

HP Serviceguard Storage Management Suite Version A.02.01 for HP-UX 11i v2 Release Notes

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Printing History

The most recent printing date and part number indicate the current edition.

Table 1 Printing History

Printing Date	Part Number	Edition	Changes
April 2009	T2271-90053	1	This is the initial release of the <i>HP Serviceguard Storage Management Suite Version A.02.01 for HP-UX 11i v2 Release Notes</i>
June 2010	T2271-90053	2	Edits were made throughout this edition to improve technical content and to make corrections to the Supported SG SMS Bundle Upgrade Paths matrix.

1 HP Serviceguard Storage Management Suite Version A.02.01 for HP-UX 11i v2 Release Notes

Announcements

The HP Serviceguard Storage Management Suite (SG SMS) bundles integrate HP Serviceguard (SG) with the Veritas Storage Foundation™ by Symantec (SF). This combination provides powerful database and storage management capabilities while maintaining the mission-critical reliability HP Serviceguard customers have come to expect. Veritas Storage Foundation (SF) combines the industry-leading Veritas Volume Manager™ by Symantec (VxVM) and the Veritas File System™ by Symantec (VxFS) to provide a complete online storage management solution. With SF, physical disks can be grouped into logical volumes to improve disk utilization and eliminate storage-related downtime. In addition, SF can distribute I/O loads across multiple paths to improve performance and move unimportant or out-of-date files to inexpensive storage media. Customers running an Oracle Real Application Clusters (RAC) environment benefit from enhanced database performance and file system management when utilizing Oracle Disk Manager and the Veritas Storage Foundation™ Cluster File System by Symantec (CFS) technologies.

As integrated solutions, the HP Serviceguard Storage Management Suite bundles are supported directly by HP, providing a single point of contact for all of the software in each bundle.

The HP Serviceguard Storage Management Suite version A.02.01 bundles for HP-UX 11i v2 include HP Serviceguard version A.11.19 and they are:

- Integrated with the Veritas version 5.0 products
- Supported on the HP-UX 11i v2 operating system – requires an HP-UX 11i v2 version released in September 2006, or later
- Able to run on both HP 9000 and HP Integrity Servers

Understanding HP Serviceguard Storage Management Suite Version Identifiers

The following Table 1-1 lists the major components included in each HP Serviceguard Storage Management Suite (SG SMS) version.

The SG SMS version number, “A.xx.yy.zz”, reflects the Veritas™ Storage Foundation version and the HP Serviceguard version. The “xx” increments with Veritas™ Storage Foundation version changes, the “yy” increments with HP Serviceguard version changes, and the “zz” is reserved for incremental updates to previously released SG SMS versions. For example, with SG SMS version A.01.00, the “.01” indicates Veritas™ Storage Foundation version 4.1 and the “.00” indicates HP Serviceguard version A.11.17.

For each SG SMS version, the SG SMS product bundles for that version are supported on HP-UX 11i v2, HP-UX 11i v3, or on both OS versions.

Table 1-1 SG SMS Version Numbering and Bundle Suffix Format

SG SMS Version	Veritas™ Storage Foundation Version	HP Serviceguard Version	HP-UX Version	Release Date
A.01.00	4.1	A.11.17	11i v2	December 2005
A.01.01	4.1	A.11.18	11i v2	June 2007
A.02.00	5.0	A.11.18	11i v2 11i v3	11i v2 = June 2007 11i v3 = June 2008

Table 1-1 SG SMS Version Numbering and Bundle Suffix Format *(continued)*

SG SMS Version	Veritas™ Storage Foundation Version	HP Serviceguard Version	HP-UX Version	Release Date
A.02.01	5.0	A.11.19	11i v2 11i v3	March 2009
A.02.01.01	5.0	A.11.19	11i v3	May 2010

Understanding HP Serviceguard Storage Management Suite Product Bundles

The HP Serviceguard Storage Management Suite (SG SMS) version A.02.01 bundles for HP-UX 11i v2 include version A.02.01 software and licenses, along with installation and support services available through product options. These bundles are offered in the configurations listed in Table 1-2.

The SG SMS product bundle number format is T27xyab, where the *x* is 7 for “standard” bundles and 8 or 9 for HP-UX operating environment bundles. The *y* can be 1, 3, 4, 5, 6 or 7 for each of the standard SG SMS bundles. The *a* increments for each Veritas™ Storage Foundation version, starting with B for Veritas™ Storage Foundation version 4.1, then C for Veritas™ Storage Foundation version 5.0, and so on. The *b* increments for each HP-UX Version, starting with A for HP-UX 11i v2, then B for HP-UX 11i v3, and so on.

Table 1-2 SG SMS Version A.02.01 for HP-UX 11i v2 Bundles

SG SMS Bundle	Bundle Configuration
T2771CA	Serviceguard Storage Management Suite bundle
T2773CA	Serviceguard Storage Management Suite for Oracle bundle
T2774CA	Serviceguard Storage Management Suite for Oracle Premium bundle
T2775CA	Serviceguard Cluster File System bundle
T2776CA	Serviceguard Cluster File System for Oracle bundle NOTE: This bundle can be licensed only as a component of the following HP-UX Mission Critical Operating Environment (MCOE) bundles: T2794CA, T2795CA, T2796CA, and T2797CA. This bundle cannot be purchased and licensed independent from the MCOE bundles.
T2777CA	Serviceguard Cluster File System for RAC bundle
T2794CA	Includes bundle T2774CA software with the HP-UX 11i v2 Mission Critical Operating Environment (MCOE)
T2795CA	Includes bundle T2775CA software with the HP-UX 11i v2 Mission Critical Operating Environment (MCOE)
T2796CA	Includes bundle T2776CA software with the HP-UX 11i v2 Mission Critical Operating Environment (MCOE)
T2797CA	Includes bundle T2777CA software with the HP-UX 11i v2 Mission Critical Operating Environment (MCOE)



NOTE: The T2794CA, T2795CA, T2796CA, and T2797CA bundles include the MCOE on a separate DVD, they *are not* included on the HP-UX Application Release media (however, the Serviceguard version that is a prerequisite for the SG SMS T279xCA MCOE bundles is delivered on the HP-UX Application Release media). The SG SMS operating environment bundles offer cost savings over purchasing and installing a SG SMS bundle (T277xCA) and an HP-UX MCOE operating environment separately. Licensing fees for products that are included in both the SG SMS (T277xCA) bundle and the HP-UX MCOE operating environment are avoided when the T279xCA bundles are purchased. See “[HP-UX Mission Critical Operating Environment Upgrade Limitations](#)” (page 37) for additional information.

