on volumes in cluster-shareable disk groups can cause system deadlocks.

### Reliability of information about cluster-shareable disk groups

If the `vxconfigd` program is stopped on both the master and slave nodes and then restarted on the slaves first, VxVM output and VEA displays are not reliable until the `vxconfigd` program is started on the master and the slave is reconnected (which can take about 30 seconds). In particular, shared disk groups are marked “disabled” and no information about them is available during this time. The `vxconfigd` program must first be started on the master.

### Error message when a node attempts to rejoin a cluster

When a node terminates from the cluster, open volume devices in shared disk groups on which I/O is not active are not removed until the volumes are closed. If this node later joins the cluster as the master while these volumes are still open, the presence of these volumes does not cause a problem. However, if the node tries to rejoin the cluster as a slave, this can fail with the following error message:

```
VxVM vxconfigd WARNING V-5-1-3031 Cannot assign minor number
```

This message is accompanied by the console message:

```
VxVM vxconfigd WARNING V-5-2192 minor number ### disk group  
group in use
```

### Volume remains in SYNC state when a node leaves a cluster

If a node leaves the cluster while a plex is being attached to a volume, the volume can remain in the SYNC state indefinitely. To avoid this, after the plex attachment completes, resynchronize the volume manually using the following command

```
# vxvol -f resync volume
```

[20448]

## Remote Mirror issues

### Volume relayout

Volume relayout is not supported for site-confined volumes or for site-consistent volumes in this release. [528677]

### Setting site consistency on a volume

The `vxvol` command cannot be used to set site consistency on a volume unless sites and site consistency have first been set up for the disk group. [530484]

### Adding a remote mirror

Adding a remote mirror to a new site for a site-consistent volume does not also create a DRL log plex or a DCO plex at that site. The workaround is to use the `vxassist addlog` command to add a DRL log plex, or the `vxsnap` command to add a version 20 DCO plex at the specified site (`site=sitename`). [533208]

### Replacing a failed disk

It is not possible to replace a failed disk while its site is detached. You must first reattach the site and recover the disk group by running these commands:

```
# vxdg -g diskgroup reattachsite sitename
# vxrecover -g diskgroup
```

The `vxdiskadm` command gives an error when replacing disk on which the `site` tag had been set. Before replacing such a failed disk, use the following commands to set the correct site name on the replacement disk:

```
# vxdisk -f init disk
# vxdisk settag disk site=sitename
```

[536853, 536881]

### Reattaching a site

Reattaching a site when the disks are in the serial-split brain condition gives an error message similar to the following if the `-o overridesb` option is not specified:

```
VxVM vxdg ERROR V-5-1-10127 disassociating sitename: Record not
in disk group
```

Use the following commands to reattach the site and recover the disk group:

```
# vxdg -g diskgroup -o overridesb reattachsite sitename
# vxrecover -g diskgroup
```

[540351]

### Site records are not propagated during disk group split, move or join

Split, join and move operations fail on a source disk group that has any site-confined volumes. This is because site records cannot be propagated to a target disk group during such operations.

One of the following messages is displayed as a result of a failed disk group split, join or move operation:

```
There are volume(s) with allsites flag which do not have a plex
on site sitename. Use -f flag to move all such the volumes
turning off allsites flag on them.
```

The volume(s) with `allsites` flags are being moved to the target disk group that doesn't have any site records. Use `-f` flag to add all such volumes turning off `allsites` flag on them.

The suggested workaround is to ensure that `allsites=off` is set on all the volumes that are being moved between disk groups:

- 1 Run the following command on each of the volumes that is being moved split or joined to find out if `allsites=on` is set on any of them.  

```
# vxprint -g diskgroup -F %allsites volume
```
- 2 Run the following command on each of the volumes with `allsites=on` set that you found in the previous step.  

```
# vxvol -g diskgroup set allsites=off volume
```
- 3 Proceed with the disk group split, join or move operation.

[563524]

### Restoring site records

The `vxmake` command can be used to recreate a disk group configuration, but not to restore site records. After restoring a disk group configuration, use the following command to recreate the site records manually:

```
# vxdg -g diskgroup addsite site
```

[584200]

## Snapshot Issues

### Cache volumes in volume sets

Do not add cache volumes (used by space-optimized instant snapshots) to volume sets. This causes data corruption and system panics.

[614061, 614787]

### Space-optimized instant snapshots of large volumes

With the default size of the paging module (1.5MB), the creation of a space-optimized instant snapshot of a volume that is larger than 252MB fails. The workaround is to use the `vxtune` command to increase the amount of memory that is available to the paging module as shown here:

```
# vxtune volpagemod_max_memsz size
```

The value that should be used for `size` is determined by the region size and the number of volumes for which space-optimized instant snapshots are taken:

$$size\_in\_KB = 6 * (total\_volume\_size\_in\_GB) * (64/region\_size\_in\_KB)$$

For example, a single 1TB volume requires around 6MB of paging memory if the region size is 64KB. If there were 10 such volumes, 60MB of paging memory would be required. [533799]

### Mount operation can cause inconsistencies in snapshots

Inconsistencies can arise in point-in-time copies if any of the following snapshot operations are performed on a volume while a file system in the volume is being mounted: `vxassist snapshot`, `vxplex snapshot`, `vxsnap make`, `vxsnap refresh`, or `vxsnap restore`.

### Using snapshots as root disks

It is recommended that you do not use snapshots of the root volume as a bootable volume. (A snapshot can be taken to preserve the data of the root volume, but the snapshot will not be bootable. The data from the snapshot would have to be restored to the original root volume before the system could be booted with the preserved data.)

### Warning message when taking a snapshot of an SFCFS file system

When taking a snapshot of a volume containing an SFCFS file system, the following warning message may appear:

```
Plex plex detached from volume vol
```

**Workaround:** No action is required. This behavior is normal and is *not* the result of an error condition.

### File system check of a snapshot

Normally, a file system would have no work to do when a snapshot is taken. However, if an SFCFS file system is not mounted, it is likely that the `fsck` of the snapshot will take longer than is usually necessary, depending on the I/O activity at the time of the snapshot.

**Workaround:** When taking a snapshot of an SFCFS file system, you should ensure that at least one of the volumes defined in the command line is mounted on the cluster master.

## Intelligent storage provisioning issues

### Number of columns in a RAID-5 ISP volume

If an ISP volume is created with the RAID-5 capability, the parameters `ncols` and `nmaxcols` refer only to the number of data columns, and do not include the parity column. For this reason, the actual number of columns that are created in such a volume is always one more than the number specified.

### Creating application volumes

To create application volumes successfully, the appropriate licenses must be present on your system. Vendors of disk arrays may also provide capabilities that require special licenses for certain features of their hardware.

[137185]

## Miscellaneous issues

### Disks with write-back caches

Disk drives configured to use a write-back cache, or disk arrays configured with volatile write-back cache, exhibit data integrity problems. The problems occur after a power failure, SCSI bus reset, or other event in which the disk has cached data, but has not yet written it to non-volatile storage. Contact the disk drive or disk array manufacturer to determine whether your system disk drives use a write-back cache, and if the configuration can be changed to disable write-back caching.