Due to the complexity of configuring clusters, you may wish to use Hewlett-Packard’s high availability consulting services to ensure a smooth installation and rollout. Please contact your HP representative to inquire about high availability consulting. In addition, you should work with your HP representative to ensure that you have the correct firmware revisions for disk drives, disk controllers, LAN controllers, and other hardware.



NOTE: HP recommends that you read these *HP Serviceguard Storage Management Suite Release Notes* and any other related Installation Guides, Release Notes, Read Before Installing Guides, or READMEs before beginning an installation. Requirements and known issues for individual products included in the HP Serviceguard Storage Management Suite bundles are documented in their respective Release Notes. See “[Documentation for this Version](#)” (page 22) for information on SG SMS related documentation.

What’s New with the HP Serviceguard Storage Management Suite Version A.02.01 for HP-UX 11i v2

This is the first HP Serviceguard Storage Management Suite (SG SMS) release that includes Serviceguard version A.11.19 with Veritas™ Storage Foundation 5.0, Veritas™ Storage Foundation for Oracle, and Veritas™ Storage Foundation Cluster File System on HP-UX 11i v2. See [Table 1-3 \(page 18\)](#), for details on the content of the SG SMS bundles.



NOTE: The following HP Serviceguard Storage Management Suite product bundles are discontinued and removed from the price list effective February 1, 2009:

- T2771BA
- T2772BA, T2772CA, and T2772CB
- T2773BA
- T2774BA
- T2775BA
- T2776BA, T2776CA, and T2776CB

The T2776CA and T2776CB bundles will continue to be licensed only as a component of the HP-UX operating environment bundles (MCOE bundles for 11i v2, HAOE and DCOE bundles for 11i v3). The T2776CA and T2776CB bundles cannot be purchased and licensed independent from the HP-UX operating environment bundles that include them.

- T2777BA
- T2794BA
- T2795BA
- T2796BA
- T2797BA

Support for these products will end in 2012. To get the exact dates for the end of the patch phase and the end of support, refer to the support letter at the following URL:

<http://www.hp.com/software/releases/releases-media2/notices/SGSMSSupportLetterJune08.pdf>

If you require assistance, or additional information, contact your HP support representative.

What's New with Serviceguard

Serviceguard version A.11.19 includes the following new features with HP Serviceguard Storage Management Suite version A.02.01 bundles on HP-UX 11i v2:

- You can configure new types of dependencies between packages.
- You can configure package weights and node capacities, allowing you to control broadly which packages can run simultaneously on a given node.
- Support for the IPv6 hostname address family for all cluster components, with some restrictions.
- You can monitor subnets at the IP level, as well as the link level.
- You can make configuration changes while the cluster is running, particularly in regard to the cluster lock, that were not allowed online in previous releases, or were restricted.
- In the case of modular packages, you can make most package configuration changes while the package is running, and you can also make more changes to legacy packages online.
- You can preview the effects both of individual commands and of large-scale cluster changes.
- You can partially start a modular package so as to perform maintenance on the modules that are not started.
- A new utility allows you to monitor applications running inside Virtual Machine (VM) guests.
- You can configure a maximum of 300 packages in a cluster.
- A quorum server can support up to 150 clusters comprising up to 300 nodes. The previous limits were 50 clusters and 100 nodes. The new limits are supported in Quorum Server versions A.02.04 and later.
- There are new Serviceguard demons:

- Service Assistant Daemon: cmserviced (replaces cmsrvassistd)
- Cluster WBEM Agent Daemon: cmwbemd
- Proxy Daemon: cmproxyd
- A new cluster parameter, NETWORK_AUTO_FAILBACK, tells Serviceguard how to handle the recovery of the primary LAN interface after it has failed over to the standby interface because of a link level failure.
- A new parameter, CONFIGURED_IO_TIMEOUT_EXTENSION, must be set for extended-distance clusters using iFCP interconnects between sites.
- Support for HP-UX agile addressing, sometimes also called persistent LUN binding, for device special files (DSFs).
- Supports for HP-UX native multipathing and load balancing.
- There are new networking capabilities:
 - The HP-UX olrad -C command now identifies network interface cards (NICs) that are part of the Serviceguard cluster configuration. You can remove a NIC from the cluster configuration, and then from the system, without bringing down the cluster.
 - Serviceguard now also supports the LAN Monitor mode of APA
- Support of Process IDs (PIDs) of any size, up to the maximum value supported by HP-UX and the node's underlying hardware architecture. Previous versions of HP-UX imposed a limit of 30,000; this limit has been removed as of HP-UX 11i v3.



NOTE: The following Serviceguard A.11.19 features *are not* supported with SG SMS version A.02.01 for HP-UX 11i v2 bundles:

- RS232 is no longer supported for the cluster heartbeat.
- Token Ring and FDDI are no longer supported for the cluster heartbeat and data networks.
- The cmviewcl command no longer supports the -r 11.09 option. -r 11.12 and -r 11.16 are still supported. See the cmviewcl (1m) manpage for details
- HEARTBEAT_INTERVAL and NODE_TIMEOUT are not supported.
- Online addition and deletion of heartbeat and data network interfaces along with the corresponding HEARTBEAT_IP and STATIONARY_IP cluster parameters are not supported.



IMPORTANT: The following dependencies are required when Serviceguard is installed on HP-UX. They are part of the HP-UX Base Operating Environment:

- Open SSL, which includes the OPENSSL-RUN and OPENSSL-LIB filesets
 - The EventMonitoring bundle, which contains the EMS-CORE and EMS-CORE-COM filesets
- OpenSSL and the EventMonitoring bundle are included with all of the HP Serviceguard Storage Management Suite bundles for your convenience.



NOTE: For more information on the HP Serviceguard A.11.19 features that are supported with SG SMS bundles, see the *HP Serviceguard Version A.11.19 Release Notes* available at:

<http://www.docs.hp.com/en/ha.html#Serviceguard>

What's New with Veritas Storage Foundation 5.0

Veritas™ Storage Foundation 5.0 includes the Veritas™ File System (VxFS) and the Veritas™ Volume Manager (VxVM). New features and enhancements for VxFS and VxVM that are supported in the SG SMS version A.02.01 for HP-UX 11i v2 bundles are as follows:

What's New with Veritas File System (VxFS)

The following VxFS features and enhancements, which became available in April 2008, are supported in the SG SMS version A.02.01 for HP-UX 11i v2 bundles:

- Support for Large Directories — VxFS 5.0 introduces an alternate indexing mechanism to improve the performance of file system operations on directories with a large number of entries.
- File Change Log — The VxFS File Change Log (FCL) tracks changes to files and directories in a file system. The FCL can be used by applications, such as backup products, web crawlers, search engines, indexing engines and replication software that typically scan an entire file system searching for modification since a previous scan. This feature was introduced with the VxFS 4.1 release on HP-UX 11i v2. FCL is supported only on file systems with Disk Layout Version 6 or above.
- File-to-Volume and Volume-to-File Mapping in Multi-volume File Systems — supported with two new commands:
 - `fsmap` (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` (determines which data file is resident on a given volume for a multi-volume file system and recovers only the affected files when an unprotected volume is permanently lost)
- Large File Systems and Large File Support — with the HP OnlineJFS license you can create file systems over 2 TB, up to a maximum of 32 TB. The EBFS license is required to create file systems larger than 32 TB. The EBFS license is bundled with the HP Serviceguard Storage Management suite. Contact your HP sales representative for information on obtaining this license. For information on supported file systems and large file support, see the *Supported File and File System Sizes for HFS and JFS* white paper available at: <http://docs.hp.com/en/oshpux11iv2.html#VxFS>
- Cross Platform Data Sharing (CDS) — allows data to be serially shared among heterogeneous systems, where each system has direct access to the physical devices that hold the data. This feature can be used only in conjunction with VxVM
- Concurrent I/O — allows multiple processes to read or write to the same file without blocking other `read(2)` or `write(2)` calls
- Nested Mounts — allows mounting a VxFS file system on any VxFS mount point. A directory on a shared VxFS file system can be used as a mount point for a VxFS file system, enabling nested mounts of shared file systems.
- Multi-volume File System Availability — allows you to mount a multi-volume file system even if a component “data-only” volume is missing, or becomes unavailable
- Dynamic Storage Tiering (DST) — allows administrators of multi-volume VxFS or CFS 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
- 2K Volumes in a Volume Set — the number of volumes allowed in a volume set is now 2048, increased from 256
- File Placement Policy Administration Improved — the `fsppadm` command administers the file placement policies of the DST feature and replaces the functionality of the `fsrpadm`, `fsmove`, and `fsweep` commands (see the `fsppadm(1M)` manual page)
- Pattern-Based Allocation Policies — pattern tables can be assigned to directories or file systems
- Load Balancing — allocation policy where the distribution of extents between volumes is mostly equal, if none of the volumes are full or disabled
- File System Reorganization Prevention — applications that require prevention of extent and log reorganization 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)



NOTE: For more information on VxFS features that are supported with SG SMS version A.02.01 for HP-UX 11i v2 bundles, see the *Veritas™ File System Release Notes HP-UX 11i v2* available on the HP Serviceguard Storage Management Suite media and also at: <http://docs.hp.com/en/oshpux11iv2.html#VxFS> for more information.

What's New with Veritas Volume Manager (VxVM)

The following VxVM features and enhancements, which became available in April 2008, are supported in the SG SMS version A.02.01 for HP-UX 11i v2 bundles:

- Large Hostname Support — support of hostnames up to 31 characters in length
- Default Size of Private Region Increased — from 1 MB to 32 MB
- Disk Group Import Changed — a disk group can be imported without using the `vx dg import` command - `f` option, if all of the disks that were visible the last time the disk group was successfully imported are accessible
- Faster Startup Time — the time it takes to start the VxVM configuration daemon (`vxconfigd`) for device discovery, to initialize dynamic multipathing, and to import disk groups has been significantly reduced
- Faster Cluster Node Joins
- Remote Mirror Improvements
- Dynamic Multipathing (DMP) Enhancements:
 - faster failure detection and recovery - the `vx dmpadm` command can be used to adjust the I/O error recovery and I/O throttling mechanisms on individual paths
 - the values of most DMP tunables can be set using the `vx dmpadm set tune` command
 - retry period for Persistent Group Reservations (PGR)
 - retry period for handling transient errors
- Linked Break-off Snapshot Volumes — a new variant of the third-mirror break-off snapshot
- Volume Tag Changes — volumes can be tagged with an arbitrary tag name and an optional tag value - multiple tags can be associated with a single volume
- Disk Tag Changes — disks can be tagged with an arbitrary tag name and optional tag value - multiple tags can be associated with a single disk.
- Data Migration Enhancement — the `vxassist`, `vxevac` and `vxsd` commands have been enhanced to allow data to be migrated at the volume, disk or subdisk level respectively
- Raw I/O Access — a mechanism is provided to allow access to the raw device nodes of the component volumes of a volume set
- Increased Maximum Number of Component Volumes in a Volume Set — the maximum number of component volumes in a volume set has been increased to 2048
- Cloned Disk Import Improvements — the `vx disk` and `vx dg` commands have been enhanced to allow cloned disks to be identified, and more easily managed
- Intelligent Storage Provisioning (ISP) Enhancements:
 - the `vxassist` command can 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 can be performed by assigning tags and optional tag values to disks and LUNs
 - the `vxassist printrules` or `vxvoladm printrules` commands can 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
- the `vxtemplate listtemplate` command can be used 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 the 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
- Config Backup and Restore — allows the disk group configuration to be backed up and restored if configuration information is lost or corrupted



NOTE: For more information on VxVM features that are supported with SG SMS version A.02.01 for HP-UX 11i v2 bundles, see the *Veritas™ Volume Manager Release Notes HP-UX 11i v2* available on the HP Serviceguard Storage Management Suite media and also at: <http://docs.hp.com/en/oshpux11iv2.html#VxVM>

What's New with Veritas Storage Foundation Cluster File System

The following Veritas™ Storage Foundation Cluster File System (CFS) features and enhancements, which became available in April 2008, are supported for HP Serviceguard Storage Management Suite version A.02.01 for HP-UX 11i v2 bundles that include CFS:

- Concurrent I/O support

This feature extends current support for concurrent I/O to cluster file systems. Semantics for concurrent read/write access on a file in a cluster file system matches those for a local mount.
- Delaylog supported

The `-o delaylog` mount option is supported with cluster mounts. This is the default state for CFS.
- Disk layout version supported

Disk layout Version 7 is now supported on CFS.