### man command may display garbled output on Red Hat systems

The `man` command may display manual pages with garbled characters on Red Hat systems. To correct the problem, set the value of the `LC_ALL` environment variable in your shell to “C” as shown in this example:

```
# LC_ALL=C
# export LC_ALL
```

See incident 82099 on the Red Hat support website for more information.

### Block 0 on a disk must not be overwritten

Since the disk label is stored in block 0 of a disk, block 0 must not be used (that is, no application should write any information in block 0). Special protection has been built into Veritas Volume Manager to protect block 0 from being overwritten.

### Auto-import of disk groups

If a disk that failed while a disk group was imported returns to life after the group has been deported, the disk group is auto-imported the next time that the system boots. This contradicts the normal rule that only disk groups that are (non-temporarily) imported at the time of a crash are auto-imported.

If it is important that a disk group *not* be auto-imported when the system is rebooted. It should be imported temporarily when the intention is to deport a disk group (for example, in HA configurations). Use the `-t` flag to `vxvg import`. [13741]

### Volumes not started following a reboot

During very fast boots on a system with many volumes, `vxconfigd` may not be able to auto-import all of the disk groups by the time `vxrecover -s` is run to start the volumes. As a result, some volumes may not be started when an application starts after reboot.

**Workaround:** Check the volumes before starting the application or place a `sleep (sleep sec)` before the last invocation of `vxrecover`. [14450]

### **Forcibly starting a volume**

The `vxrecover` command starts a volume only if it has at least one plex that is in the ACTIVE or CLEAN state and is not marked STALE, IOFAIL, REMOVED, or NODAREC. If such a plex is not found, VxVM assumes that the volume no longer contains valid up-to-date data, so the volume is not started automatically. A plex can be marked STALE or IOFAIL as a result of a disk failure or an I/O failure.

**Workaround:** Force the volume to start by entering the following command:

```
# vxvol -f start volume
```

Try to determine what caused the problem before you run this command. It is likely that the volume needs to be restored from backup, and it is also possible that the disk needs to be replaced. [14915]

## **Veritas Enterprise Administrator issues**

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**Note:** Refer to the *Veritas Storage Foundation Installation Guide* for information on how to set up and start the VEA server and client.

---

### **Controller states**

Controller states may be reported as “Not Healthy” when they are actually healthy, and “Healthy” when they are actually not healthy. [599060]

### **Remote Mirror (campus cluster)**

There is no option to create site-based snapshots. [541104]

### **Action pull-down menu items**

No Action pull-down menu items exist for the Layout View, the Disk View or the Volume View. [596284]

### **Java exception error in the Statistics View**

A Java exception error occurs in the Statistics View. [618146]

### **Out of bounds exception error**

When connecting to the central host, an “OutOfBoundsException” error occurs. [616661]

### **Volume tags not displayed**

On Microsoft Windows systems, existing volume tags are not displayed when adding a new volume tag. [602953]

### Cache volumes shown as available for volume sets

The volume set creation wizard shows cache volumes in the “Available Volumes” list. Cache volumes should not be listed as available. Including cache volumes in volume sets can cause data corruption and system panics. [614761]

### Storage Agent dumps core if there are many LUNs

Configurations with more than 10240 LUNs can cause the Storage Agent to dump core in the directory `/var/vx/isis`. [584092]

#### Workaround

- 1 Rename the Device Discovery Layer (DDL) library file:

```
# mv /opt/VRTSddlpr/lib/ddl.so /opt/VRTSddlpr/lib/ddl.so.orig
```

This prevents the DDL provider from loading, but has the effect of making enclosure, path and controller objects no longer available in the VEA client GUI.

- 2 Restart the Storage Agent:

```
# /opt/VRTSobc/pal33/bin/vxpal -a StorageAgent
```

### Minimum version of VxVM

To use the VEA client GUI to administer Veritas Volume Manager systems other than VxVM 5.0 systems on Linux, you must upgrade VxVM on the remote systems to the following releases:

Platform	Release
AIX	VxVM 3.2.2 or later
HP-UX	VxVM 3.5 Update 2 or later
Linux on x86	VxVM 3.2 Update 1 or later
Linux on IA64	VxVM 3.2 Update 6 or later
Solaris	VxVM 3.5 MP2 or later

### Minimum version of VxFS

To use the VEA client GUI to administer VxFS file systems other than VxFS 5.0 file systems on Linux, you must upgrade VxFS on the remote systems to the following releases:

Platform	Release
AIX	Any
HP-UX	VxFS 3.5 or later
Linux	Any
Solaris	VxFS 3.5 or later

### Disk group creation failure with duplicate disk ID

VEA fails to create a disk group with a duplicate disk ID, and gives no other options.

### Using the online help

Selecting a hyper link from the last item in a list of items may result in the display of text prior to the required text. It may then be necessary to scroll through the displayed help text to find the desired text.

### Starting a volume in VEA

Select **Actions > Recover Volume** to start a volume. There is no **Start Volume** action. [87907]

### Disabling wizards

In VxVM releases prior to VxVM 4.0, you could disable the wizards for certain functions by deselecting the “Enable Wizard Mode.” In this release of VxVM, you can no longer disable wizards. [135667]

### Entering comments in dialog boxes

Comments may only be entered using the ASCII character set, and not the character set that corresponds to the current locale. [147509]

### Java exceptions in the annotate disks dialog

A Java exception may occur when selecting a disk category from the **Annotate Disks** dialog. Close the exception window and ignore the error. To avoid seeing the error, first select **Tools>Refresh** to update the displayed list of objects. [229438]

## Veritas Volume Manager Web GUI issues

### Mirroring volumes across targets

Attempting to mirror volumes across targets fails. Such operations are not supported on the Linux operating system platform. [573809]

### Creating a file system on a disabled volume

Creating a file system on a disabled volume returns both success and failure messages. In fact, the operation fails. [565072]

### Maximum size of a volume

The maximum size of a volume is shown as a rounded-down integer number of gigabytes. If the maximum size is less than 1GB, the maximum size is shown as 0GB. [573897]

### Creating a volume without an existing disk group

Attempting to create a volume without an existing disk group produces the following misleading error:

```
Info V-46-1-300 No Volume available to create a file system  
[574410]
```

### Disabling paths to SENA storage arrays

Disabling a path to a SENA storage array produces the following dialog:

```
pathname is the last path to its root disk. Are you sure you want  
to disable it?  
Press Next to continue with this operation or press Cancel to  
exit this operation.
```

The message is erroneous, and it is safe to continue the operation. [575262]

### Failures when importing disk groups

Messages about failures to import disk groups are not displayed by the Web GUI. [596648]

### Failures when creating ISP volumes

Messages about failures to create ISP volumes are not displayed by the Web GUI. [601157]

### All Active Alerts View

The All Active Alerts View does not display correct information. [601167]

### Deleting an active cache volume

Attempting to delete an active cache volume fails with an error message that is incomplete. [615395]