NOTE: For more information on CFS features that are supported with SG SMS version A.02.01 for HP-UX 11i v2 CFS bundles, see the *Veritas Storage Foundation 5.0 Cluster File System Administration Guide Extracts for the HP Serviceguard Storage Management Suite* available on the HP Serviceguard Storage Management Suite media and also at: <http://docs.hp.com/en/ha.html#HP%20Serviceguard%20Storage%20Management%20Suite>

What's New with Veritas Storage Foundation for Oracle

The following Veritas™ Storage Foundation for Oracle features and enhancements, which became available in November 2008, are supported with HP Serviceguard Storage Management Suite version A.02.01 for HP-UX 11i v2 bundles that include the Veritas™ Storage Foundation for Oracle:

- Oracle 10gR2 is supported and Oracle certified with HP Serviceguard Storage Management Suite version A.02.01 for HP-UX 11i v2
- Oracle 11gR1 is supported and Oracle certified with HP Serviceguard Storage Management Suite version A.02.01 for HP-UX 11i v2
- Database Dynamic Storage Tiering (DBDST) — moves less-frequently used data to slower, less expensive disks, making room for frequently-accessed data to be stored on faster disks for quicker retrieval

- Improved Task Scheduler — the GUI for the task scheduler has been improved to permit more flexibility in scheduling tasks
- Modified Clone Initialization Parameters — initialization parameters that cause clones to use system resources in a more efficient way than the primary database
- Enhanced Deep Mapping
- Table Level Mapping — a table name can be used as input to the `dbed_analyzer` command to list the disk the table resides in and the space it occupies on each disk
- Oracle Resilvering — the storage layer receives information from the Oracle database on which regions or blocks of a mirrored data file to resync after a system crash
- The following Veritas Storage Foundation for Oracle CLI commands have been enhanced:
 - `dbed_clonedb new -p pfile_modification_file` option has been added to specify modified initialization parameters (contained in `pfile_modification_file`) for the clone
 - `dbed_vmclonedb new -p pfile_modification_file` option has been added to specify modified initialization parameters (contained in `pfile_modification_file`) for the clone
 - `dbed_analyzer new option -o mode=table [-f file |-t table]` lists the disk the specified table resides on and how much space it consumes



NOTE: For more information on Storage Foundation for Oracle (SFO) features that are supported with SG SMS version A.02.01 for HP-UX 11i v2 SFO bundles, see the *HP Storage Management for Oracle 5.0 Release Notes* available on the HP Serviceguard Storage Management Suite media and also at <http://www.docs.hp.com> (search for 5992-1953).

What's Included in the HP Serviceguard Storage Management Suite Version A.02.01 for HP-UX 11i v2

All HP Serviceguard Storage Management Suite bundles deliver core HP Serviceguard products and the Veritas Storage Foundation™ by Symantec (SF). The Veritas Storage Foundation (SF) includes the Veritas Volume Manager (VxVM) and the Veritas File System (VxFS). The Veritas™ Cluster File System by Symantec (CFS) is included in the T2775CA, T2776CA, and T2777CA bundles. A summary of all products delivered in each bundle is available in Table 1-3: “Products, Features, and Associated Bundles”.

The T2774CA, T2775CA, T2776CA and T2777CA bundles can be purchased with the HP-UX 11i v2 Mission Critical Operating Environment (MCOE).



NOTE: VxFS is also known as “Journal File System” (OnlineJFS)

HP Serviceguard Storage Management Suite version A.02.01 for HP-UX 11i v2 bundles include Veritas version 5.0 products.

If you are using Veritas version 4.1 products, see the documentation for HP Serviceguard Storage Management Suite version A.01.00 or A.01.01 bundles.

Veritas™ Storage Foundation Features Included with All HP Serviceguard Storage Management Suite Bundles

The following Veritas Storage Foundation features are included in all of the HP Serviceguard Storage Management Suite version A.02.01 for HP-UX 11i v2 bundles:

- 40TB with Extra Big File System
Extra Big File System Support—The maximum file system size for the HP Serviceguard Storage Management Suite is 40TB provided the Disk Layout is version 6 or greater.
- Online Administration
- Dynamic Multi-pathing (DMP)
- Intelligent Storage Provisioning
- Configuration Backup
- Storage Expert
- History logsystem access from multiple servers.
- Online Intent Log Resize
- Named Data Streams
- Online LUN Resize
- Portable Data Containers (PDC)
- Multi-Volume File System
- Support for Serviceguard clusters up to 16 nodes for CFS environments and up to 16 nodes for non-CFS environments using HP 9000 or HP Integrity Servers or a combination of both.

Products and Features Included with HP Serviceguard Storage Management Suite Bundles

Table 1-3 lists HP and Veritas products and features included with each HP Serviceguard Storage Management Suite version A.02.01 for HP-UX 11i v2 bundle.