### **Corrupted import disk group dialog**

If some objects are not present, the import disk group dialog may be displayed as blank or may show the text `<!--td align="center" height="287" valign="midd"`. For example, this can occur when attempting to import a disk group from a host that is being rebooted. [607096]

### **Initializing a disk**

At least one object must be selected in the GUI before proceeding to initialize a disk. [607026]

### **Veritas Storage Foundation Basic soft limitation messages**

Messages about exceeding the Storage Foundation Basic soft limitations are not displayed by the Web GUI. [619039]

### **Create disk group wizard**

The create disk group wizard shows internal disks as being available for the creation of shared disk groups. [574717]

### **Object not found error on creating a volume set**

An “object not found error” may be displayed when a volume set is created. [615960]

### **Java exception when deleting a volume**

Deleting a volume that has just been deleted produces a Java exception. This can happen if you do not wait for the Web page to be refreshed after the first delete operation. [608573]

### **Available controllers not shown**

The Scan Disks By Controller View does not list the available controllers. [566619]

### **Message when forcibly removing a volume from a volume set**

Forcibly removing a volume from a volume set displays a message that recommends that the **force** option be selected. [605468]

### **Java exception when removing a volume from a volume set**

Removing a volume from a volume set returns an incorrect Java exception on success. [564455]

### **Error message when removing a disk from a disk group**

Removing a disk from a disk group gives the incorrect error message “no valid disk selected.” [611894]

**Disconnecting a disk produces a ghost entry**

Ghost entries for disconnected disks in the All Disks View cannot be removed by using the GUI. A command such as `vxdg -g diskgroup rmdisk diskname` must be used instead. [576794]

**Using the “Scan disks by controller” view does not list available controllers**

When using **Scan disks by controller**, the panel of controllers is blank. [566619]

**Warning messages about exceeding SF Basic limitations are not propagated to Web GUI**

When the SF Basic limitations are exceeded, the warning message regarding this is sent to the task log, not to the GUI. This only occurs if a volume is successfully created. [619039]

## Veritas File System known issues

The following sections contain information about known problems and issues in this release of VxFS.

**Nested non-shared mount**

If you want to unmount all the file systems where the parent file system is disabled for any reason, you will need to force unmount on the parent first then by a regular unmount of the child.

**Files and directories**

To maximize VxFS performance for file systems with disk layout Version 6 or earlier, do not exceed 100,000 files in the same directory. Use multiple directories instead. This issue does not apply for disk layout Version 7, which supports large directories.

**NMI watchdog may trigger a panic**

On systems with a large number of cpus, under certain heavy filesystem load patterns it is possible for the NMI watchdog to trigger a panic due to spin lock contention. Should this condition be encountered the recommended workaround is to impose write throttling. For example:

```
# vxtunefs -o write_throttle=8192 /mnt-point
```

This issue will be fixed in the next 5.0 maintenance pack.

## **ioctls are not supported on the File Change Log file**

Ioctls are not supported on the File Change Log file. Therefore, running commands such as `fsapadm`, `setext`, `fiostat`, and `fsmap` on the FCL file is not supported since these commands use an internal ioctl to implement their functionality.

## **Commands must be large-file aware to operate correctly on file systems larger than one terabyte**

For utilities to operate correctly on large-file systems, they must be large file aware. This applies even if commands are invoked on small files in a large file system.

See the *Veritas File System Administrator's Guide*.

## **Some disk quota operations do not function on NFS**

When VxFS file systems are exported via NFS, quotas on the file system apply to users when accessing the file system from NFS clients. However, neither the Solaris nor the VxFS quota commands on the NFS client can be used to query or edit quotas. The VxFS quota commands can be used on the server to query or edit quotas.

## **100% full file system cannot be resized**

In some circumstances, the `fsadm` and `fsvoladm` commands cannot resize a 100% full file system due to lack of space for updating structural information. Check VxFS file systems on a regular basis and increase their size if they approach 100% capacity. This problem can also occur if the file system is very busy. Free up space or reduce activity on the file system and try the resize again.

## Non-standard command behavior when using access control lists

The output of the `ls -l` command on VxFS file systems shows mask/CLASS\_OBJ in place of group permissions if ACLs are in use on a file or a directory. You can determine the effective group permissions by using the `getfacl` command.

The `chmod` command changes mask/CLASS\_OBJ instead of the group permissions if ACLs are in use on a file or a directory. GROUP\_OBJ is not changed by `chmod`, and because effective group permissions are determined by GROUP\_OBJ and CLASS\_OBJ, the default group may not receive the permissions specified by `chmod`. Because `ls -l` shows mask only (which is changed by `chmod`), it only appears that the group permissions are changed as specified in `chmod`. On files with ACLs, use the command to manipulate permissions.

See the `chmod(1)`, `ls(1)`, and `umask(1)` manual pages.

## Cross-Platform Data Sharing

### ■ External quota file

CDS does not support converting the external quota file.

**Workaround:** Remove the external quota file prior to converting the file system. Convert, and then re-create the quota file on the platform.

### ■ Duration of CDS validation

CDS validation, invoked with the `fscdstask validate` command, reads the metadata of all the inodes on a disk to determine which file system entities have exceeded the limits for the specified operating systems. This can be time-consuming, and because the file system is mounted, the usages can change while validation is in progress.

### ■ Disk layout upgrades

Following a disk layout upgrade, you must unmount and re-mount the upgraded file system prior to running `fscdstask`. Otherwise you will receive an error message and the operation terminates. If this occurs, unmount, and then remount your file system.

### ■ Sharing file system quotas

Sharing file system quotas must be configured manually.

*On source:*

Prior to unmounting the file system, remove quotas and the `quotas.grp` file. Next, run `fscdsconv` after unmounting the file system.

*On target:*

First, mount the file system without quotas. Next, manually edit `quotas` and the `quotas.grp` file and enter the limits. The final step is to enable quotas.

- **Handling ACLs with CDS**  
Because not all target platforms support ACLs, converting a file system with ACLs from the source to a target on which ACLs are not supported results in ACLs not being enabled on the target. If the file system is converted back to a target on which ACLs are supported, permission checks are enforced again.

### **HSM/DMAPI not supported**

HSM/DMAPI is not supported in this release.

### **MetaDevices not supported**

MetaDevices are not supported in this release.

### **On Red Hat systems, manual pages display garbled output**

Manual pages invoked on Red Hat systems display garbled characters. To correct the problem, set the `LC_ALL` environment variable:

```
LC_ALL=C
```

See incident 82099 on the Red Hat support website for more information.

### **A VxFS File System can be corrupted if a full fsck is performed without -t vxfs**

Performing a full `fsck` without specifying the `-t vxfs` option can corrupt a VxFS file system, because the default file system type used by `fsck` is `ext2`.

### **Swap files not supported**

Swap files are not supported for VxFS on Linux. Do not create or use swap files on a VxFS file system.

### **df\_vxfs(1M) manual page installation location**

The VxFS manual pages are installed in the `/opt/VRTS/man` directory. The `df_vxfs(1M)` manual page is in the `/opt/VRTS/bin` directory. Both of these directories must be added to the `MANPATH` environment variable.