Table 1-3 Products, Features, and Associated Bundles

Products	T 2 7 7 1 C A	T 2 7 7 3 C A	T 2 7 7 4 C A	T 2 7 7 5 C A	T 2 7 7 6 C A	T 2 7 7 7 C A
HP Serviceguard version A.11.19	X	X	X	X	X	X
HP Serviceguard Manager version B.02.00	X	X	X	X	X	X
HP Enterprise Cluster Master Toolkit version B.05.00	X	X	X	X	X	X
HP Cluster Object Manager (COM) version B.05.00.00	X	X	X	X	X	X
Veritas File System 5.0	X	X	X	X	X	X
Veritas Volume Manager 5.0	X	X	X	X	X	X
Veritas Enterprise Administrator (VEA) GUI for HP-UX	X	X	X	X	X	X
Dynamic Storage Tiering (DST)			X	X	X	X
Instant Volume Snapshots			X	X	X	X
Storage Checkpoints			X	X	X	X
Disk Group Split and Join			X	X	X	X

Table 1-3 Products, Features, and Associated Bundles (continued)

Products	T 2 7 7 1 C A	T 2 7 7 3 C A	T 2 7 7 4 C A	T 2 7 7 5 C A	T 2 7 7 6 C A	T 2 7 7 7 C A
FastResync (formerly Fast Mirror Resync)			X	X	X	X
Oracle Disk Manager for Oracle 10gR2 and 11gR1		X	X		X	X
Storage Rollback			X		X	X
Storage Mapping to a LUN Level			X		X ¹	X ¹
Veritas Database FlashSnap			X		X	X
Veritas Cluster File System 5.0				X	X	X
Veritas Cluster Volume Manager 5.0				X	X	X
HP Serviceguard Extension for RAC version A.11.19						X

¹ Only supported for SGeRAC with Oracle RAC, not single instance Oracle.

T2771CA HP Serviceguard Storage Management Suite Bundle

The HP Serviceguard Storage Management Suite bundle is an integrated product solution that includes Serviceguard high availability clustering with Symantec's Veritas Volume Manager (VxVM) and File System (VxFS, also known as OnlineJFS). The individual components of this bundle include:

- HP Serviceguard version A.11.19
- HP Serviceguard Manager version B.02.00
- HP Cluster Object Manager (COM) version B.05.00.00
- HP Enterprise Cluster Master Toolkit version B.05.00
- Veritas File System version 5.0 (also known as OnlineJFS)
- Veritas Volume Manager version 5.0
- Veritas Enterprise Administrator (VEA) GUI for HP-UX

T2773CA HP Serviceguard Storage Management Suite for Oracle Bundle

The HP Serviceguard Storage Management Suite for Oracle bundle is an integrated product solution that includes Serviceguard high availability clustering with Symantec's Veritas Volume Manager (VxVM) and File System (VxFS, also known as OnlineJFS) plus special database accelerators for Oracle that provide the performance of raw mode with the manageability of a file system. The individual components of this bundle include:

- HP Serviceguard version A.11.19
- HP Serviceguard Manager version B.02.00
- HP Cluster Object Manager (COM) version B.05.00.00
- HP Enterprise Cluster Master Toolkit version B.05.00
- Veritas File System version 5.0 (also known as OnlineJFS)
- Veritas Volume Manager version 5.0
- Veritas Enterprise Administrator (VEA) GUI for HP-UX
- Oracle Disk Manager for Oracle 10gR2 and 11gR1

T2774CA HP Serviceguard Storage Management Suite for Oracle Premium Bundle

The HP Serviceguard Storage Management Suite for Oracle Premium bundle is an integrated product solution that includes Serviceguard high availability clustering with Symantec's Veritas Volume Manager (VxVM) and File System (VxFS, also known as OnlineJFS) plus special database accelerators for Oracle that provide the performance of raw mode with the manageability of a file system. This premium bundle also includes Dynamic Storage Tiering and FlashSnap technologies. This bundle can also be ordered in combination with the MCOE as T2794CA. The individual components of this bundle include:

- HP Serviceguard version A.11.19
- HP Serviceguard Manager version B.02.00
- HP Cluster Object Manager (COM) version B.05.00.00
- HP Enterprise Cluster Master Toolkit version B.05.00
- Veritas File System version 5.0 (also known as OnlineJFS)
- Veritas Volume Manager version 5.0
- Veritas Enterprise Administrator (VEA) GUI for HP-UX
- Oracle Disk Manager for Oracle 10gR2 and 11gR1
- Storage Rollback
- Storage Mapping to a LUN Level
- Database FlashSnap
- Dynamic Storage Tiering
- Instant Volume snapshots
- Storage CheckPoints
- Disk Group Split and Join (FlashSnap)
- FastResync (formerly Fast Mirror Resync)

T2775CA HP Serviceguard Cluster File System Bundle

The HP Serviceguard Cluster File System is an integrated product solution that includes Serviceguard high availability clustering with Symantec's Veritas Volume Manager (VxVM) and File System (VxFS, also known as OnlineJFS) plus the Veritas Cluster File System and Veritas Cluster Volume Manager for concurrent data access from multiple servers. HP Serviceguard Extension for RAC A.11.19 cannot be added to this bundle. This bundle can also be ordered in combination with the MCOE as T2795CA. The individual components of this bundle include:

- HP Serviceguard version A.11.19
- HP Serviceguard Manager version B.02.00
- HP Cluster Object Manager (COM) version B.05.00.00
- HP Enterprise Cluster Master Toolkit version B.05.00
- Veritas File System version 5.0 (also known as OnlineJFS)
- Veritas Volume Manager version 5.0
- Veritas Enterprise Administrator (VEA) GUI for HP-UX
- Veritas Cluster File System
- Veritas Cluster Volume Manager
- Dynamic Storage Tiering
- Instant Volume snapshots
- Storage CheckPoints
- Disk Group Split and Join (FlashSnap)
- FastResync (formerly Fast Mirror Resync)

T2776CA HP Serviceguard Cluster File System for Oracle Bundle

The HP Serviceguard Cluster File System for Oracle is an integrated product solution that includes Serviceguard high availability clustering with Symantec's Veritas Volume Manager (VxVM) and File System (VxFS, also known as OnlineJFS) plus the Veritas Cluster File System and Veritas Cluster Volume Manager for concurrent data access from multiple servers for Oracle single instance environments. This bundle also includes special database accelerators for Oracle that provide the performance of raw mode with the manageability of a file system. HP Serviceguard Extension for RAC A.11.19 can be added to this bundle.



NOTE: This bundle can be licensed only as a component of the T2796CA Mission Critical Operating Environment bundle. This bundle cannot be purchased and licensed independent from the T2796CA bundle.

If your requirements change, you can install HP Serviceguard Extension for RAC A.11.19 after you install an operating environment bundle that includes the T2776CA bundle, to have the same functionality as the Oracle RAC bundle (T2777CA). The individual components of the T2776CA bundle include:

- HP Serviceguard version A.11.19
- HP Serviceguard Manager version B.02.00
- HP Cluster Object Manager (COM) version B.05.00.00
- HP Enterprise Cluster Master Toolkit version B.05.00
- Veritas File System version 5.0 (also known as OnlineJFS)
- Veritas Volume Manager version 5.0
- Veritas Enterprise Administrator (VEA) GUI for HP-UX
- Veritas Cluster File System
- Veritas Cluster Volume Manager
- Dynamic Storage Tiering
- Instant Volume snapshots
- Oracle Disk Manager for Oracle 10gR2 and 11gR1
- Storage Rollback
- Storage CheckPoints
- Disk Group Split and Join (FlashSnap)
- FastResync (formerly Fast Mirror Resync)
- Storage Mapping to a LUN Level (only supported for SGeRAC with Oracle RAC, not single instance Oracle)
- Database FlashSnap

T2777CA HP Serviceguard Cluster File System for RAC Bundle

The HP Serviceguard Cluster File System for RAC is an integrated product solution that includes Serviceguard high availability clustering and Serviceguard Extension for RAC with Symantec's Veritas Volume Manager (VxVM) and File System (VxFS, also known as OnlineJFS) plus the Veritas Cluster File System and Veritas Cluster Volume Manager for concurrent data access from multiple servers for Oracle RAC environments. This bundle also includes special database accelerators for Oracle that provide the performance of raw mode with the manageability of a file system. This bundle can also be ordered in combination with the MCOE as T2797CA. The individual components of this bundle include:

- HP Serviceguard version A.11.19
- HP Serviceguard Extension for RAC A.11.19
- HP Serviceguard Manager version B.02.00
- HP Cluster Object Manager (COM) version B.05.00.00

- HP Enterprise Cluster Master Toolkit version B.05.00
- Veritas File System version 5.0 (also known as OnlineJFS)
- Veritas Volume Manager version 5.0
- Veritas Enterprise Administrator (VEA) GUI for HP-UX
- Veritas Cluster File System
- Veritas Cluster Volume Manager
- Dynamic Storage Tiering
- Instant Volume snapshots
- Oracle Disk Manager for Oracle 10gR2 and 11gR1
- Storage Rollback
- Storage CheckPoints
- Disk Group Split and Join (FlashSnap)
- FastResync (formerly Fast Mirror Resync)
- Storage Mapping to a LUN Level (only supported for SGeRAC with Oracle RAC, not single instance Oracle)
- Database FlashSnap

Documentation for this Version

Table 1-4 (page 22), lists the documents that are included on the HP Serviceguard Storage Management Suite Version A.02.01 for HP-UX 11i v2 DVD.

These documents are also published on the HP-UX documentation web site at: <http://docs.hp.com> (see the *HP Serviceguard Storage Management Suite* section under *High Availability*, and also see the *HP-UX 11i v3 Operating Environment* section). Using the docs.hp.com search feature with the document part number is an efficient way locate a specific document.

- T2771CA HP Serviceguard Storage Management Suite bundle.
- T2773CA HP Serviceguard Storage Management Suite for Oracle bundle.
- T2774CA HP Serviceguard Storage Management Suite for Oracle Premium bundle also available in combination with the MCOE as T2794CA bundle.
- T2775CA HP Serviceguard Cluster File System bundle also available in combination with the MCOE as T2795CA bundle.
- T2776CA HP Serviceguard Cluster File System for Oracle bundle, available *only* in combination with the MCOE as the T2796CA bundle.
- T2777CA HP Serviceguard Cluster File System for RAC bundle also available in combination with the MCOE as T2797CA bundle.

Table 1-4 Product Documents and Associated Bundles

Document Title	T	T	T	T	T	T
	2	2	2	2	2	2
	7	7	7	7	7	7
	7	7	7	7	7	7
	1	3	4	5	6	7
	C	C	C	C	C	C
	A	A	A	A	A	A
<i>HP Serviceguard Storage Management Suite Version A.02.01 for HP-UX 11i v2 Release Notes, Edition 2</i> (p/n T2771-90053)	X	X	X	X	X	X
<i>Serviceguard A.11.19 Release Notes</i> (p/n B3935-90125)	X	X	X	X	X	X
<i>Managing Serviceguard</i> (p/n B3936-90140)	X	X	X	X	X	X
<i>Enterprise Cluster Master Toolkit B.05.00 Release Notes</i> (p/n T1909-90066)	X	X	X	X	X	X

Table 1-4 Product Documents and Associated Bundles (continued)