## Limitations with generic mount(8) command

There are known limitations with the handling of mount options when the mounted file system is also bound using the `--bind` option of the generic `mount(8)` command. In this case, it is not possible to change the mount options of any bound instances, and the only way to change the mount options on the original mount point is to supply both the `-t vxfs` option and the block device with the `-o remount,options` option on the command line. However, any existing mount options are reset to their default values. Subsequent attempts to change mount options on the original mount point may fail until any existing bound instances are unmounted.

## Reboot of node with VxFS File System on volume in shared disk group hangs

If a node in a cluster that has a VxFS file system on a volume in a shared disk group mounted outside of VCS control is rebooted, the reboot process hangs at `hastop` in `/etc/init.d/vcs`.

## Do not use vxassist and fsadm\_vxfs when resizing both the volume and the File System

Use the `vxresize` command when resizing both the volume and the file system. The `vxresize` command guarantees that the file system will shrink or grow along with the volume. Do not use the `vxassist` and `fsadm_vxfs` commands for this purpose.

See the `vxresize(1M)` manual page.

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

This is especially important with Linux 2.6 kernels, on which using the `vxassist` and `fsadm_vxfs` commands leaves the block device inode size in the VxFS layer incorrect.

## Virtual address Space and memory fragmentation/starvation

Regardless of a system's physical memory, the virtual address space is limited to less than 1 GB when running 32-bit Linux 2.6.x SMP kernels. This limitation is known to cause memory fragmentation and, in some cases, memory starvation. To accommodate this limitation, Symantec recommends using a `hugemem` kernel supplied by Red Hat, which increases the virtual address space to 4 GB and eases the demands on memory, such as caching file data and metadata.

## Linux I/O scheduler for database workloads

Symantec recommends using the Linux `deadline` I/O scheduler for database workloads on both Red Hat and SUSE distributions.

To configure a system to use this scheduler, include the `elevator=deadline` parameter in the boot arguments of the GRUB or LILO configuration file. The location of the appropriate configuration file depends on the system's architecture and Linux distribution:

Configuration File	Architecture and Distribution
<code>/boot/grub/menu.lst</code>	RHEL4 and SLES9 x86_64

For the GRUB configuration files (x86 and x86\_64), add the `elevator=deadline` parameter to the `kernel` command. For example, change:

```
title RHEL AS 4 smp
  root (hd1,1)
  kernel /boot/vmlinuz-2.6.9-11.ELsmp ro root=/dev/sdb2
  initrd /boot/initrd-2.6.9-11.ELsmp.img
```

To:

```
title RHEL AS 4 smp
  root (hd1,1)
  kernel /boot/vmlinuz-2.6.9-11.ELsmp ro root=/dev/sdb2
    elevator=deadline
  initrd /boot/initrd-2.6.9-11.ELsmp.img
```

A setting for the `elevator` parameter is always included by SUSE in its and GRUB configuration files. In this case, change the parameter from `elevator=cfq` to `elevator=deadline`.

Reboot the system once the appropriate file has been modified.

See the operating system documentation for more information on I/O schedulers.

## Occasional failure of a full fsck

A full `fsck` may fail to repair a file system after repairing the link count on an inode. For example:

```
# fsck -t vxfs -o full /dev/vx/dsk/testdg/vol00 fsck 1.34
(25-Jul-2003)
UX:vxfs fsck.vxfs: WARNING: V-3-20836: file system had I/O
error(s)
on meta-data.

log replay in progress
```

```
pass0 - checking structural files
.
.
.
fileset 1000 primary-ilst inode 13831 link count is 10 should
be 9
adjust? (ynq)y

file system check failure, aborting ...
```

If this occurs, restart the full `fsck` operation. The `fsck` command may need to be run several times for the repair to complete, with each instantiation repairing more of the file system.

## VxFS Web GUI online help known issues

The following known issues were reported for this release:

- For the **Mount Storage Checkpoint** operation, you must select an existing Storage Checkpoint from the drop-down list. You cannot manually enter a Storage Checkpoint name.
- The **Creating a new file system on a volume set** task can only be performed on VxFS file systems.
- For the **Remount Storage Checkpoint** operation, the **More info** link on the second wizard page does not function properly for cluster file systems.
- For the **Unmount Storage Checkpoint** operation, the **More info** link on the second wizard page does not function properly for cluster file systems.

## `fcl_keeptime` cannot be set to the default value after being modified to a non-default value

After the value for `fcl_keeptime` has been modified to a non-default value through the `vxtunefs` command, you cannot reset the value back to the default value of 0.

## Issue with full volume 0 on a multi-volume file system

Certain file system metadata that is only in the file system must be allocated from volume 0. If volume 0 is full, operations such as upgrading the file system's disk layout version and creating a Storage Checkpoint can fail. These operations can be retried after freeing space on volume 0.

### **vxfscnvert utility**

There are some conversion issues with the `vxfscnvert` utility. Symantec recommends upgrading to the 5.0RP1 patch before using `vxfscnvert`. This is more commonly seen on Linux variants.

### **du reports more blocks than an file's actual size**

The `du -k` command sometimes reports more blocks than the actual data size after a file is created. Symantec recommends using other commands, such as `vxquota -v` or `ls -ls`, to obtain accurate file size information.

## Veritas Storage Foundation for Databases software issues

### Veritas Storage Foundation for Oracle software issues

The following are known issues in this release of Veritas Storage Foundation for Oracle:

#### **dbed\_checkconfig output contains references to Quick I/O**

The output produced by the `dbed_checkconfig` command contains references to Quick I/O, which is not supported on Linux. These references can be ignored.

#### **Spaces in container path names**

This release does not support spaces in container path names. [31604]

#### **Tuning parameters lost by reverse resynchronization**

After running Database FlashSnap reverse resynchronization commands, special tuning parameters such as CQIO and vxtunefs on the primary database will be lost. They will need to be reset manually. [41898]

#### **Internet Explorer security setting required for VEA Web GUI**

The security setting in the Internet Explorer browser must be set to medium or lower in order for VEA Web GUI run properly. [223589]

#### **Removing a snapplan**

If a snapplan is in a state where `dbed_vmchecksnap -o remove` will not remove it, you can remove it by first forcing a snapshot and then resyncing. After this, use `dbed_vmchecksnap -o remove` to remove the snapplan entry from the repository. [276354]

#### **Snapplans with the same name**

If two snapplans are created with the same name but different paths, the error message `snapplan already exists` is displayed. [287057]

#### **Size of checkpoint object in the GUI**

The checkpoint object in the GUI does not show the correct size (in blocks) for the checkpoint. This size is not updated even after rescanning checkpoints in the GUI. [412038]

#### **Starting checkpoint policies from the GUI**

Checkpoint policies cannot be started from the GUI. [506088]

**Removing the SFDB repository database does not remove .odbc.ini**

Removing the SFDB repository database using the `sfua_db_config -o dropdb` command does not also remove the `/etc/vx/vxdbed/.odbc.ini` file. [534163, 611943]

Workaround: After running `sfua_db_config -o dropdb`, you can manually remove `.odbc.ini` with the `rm` command:

```
rm /etc/vx/vxdbed/.odbc.ini
```

**Cannot create an Oracle 10gR1 database on raw devices with ODM**

An Oracle 10gR1 database cannot be created through ODM on a raw device, producing an error message similar to the following:

```
ORA-00200: controlfile could not be created
```

After disabling ODM on the raw device, the database can be successfully created.