Document Title	T 2 7 7 1 C A	T 2 7 7 3 C A	T 2 7 7 4 C A	T 2 7 7 5 C A	T 2 7 7 6 C A	T 2 7 7 7 C A
<i>Event Monitoring Service Version A.04.20.11.03, A.04.20.23.03, and A.04.20.31.03 Release Notes (p/n B7609-90059)</i>	X	X	X	X	X	X
<i>Using the Event Monitoring Service (p/n B7609-90049)</i>	X	X	X	X	X	X
<i>OpenSSL A.00.09.07m.041, A.00.09.07m.042, and A.00.09.08h.040 Release Notes (p/n 5992-5424)</i>	X	X	X	X	X	X
<i>HP Quorum Server Version A.04.00 Release Notes (p/n B8467-90045)</i>	X	X	X	X	X	X
<i>HP WBEM Services Version A.02.07 Release Notes HP-UX 11i (p/n B8465-90040)</i>	X	X	X	X	X	X
<i>Veritas™ 5.0 Installation Guide (p/n 5991-8041)</i>	X	X	X	X	X	X
<i>Veritas™ Enterprise Administrator (VEA 500 Series) Getting Started Guide (p/n 5991-1844)</i>	X	X	X	X	X	X
<i>Veritas™ Enterprise Administrator User's Guide (p/n 5991-5515)</i>	X	X	X	X	X	X
<i>Veritas Storage Foundation™ 5.0 Intelligent Storage Provisioning Administrator's Guide (p/n 5992-0506)</i>	X	X	X	X	X	X
<i>Veritas Storage Foundation™ Intelligent Storage Provisioning Solutions Guide (p/n 5992-0507)</i>	X	X	X	X	X	X
<i>Veritas™ File System 5.0 Release Notes (p/n 5991-8039)</i>	X	X	X	X	X	X
<i>Veritas™ File System 5.0 Administrator's Guide (p/n 5991-5110)</i>	X	X	X	X	X	X
<i>Veritas™ Volume Manager 5.0 Release Notes (p/n 5991-8040)</i>	X	X	X	X	X	X
<i>Veritas™ Volume Manager 5.0 Administrator's Guide (p/n 5991-5512)</i>	X	X	X	X	X	X
<i>Veritas™ Volume Manager 5.0 Hardware Notes (p/n 5991-1839)</i>	X	X	X	X	X	X
<i>Veritas™ Volume Manager 5.0 Migration Guide (p/n 5991-5513)</i>	X	X	X	X	X	X
<i>Veritas™ Volume Manager 5.0 Troubleshooting Guide (p/n 5991-5854)</i>	X	X	X	X	X	X
<i>Veritas Storage Foundation™ 5.0 Cross-Platform Data Sharing For Volume Manager Administrator's Guide (p/n 5992-0505)</i>	X	X	X	X	X	X
<i>Veritas™ FlashSnap Point-In-Time Copy Solutions Administrator's Guide (p/n 5992-0510)</i>			X	X	X	X
<i>Veritas Storage Foundation™ for Oracle 5.0 Release Notes (p/n 5991-8083)</i>		X	X		X	X
<i>Veritas Storage Foundation™ 5.0 for Oracle Administrator's Guide (p/n 5992-0508)</i>		X	X		X	X
<i>Veritas Storage Foundation™ for Oracle Graphical User Interface Guide (p/n 5992-0509)</i>		X	X		X	X
<i>Veritas Storage Foundation™ Cluster File System 5.0 Installation and Administration Guide HP Serviceguard Storage Management Suite Extracts (p/n T2771-90034)</i>				X	X	X
<i>Serviceguard Extension for RAC A.11.19 Release Notes</i>						X

Table 1-4 Product Documents and Associated Bundles (continued)

Document Title	T 2 7 7 1 C A	T 2 7 7 3 C A	T 2 7 7 4 C A	T 2 7 7 5 C A	T 2 7 7 6 C A	T 2 7 7 7 C A
<i>Using Serviceguard Extension for RAC (p/n T1859-90038)</i>						X
<i>Veritas Storage Foundation™ for Oracle RAC Administrator's Guide HP Serviceguard Storage Management Suite Extracts (p/n T2771-90035)</i>						X

Further Information

- The most recent documentation and white papers (including any updates to these Release Notes) are available on <http://docs.hp.com> in the *HP Serviceguard Storage Management Suite* section under *High Availability*, and in the *HP-UX 11i v2 Operating Environment* section.
- Support information, including current information on patches and known problems, is available from the Hewlett-Packard IT Resource Center web page:

<http://itrc.hp.com> (Americas and Asia Pacific) <http://europe.itrc.hp.com> (Europe)

Click on “Search Technical Knowledge Base.” Although anyone can access the site, customers with valid support contracts can log in and search for detailed technical information.

To receive the latest news on recommended patches, product support matrixes, and recently supported hardware, subscribe to the “High Availability Program Tips and Issues Digest” on the ITRC.

Compatibility Information and Installation Requirements

HP recommends that you read these *HP Serviceguard Storage Management Suite Release Notes* and any other related Installation Guides, Release Notes, Read Before Installing Guides, or READMEs before beginning an installation. Requirements and known issues for individual products included in the HP Serviceguard Storage Management Suite bundles are documented in their respective Release Notes. See “Documentation for this Version” (page 22) for information on SG SMS related documentation.



NOTE: For information on devices that are supported with HP Serviceguard Storage Management Suite products, see *Device Support for Veritas Products on HP-UX*, available at: <http://docs.hp.com/en/oshpux11iv2.html>

Upgrading to a Different SG SMS Bundle

Upgrades to HP Serviceguard Storage Management Suite bundles can fall into any one of three categories:

- **Rolling Upgrade** - The upgrade is done **online**. This means individual cluster nodes can leave the cluster, be upgraded, and re-join the cluster one at a time. At no time will the entire cluster be halted. Until the last cluster node is upgraded, nodes with different versions of SG SMS can be running in the cluster.
- **Offline Upgrade** - The cluster nodes must be taken **offline** and all nodes must be upgraded with the same SG SMS bundle - for an alternative offline upgrade procedure that minimizes

downtime, see “Cluster Offline Upgrade Option for SG SMS Bundles Containing CVM/CFS” (page 27).

- **Uninstall** - The currently installed SG SMS bundle must be uninstalled before a new SG SMS bundle can be installed, then the software must be reconfigured (the cluster must also be reconfigured, if a CVM/CFS bundle is installed).

Table 1-5 shows all supported upgrade paths - these upgrade paths do not require an uninstall of the current SG SMS product version. Any change from one SG SMS product to another that is not represented in Table 1-5 will require an uninstall of the current SG SMS product. Keep the following guidelines in mind when viewing Table 1-5:

The arrows (→) in the rows in Table 1-5 show the supported upgrade paths for various SG SMS bundles:

- The SG SMS version number (for example, A.02.00), and dependencies (HP-UX version, Serviceguard version, Veritas™ Storage Foundation version), are listed at the top of the column for each SG SMS version - followed by the bundle product numbers that are available within that SG SMS version, (for example, T2771CA).
- You can do rolling upgrades of any SG SMS bundles within the same horizontal row if the letter **R** is in the upgrade path.

Starting with SG SMS version A.02.00 to A.02.01 upgrades, rolling upgrades of SG SMS bundles that include Veritas™ Cluster Volume Manager (CVM) or Cluster File System (CFS) are allowed if only the Serviceguard version changes, and the HP-UX and Veritas/Symantec Storage Foundation versions remain the same.

- Upgrade paths that require an Offline Upgrade, are indicated by the letter **O**.
- “Skipping ahead” within the row, for example, upgrading from a SG SMS version A.01.00 T2771BA bundle to a SG SMS version A.02.01 T2771CA bundle, is supported only if all of the upgrade paths between the currently installed SG SMS version and the SG SMS version you want to upgrade to are marked with an **R**.