This is caused by an Oracle bug. For detailed workaround procedures, refer to the following TechNote on the Symantec Technical Support website:

<http://support.veritas.com/docs/540461.htm>

[540461]

**Unmounted checkpoint clone database reappears in the Java GUI**

An unmounted checkpoint clone database reappears in the Java GUI tree after rescanning. [567342]

**Cloning a instant checkpoint of a database using OMF controlfiles**

If an instant checkpoint is created for a database that use Oracle Managed Files (OMF) controlfiles, creating a clone with the `dbed_clonedb` command will fail with following message:

```
SFORA dbed_clonedb ERROR V-81-7052 OMF data or redo files are not supported for Instant Checkpoint clones.
```

Workaround: Either use offline or online checkpoints, or convert OMF controlfiles to ones having non-OMF names. [570250]

**SFDB commands may fail due to differing locales**

If SFDB commands are executed with a locale that differs from the locale in use when the SFDB server was started, the commands may fail with the following message:

```
([Sybase][ODBC Driver][Adaptive Server Anywhere]Syntax error ).
```

Workaround: Execute the following commands to correct this issue.

```
/opt/VRTSdbcom/bin/sfua_db_config -o stopserver  
/opt/VRTSdbcom/bin/sfua_db_config -o startserver  
/opt/VRTSdbcom/bin/sfua_db_config -o startdb
```

[582069]

### Help button in a GUI wizard produces error message

Clicking the **Help** button on a GUI wizard produces the following error message:  
Error V-39-53246-8 Get EntryPoint failed. Please check the manifest related information

Workaround: Press **OK** and ignore the error. [582416]

### sfua\_db\_config does not check if repository disk is local or shared

The `sfua_db_config` command does not check if the disk being used for the repository is a local disk or a shared disk in the case of an HA configuration. [583158]

### Archive log destination when creating an online checkpoint

Creating an online checkpoint for a database that has only `DB_RECOVERY_FILE_DEST` set as an archive log destination causes a warning message to be printed from the checkpoint creation command. The message states that a clone cannot be created from this checkpoint. If `dbed_clonedb` is subsequently run using this checkpoint, database recovery will fail with an Oracle error.

Workaround: To successfully create a clone of a database from an online checkpoint, define a mandatory archive log destination that is not `DB_RECOVERY_FILE_DEST`. [589288]

### Storage Checkpoints not supported with Database FlashSnap clones

Storage Checkpoint operations are currently not supported for databases cloned with Database FlashSnap. [600431]

### DBDST class names limited to 29 characters

The `dbdst_admin -o rmclass` command fails when attempting to remove a class name of 30 characters or more. The maximum class name length is 29 characters. [601746]

### Must run dbed\_update before starting an Oracle database from the GUI

The tablespace folder is empty when starting the Oracle database from the GUI without running `dbed_update` from the command line. Rescanning from the GUI does not solve this issue.

Workaround: Run `dbed_update` from the command line before starting an Oracle database from the GUI. [604848]

### **In Storage Foundation Oracle RAC, must run `dbed_vmchecksnap` on VCS master node**

For an SF Oracle RAC database, the `dbed_vmchecksnap` command must be run on the Veritas Cluster System master node. Also, only online snapshots are supported, which means the database instance should be up and running on the master node where validation is performed. [604855]

### **Effect of Storage Checkpoint commands delayed in SFDB GUI**

Repository changes resulting from executing SFDB Storage Checkpoint CLIs will not be reflected immediately in the SFDB GUI. The affected CLIs are `dbed_update`, `vxckpt_create`, `vxckpt_mount`, `vxckpt_umount`, and `vxckpt_remove`.

Workaround: Manually refresh from the SFDB GUI or wait for 30 minutes because the SFDB provider will automatically rescan every 30 minutes. [606994]

### **Web GUI statistic scheduler skips first statistic collection**

The Web GUI statistic scheduler uses the client timestamp instead of the server timestamp. This causes the first statistic collection to be skipped. For example, suppose the machine time is 14:00 and the client time is 13:45. If the user wants to have three samples taken starting at 13:45, with 30 minutes between each sample, only two samples will be shown: one at 14:15 and another at 14:45. [608697]

### **Cannot Refresh View Statistics wizard in Firefox browser**

When using the Web GUI with the Mozilla Firefox browser, the Refresh command in the View Statistics wizard does not work. [608697]

### **Using `dbed_vmsnap` with a non-existent snapplan**

If you specify with `dbed_vmsnap` a snapplan that does not exist, you might see the following error:

```
SFORA dbed_vmsnap ERROR V-81-6518 Could not find snapplan
'snap_plan' in repository.
/opt/VRTSdbed/bin/dbed_vmsnap[21]: test: argument expected.
```

Workaround: Correct the name of the snapplan to be one that exists and re-run the `dbed_vmsnap` command. [609682]

### **Change file permission for `admin.properties` when changing port number**

If you change the communication port number in `/etc/vx/vxdbed/admin.properties`, you must change the permission of this file to 444 by using the following command:

```
chmod 444 /etc/vx/vxdbed/admin.properties
```

[610437]

**sfua\_db\_config -o startdb does not confirm repository database started**

The `sfua_db_config -o startdb` command does not print a message to indicate whether the SFDB repository database was successfully started or not.

Workaround: Check for the success or failure by subsequently running:

```
sfua_db_config -o dbstatus
```

[613681]

**Symbolic links to Quick I/O files cause errors**

If a database contains a symbolic link to Quick I/O files, Oracle 10g produces the following error:

```
ORA-27094: raw volume can not be used
```

To avoid this error, do not use symbolic links to Quick I/O files.

This issue applies to Oracle version 10.1.0.2. It has been reported to Oracle and will be fixed in a future Oracle release. [614508]

**Do not install option 3 (Oracle RAC) without proper HA license or setup**

When installing Storage Foundation for Oracle, if you do not have the proper HA license or setup, do not choose option 3 (Storage Foundation for Oracle RAC packages) when installing with the Veritas product installer.

This does not cause the installation to fail, but doing this causes VCS/GAB error messages to be written to the system log files, which can be confusing. [614685]

**Statistic tasks via Web GUI is unsupported when connecting to a 4.1 host**

Running statistic tasks from the Web GUI is not supported when connecting to a 4.1 host. If you try to run "Create Statistic Task", you will receive the following error message:

```
Error V-40-49408-42 - An interface with the unique identifier specified does not exist for this object.
```

[615818]

**had must be running before unconfiguring SFDB repository**

To use `sfua_db_config` to unconfigure the SFDB repository in a VCS environment, make sure the `had` process is running on the system where `sfua_db_config -o unconfig_cluster` is run.

If the `had` process is not running on that system, `sfua_db_config` will not remove the repository VCS service group `Sfua_Base`. [616387]

**dbed\_vmchecksnap and dbed\_vmsnap errors on RedHat**

In an SF Oracle RAC environment on RedHat, snapplan validation succeeds but also produces the following error:

```
valid_dg_info: /opt/VRTS/bin/dbed_vmchecksnap[2011]: [: MASTER: unexpected
```

Workaround: Create a link `/usr/bin/grep` for `/bin/grep`. [620413]

**In Storage Foundation Oracle RAC, dbed\_vmclonedb -o recoverdb does not recover databases correctly**

Recovering a database with `dbed_vmclonedb -o recoverdb` produces the following error message:

```
SFORA dbed_vmclonedb ERROR V-81-4918 Database has not been correctly recovered
```

Workaround: To recover the clone database, mount the database with `dbed_vmclonedb -o mountdb` and then do the recovery manually.

After doing manual recovery, run `dbed_vmclonedb -o update_status` to update the repository. [620793]

**Must manually install VRTScsocw package**

The `VRTScsocw` package is missing whenever installing Veritas Storage Foundation for Oracle HA using option 1 (Required Veritas Storage Foundation for Oracle packages) or option 2 (All Veritas Storage Foundation for Oracle packages). To use the configuration wizard to set up the Oracle agent, this package must be installed manually from the dvd1 image mount point at:

```
cluster_server_agents/oracle_agent/rpms
```

---

**Note:** Whenever uninstalling this product, in some cases this package may not be removed by the product uninstaller. In this case, the package must be removed manually.

---

[622316]

## Veritas Storage Foundation for DB2 software issues

The following are known issues in this release of Veritas Storage Foundation for DB2:

### Cannot restore if tablespace is converted from Quick I/O to regular file after backup

If you convert a tablespace from a Quick I/O file to a regular file after backing up the database, you will not be able to restore the tablespace from that backup. For example, if you take a backup of a database that has a DMS tablespace with Quick I/O files as containers, and later convert the Quick I/O files to regular files, restoring the database from that backup will fail.

Workaround: Use the `qio_recreate` command to re-create the necessary Quick I/O files before you restore the database. [25272]

### Spaces in container path names

This release does not support spaces in container path names. [31604]

### Internet Explorer security setting required for VEW Web GUI

The security setting in the Internet Explorer browser must be set to medium or lower in order for VEA Web GUI run properly. [223589]

### Removing a snapplan

If a snapplan is in a state where `dbed_vmchecksnap -o remove` will not remove it, you can remove it by first forcing a snapshot and then resyncing. After this, use `dbed_vmchecksnap -o remove` to remove the snapplan entry from the repository. [276354]

### Snapplans with the same name

If two snapplans are created with the same name but different paths, the error message `snapplan already exists` is displayed. [287057]

### DPF does not fully support localization

The DB2 Database Partition Feature (DPF) does not fully support localization. As a result, the command output for `db2ed_checkconfig_all`, `db2ed_saveconfig_all`, and `db2ed_ckptcreate_all` may display garbage characters in the Japanese locale. [303712]

### Size of checkpoint object in the GUI

The checkpoint object in the GUI does not show the correct size (in blocks) for the checkpoint. This size is not updated even after rescanning checkpoints in the GUI. [412038]

### Starting checkpoint policies from the GUI

Checkpoint policies cannot be started from the GUI. [506088]

### Removing the SFDB repository database does not remove .odbc.ini

Removing the SFDB repository database using the `sfua_db_config -o dropdb` command does not also remove the `/etc/vx/vxdbed/.odbc.ini` file. [534163, 611943]

Workaround: After running `sfua_db_config -o dropdb`, you can manually remove `.odbc.ini` with the `rm` command:

```
rm /etc/vx/vxdbed/.odbc.ini
```

### Unmounted checkpoint clone database reappears in the Java GUI

An unmounted checkpoint clone database reappears in the Java GUI tree after rescanning. [567342]

### SFDB commands may fail due to differing locales

If SFDB commands are executed with a locale that differs from the locale in use when the SFDB server was started, the commands may fail with the following message:

```
([Sybase][ODBC Driver][Adaptive Server Anywhere]Syntax error ).
```

Workaround: Execute the following commands to correct this issue.

```
/opt/VRTSdbcom/bin/sfua_db_config -o stopserver  
/opt/VRTSdbcom/bin/sfua_db_config -o startserver  
/opt/VRTSdbcom/bin/sfua_db_config -o startdb
```

[582069]

### Storage Checkpoints not supported with Database FlashSnap clones

Storage Checkpoint operations are currently not supported for databases cloned with Database FlashSnap. [600431]

### db2ed\_clonedb and db2ed\_vmclonedb do not support automatic storage databases

The `db2ed_clonedb` and `db2ed_vmclonedb` commands do not support automatic storage databases. Using either command on an automatic storage database results in the following message:

```
DBT1037N: CONT_PATH entries cannot be specified for an automatic  
storage table space
```

[600490]

### DBDST class names limited to 29 characters

The `dbdst_admin -o rmclass` command fails when attempting to remove a class name of 30 characters or more. The maximum class name length is 29 characters. [601746]

**Web GUI statistic scheduler skips first statistic collection**

The Web GUI statistic scheduler uses the client timestamp instead of the server timestamp. This causes the first statistic collection to be skipped. For example, suppose the machine time is 14:00 and the client time is 13:45. If the user wants to have three samples taken starting at 13:45, with 30 minutes between each sample, only two samples will be shown: one at 14:15 and another at 14:45. [608697]

**Cannot Refresh View Statistics wizard in Firefox browser**

When using the Web GUI with the Mozilla Firefox browser, the Refresh command in the View Statistics wizard does not work. [608697]

**db2ed\_ckptmount quits silently if checkpoint uses another checkpoint's mount prefix**

If a checkpoint uses a mount prefix that was already used for another checkpoint, `db2ed_ckptmount` quits silently with return code 1.

Workaround: Explicitly check the `db2ed_ckptmount` return code. Also, check the output produced by `db2ed_ckptdisplay`. [610283]

**Change file permission for `admin.properties` when changing port number**

If you change the communication port number in `/etc/vx/vxdbed/admin.properties`, you must change the permission of this file to 444 by using the following command:

```
chmod 444 /etc/vx/vxdbed/admin.properties
```

[610437]

**sfua\_db\_config -o startdb does not confirm repository database started**

The `sfua_db_config -o startdb` command does not print a message to indicate whether the SFDB repository database was successfully started or not.

Workaround: Check for the success or failure by subsequently running:

```
sfua_db_config -o dbstatus
```

[613681]

### **Unmounting clone database and deleting checkpoint commands seem to hang**

The `db2ed_clonedb -o umount` command sometimes seems to hang. When you check the process stack it is executing the command `db2ed_dbprocli`.

Also, when deleting an existing checkpoint, the `vxpal -a DBEDAgent` process starts taking up a lot of processing space and the CLI might appear to hang if you have been running a lot of checkpoint commands.

**Workaround:** For either issue, stop the `vxpal -a DBEDAgent` process by running the following commands as root:

```
/etc/init.d/vxpal.DBEDAgent stop  
/etc/init.d/vxpal.DBEDAgent start
```

[614055, 614815]

### **Statistic tasks via Web GUI is unsupported when connecting to a 4.1 host**

Running statistic tasks from the Web GUI is not supported when connecting to a 4.1 host. If you try to run "Create Statistic Task", you will receive the following error message:

```
Error V-40-49408-42 - An interface with the unique identifier  
specified does not exist for this object.
```

[615818]

## **Software limitations**

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

### **Veritas File System software limitations**

#### **fsck may terminate when applied to unclean file systems from Veritas File System 4.0 or 4.1**

Due to an incompatibility in the VxFS `fsck` utility between the 5.0 and 4.0 and 4.1 releases, `fsck` may terminate during intent log replay if run on older file systems. This only affects file systems that were previously running under VxFS 4.0 or 4.1 that are CVM-shared volumes or multi-volume file systems, and that were not cleanly unmounted prior to use in VxFS 5.0.

If you encounter this situation, perform a full `fsck` to bring the file system to a consistent, clean state that is ready to be mounted.

See the `fsck_vxfs(1M)` manual page.

## Veritas File System Web GUI online help known issues

The following known issues were reported for this release:

- For the **Mount Storage Checkpoint** operation, you must select an existing Storage Checkpoint from the drop-down list. You cannot manually enter a Storage Checkpoint name.
- The **Creating a new file system on a volume set** task can only be performed on VxFS file systems.
- For the **Remount Storage Checkpoint** operation, the **More info** link on the second wizard page does not function properly for cluster file systems.
- For the **Unmount Storage Checkpoint** operation, the **More info** link on the second wizard page does not function properly for cluster file systems.

## Quick I/O, ODM, mount -o cio, and the VX\_CONCURRENT advisory are mutually exclusive

The VX\_CONCURRENT advisory cannot be set on a file that is actively open by Quick I/O or ODM. A file that has the VX\_CONCURRENT advisory set may not be concurrently opened by Quick I/O or ODM. Quick I/O and ODM access are not allowed for any files on a file system that is mounted with the `-o cio` mount option.

## Volume management support

The Veritas File System (VxFS) is only supported on Veritas Volume Manager (VxVM) volumes.

## sendfile support

The current version of VxFS does not support the `sendfile()` system call. In order to use Apache with VxFS, use the Apache configuration option `EnableSendFile Off`.

## Security-enhanced Linux

VxFS includes Security-Enhanced Linux (SE Linux) support for evaluation purposes only. VxFS conforms to the requirements of the SE Linux API. However, security policy files are not available for the Veritas product stack.

## Veritas Storage Foundation for Databases software limitations

The following are the software limitations for Veritas Storage Foundation for Databases.

### **Some features stop working after a GCO failover**

Some Storage Foundation for Databases features do not work correctly after a Global Cluster (GCO) Failover. In 5.0, the Storage Foundation for Database (SFDB) repository and tools do not manage virtual hostnames correctly in a Global Cluster environment. The SFDB repository does not correctly adjust to the secondary host after the failover.

Features like Storage Checkpoint, Database FlashSnap, the scheduler, and Database Dynamic Storage Tiering (DBDST) will not function as normal after a failover. However, features such as Oracle Disk Manager (ODM), Quick I/O, and Concurrent I/O (CIO) will continue to work after a failover. This issue will be fixed after the next release. [563603]

### **Differing locales produces unintelligible characters in GUI**

The GUI does not support database users having a different locale than the superuser's locale. The GUI will display unintelligible characters if the SFDB repository server starts with a locale that is different from the database user locale (client). [605487]

### **DBDST limitations with non-English filenames and placement class names**

DBDST does not work on non-English database filenames or non-English placement class names, due to limitations in VxFS Dynamic Storage Tiering and VxVM volume tags. VxFS Dynamic Storage Tiering does not support placement of non-English filenames. The VxVM volume tag feature does not support non-English volume tag names. [599164]

### **Avoid using UNIX VEA via PC-based UNIX emulators**

There can be problems displaying deep mapping topology in PC-based UNIX emulators like Exceed. Use the Windows VEA client instead of running the UNIX VEA client via emulators.

## CLI database state changes are delayed in GUI

If you use the command line to start or stop the database, the state change is not immediately shown in the GUI. This delay can take up to 60 minutes.

Workaround: Start or stop the database from the GUI, or do a manual rescan from the GUI after starting or stopping with CLI. [604685]

## Deep mapping unsupported

Deep mapping on EMC SYMCLI is currently not supported.

## Command Line Interface limitations

The following commands do not support multipartition databases on SMP architectures:

- db2ed\_clonedb
- db2ed\_mon
- db2ed\_vmchecksnap
- db2ed\_vmclonedb

## Disabled monitoring agent

In this release of Veritas Storage Foundation for DB2, the monitoring agent is disabled for multiple partition databases in the GUI.

## Database cloning limitation

If you clone a database and mount it, ensure that the directory where the mount point resides is owned by the instance owner of the cloned database.

If the directory where the mount point resides is not owned by the instance owner, an error message is displayed when you attempt to remove and unmount the cloned database.

For example:

```
$ db2ed_clonedb -I inst01 -S prod -T clone -c \  
Checkpoint_1105997700 -m /mnt
```

where /mnt is created by root and the owner has been changed to inst01.

When you attempt to remove and unmount the clone database, you will get the following error message:

```
$ db2ed_clonedb -T clone -o umount -d  
rm: Unable to remove directory /mnt Permission denied
```

This error message does not affect the functionality of db2ed\_clonedb. The clone database has been removed and unmounted even when you receive this error message.

To avoid this error, create a directory under / as root and change the owner of the directory to the instance owner. Then, specify a mount point under the newly created directory. For example, instead of using the mount point /mnt as in the above example, specify a mount point under /mnt, such as /mnt/clone:

```
$ db2ed_clonedb -I inst01 -S prod -T clone -c \  
Checkpoint_1105997700 -m /mnt/clone
```

---

**Note:** If your mount point is under the directory /tmp, you will not encounter this problem. [285139]

---

## No support for Intelligent Storage Provisioning

The Standard, Standard HA, Enterprise, and Enterprise HA versions of Veritas Storage Foundation for DB2 do not support Intelligent Storage Provisioning (ISP).

## Using VxVM volumes as DB2 DEVICE containers

For this release, it is recommended that the VxVM raw device interface be used when configuring a raw device as a DB2 container. Using VxVM raw interface ensures fast and reliable I/O support. Also, VxVM's 5.0 raw device interface supports full Linux native asynchronous I/O.

Make sure the DB2 instance owner has read/write access to the VxVM volume. Also, the DB2 instance owner should have permissions to change the directory to /dev/vx. By default, only the root user can access the /dev/vx directory.

The following example shows how a DMS tablespace is created on a VxVM volume:

```
CREATE REGULAR TABLESPACE USERRAW \  
PAGE SIZE 4K \  
MANAGED BY DATABASE \  
USING (DEVICE '/dev/vx/dsk/db2dg/db2vol1' 128000) \  
EXTENT SIZE 32 PREFETCH SIZE 32 \  
BUFFERPOOL IBMDEFAULTBP
```

An alternative method to use a VxVM volume is to go through the Linux raw binding interface. For further information, refer to the man page for raw commands on Linux. Using Linux raw binding is *not* a recommended method for VxVM.

## Deep mapping on hard disk arrays

This release of Veritas Storage Foundation 5.0 for DB2 will not offer the deep mapping feature because partner disk array software on Linux platforms have been unavailable. The storage mapping display will show disk arrays only to the LUN level.

During installation, the `VRTSvail` package will not be installed. However, this package is included in this release, so that this issue can be corrected in a future maintenance pack release.

## Use of buffered I/O

VxFS provides sequential consistency among the read and write accesses to a file – that is, the results of these reads and writes appear as if they occurred in a serial order consistent with program order, and each access appears to be atomic. This is consistent with traditional Unix file system semantics for reads and writes.

Other Linux file systems do not guarantee atomicity of reads and writes, which allows more efficient implementation, but also requires that applications use other mechanisms to achieve the same level of consistency if they require it.

VxFS file consistency can be relaxed in several ways. In case of a cluster mount, reads from and writes to a file are not considered conflicting unless they operate on an overlapping byte range. On a local mount, the user can request that the Concurrent I/O option be used on a specific file. This will mean that reads and writes are not guaranteed to be atomic, which can be desirable behavior for some applications.

Veritas recommends the use of Concurrent I/O with DB2. In DB2 UDB version 8.2.2 or above, Concurrent I/O is used with VxFS when DBAs choose “Direct I/O” for a given tablespace. When Direct I/O is specified this way, the DB2 server activates Concurrent I/O semantics in a way that is transparent to users.

For more details on Concurrent I/O, see [“Product descriptions”](#) on page 12. Also see “Understanding Concurrent I/O” in the *Veritas Storage Foundation for DB2 Administrator’s Guide* to learn how to use Concurrent I/O with DB2 UDB on Linux, Unix, and Windows.

## Documentation

After the installation procedure is complete, documents are available online under the `/opt/VRTS/docs` directory. Documents are provided as Adobe Portable Document Format (PDF) files and in a searchable HTML-based format. To view or print PDF documents, you must have the Adobe Acrobat Reader installed.

Installing documentation and manual pages is optional.

### Veritas documentation disc

The Veritas documentation disc provides searchable, HTML documentation for each product in this release. Printable PDF documents are also included on the disc.

All documentation is organized by product groups.

### Release Notes and installation guides

Release notes and installation guides are not installed by any packages. Veritas recommends that you copy them from the software disc to the `/opt/VRTS/docs` directory on your system after product installation so that they are available for future reference.

Release notes for component products in all versions of the Veritas Storage Foundation are located under the `storage_foundation/release_notes` directory of the Veritas Storage Foundation disc or the `cluster_server/release_notes` directory of the Veritas Cluster Server disc.

Installation guides in all versions of the Veritas Storage Foundation are located under the `storage_foundation/docs` directory of the Veritas Storage Foundation disc or the `cluster_server/docs` directory of the Veritas Cluster Server disc.

It is important that you read the relevant component product release notes before installing any version of Veritas Storage Foundation:

- *Veritas Volume Replicator Release Notes* (`vvr_notes.pdf`)
- *Veritas Cluster Server Release Notes* (`vcs_notes.pdf`)

## Veritas Storage Foundation guides

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

**Table 1-1** 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 Release Notes (this document)</i>	sf_notes.pdf
<i>Veritas Storage Foundation Installation Guide</i>	sf_install.pdf
<i>Veritas Storage Foundation for DB2 Administrator's Guide</i>	sf_db2_admin.pdf
<i>Veritas Storage Foundation for Oracle Administrator's Guide</i>	sf_ora_admin.pdf
<i>Veritas Storage Foundation Intelligent Storage Provisioning Administrator's Guide</i>	sf_isp_admin.pdf
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<i>Veritas Volume Manager Troubleshooting Guide</i>	vxvm_tshoot.pdf
<i>Veritas FlashSnap Point-In-Time Copy Solutions Administrator's Guide</i>	flashsnap_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

## Veritas Cluster Server Documentation

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

**Table 1-2** 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 User's Guide</i>	vcs_users.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 High Availability for VMware ESX Virtual Machines Application Note</i>	vm_esx_server.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 EMC SRDF Installation and Configuration Guide</i>	vcs_srdf_install.pdf
<i>VCS Enterprise Agent for Hitachi TrueCopy Installation and Configuration Guide</i>	vcs_truecopy_install.pdf

## Veritas Volume Replicator Documentation

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

**Table 1-3** Guides in Veritas Volume Replicator Documentation Set

Guide Title	Filename
<i>Veritas Volume Replicator Release Notes</i>	vvr_notes.pdf
<i>Veritas Volume Replicator Installation Guide</i>	vvr_install.pdf
<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 Web Console Administrator's Guide</i>	vvr_web_admin.pdf

**Table 1-3** Guides in Veritas Volume Replicator Documentation Set

Guide Title	Filename
<i>Veritas Volume Replicator Advisor User's Guide</i>	vvr_advisor_users.pdf
<i>Veritas Cluster Server Agents for Veritas Volume Replicator Configuration Guide</i>	vvr_agents_config.pdf

## Veritas Storage Foundation for Databases Documentation Changes

The 5.0 release introduces a new guide for the GUI, *Veritas Storage Foundation for Oracle Graphical User Interface Guide* and the *Veritas Storage Foundation for DB2 Graphical User Interface Guide*. They can be found in the Veritas Storage Foundation Documentation Set as the file `sf_ora_gui.pdf` and `sf_db2_gui.pdf`.



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### Expat XML Parsing Library

Author: James Clark.

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MD5.h

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#### JavaTip87: Automate the Hourglass Cursor

Kyle Davis

Portions of this code taken from an article available as of 2/02/02 on the JavaWorld Internet site, entitled Javatip87: Automate the HourGlass Cursor" by Kyle Davis.

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IO-String-1.06

IO-Tty-1.02

libnet-1.19

List-Compare-0.31

Log dispatch perl module

Logfile rotate perl module

Module-Build-0.2611

MIME-Base64-3.07

HTML-Tagset-3.10

HTML-Parser-3.50

Net-DNS-0.49

Net-DNS-SEC-0.12

Net-Netmask-1.9011

Net-Telnet-3.03

Params validate perl module

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Test-Plan-0.02

Test-Simple-0.60

Time-Date-1.16

Time zone info

URI-1.35

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## Sockets++ library

University of Texas

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## STL Port

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Sysdep.c

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UUID.c

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