NOTE: Table 1-5 (page 25), is current as of the publication date of these Release Notes. The most recent information on supported bundle upgrade paths is available in the *HP Serviceguard Storage Management Suite Bundles - Supported Upgrade Paths Matrix* available in the *Support Matrixes* section at: <http://docs.hp.com/en/ha.html#HP%20Serviceguard%20Storage%20Management%20Suite>

- Upgrade paths that are not listed in Table 1-5 will require an uninstall of the SG SMS bundle, before a different SG SMS bundle can be installed and configured.

Table 1-5 Supported SG SMS Bundle Upgrade Paths - HP-UX 11i v2 Only

SG SMS Version	A.01.00		A.01.01		A.02.00		A.02.01		A.02.01.01
HP-UX Version	11i v2		11i v2		11i v2		11i v2		11i v2
Serviceguard Version	A.11.17		A.11.18		A.11.18		A.11.19		A.11.19
Veritas SF Version	4.1		4.1		5.0		5.0		5.0
SG Storage Mgmt	T2771BA	R →	T2771BA	R →	T2771CA	R →	T2771CA	R →	T2771CA
SG Storage Mgmt Premium	T2772BA	R →	T2772BA	R →	T2772CA		1		1
SG Storage Mgmt for Oracle	T2773BA	R →	T2773BA	R →	T2773CA	R →	T2773CA	R →	T2773CA

Table 1-5 Supported SG SMS Bundle Upgrade Paths - HP-UX 11i v2 Only (continued)

SG SMS Version	A.01.00		A.01.01		A.02.00		A.02.01		A.02.01.01
HP-UX Version	11i v2		11i v2		11i v2		11i v2		11i v2
Serviceguard Version	A.11.17		A.11.18		A.11.18		A.11.19		A.11.19
Veritas SF Version	4.1		4.1		5.0		5.0		5.0
SG Storage Mgmt Oracle Prem	T2774BA	R →	T2774BA	R →	T2774CA	R →	T2774CA	R →	T2774CA
SG Cluster File System	T2775BA	O →	T2775BA	O →	T2775CA	R→	T2775CA	R→	T2775CA
SG Cluster File System Oracle	T2776BA	O →	T2776BA	O →	T2776CA		2		2
SG Cluster File System RAC	T2777BA	O →	T2777BA	O →	T2777CA	R→	T2777CA	R→	T2777CA
MCOE w/ SG SMS Oracle Prem	T2794BA	O →	T2794BA	R →	T2794CA	R →	T2794CA	R →	T2794CA
MCOE w/ SG SMS CFS	T2795BA	O →	T2795BA	O →	T2795CA	R→	T2795CA	R→	T2795CA
MCOE w/ SG SMS CFS Oracle	T2796BA	O →	T2796BA	O →	T2796CA	R→	T2796CA	R→	T2796CA
MCOE w/ SG SMS CFS RAC	T2797BA	O →	T2797BA	O →	T2797CA	R→	T2797CA	R→	T2797CA

1 The T2772CA bundle is no longer available, starting with the SG SMS version A.02.01 release. Use the T2774CA bundle instead.

2 The T2776CA bundle is no longer available as a “stand-alone” bundle starting with the SG SMS version A.02.01 release. Use the T2777CA bundle instead. The T2776CA bundle is only available as a component of the T2796CA MCOE bundle.



NOTE: If a newly installed bundle includes the same version of a product that was previously installed and patched, the patches may need to be installed again.

NOTE: If there is a cluster configured on a node, the `swremove` command will not let you remove SG SMS from that node. You must halt the node, remove the node from the cluster, and then use `swremove` to remove SG SMS.

Disabling Cluster Auto-Start on Reboot

Before attempting a SG SMS bundle installation or upgrade, you must disable `AUTOSTART_CMCLD`.

To disable `AUTOSTART_CMCLD` on all cluster nodes, edit the `/etc/rc.config.d/cmcluster` file to set `AUTOSTART_CMCLD` to 0, (`AUTOSTART_CMCLD=0`).

To re-enable Automatic startup (`AUTOSTART_CMCLD`) after completing your SG SMS bundle installation or upgrade, set the flag `AUTOSTART_CMCLD` to 1 in the `/etc/rc.config.d/cmcluster` file (`AUTOSTART_CMCLD=1`)

For more information on `AUTOSTART_CMCLD`, see the *Setting up Autostart Features and Performing a Rolling Upgrade* sections in *Managing Serviceguard, Fifteenth Edition*, available at <http://docs.hp.com> > High Availability > Serviceguard.

Cluster Offline Upgrade Option for SG SMS Bundles Containing CVM/CFS

To upgrade a SG SMS CFS bundle (T2775xx, T2776xx, or T2777xx) where the supported upgrade path in Table 1-5 (page 25) indicates an offline upgrade is required, there is a procedure that may work with your configuration to minimize the time that the entire cluster is offline. This is accomplished by performing an *offline* upgrade on half of the cluster nodes while the other half of the cluster nodes remain *online*.

This cluster offline upgrade procedure considers the upgrade of SG SMS only. You need to take responsibility for applications that run in the SG SMS cluster you plan to upgrade. Before starting this procedure, make certain your computing environment and the applications running on top of SG SMS in the cluster can accommodate being offline temporarily.

Offline Upgrade Procedure:

Divide the cluster nodes into two groups. For purposes of explanation, we will refer to these groups of nodes as Group A and Group B. In explaining this procedure we assume groups of equal size will be the most efficient approach. It is not necessary to divide the cluster nodes into groups of equal size, if some other arrangement will work better in your computing environment.

- If the cluster has an even number of nodes, assign half of the nodes to Group A and the other half to Group B.
- If the cluster has an odd number of nodes, subtract one node from the total number of nodes, divide that number in half, then assign the resulting number of nodes to Group A. Assign the remaining, larger group of nodes to Group B. For example, if the cluster contains 9 nodes, assign $(9 - 1)/2 = 4$ nodes to Group A, and assign the remaining 5 nodes to Group B.

We will use a 3 node cluster as an example for explaining this offline upgrade procedure. For a 3 node cluster, Group A will contain Node 1, and Group B will contain Node 2 and Node 3.



NOTE: Steps 1, and 2 in this procedure can be performed on multiple nodes in parallel, or on one node at a time, before continuing to step 3.

1. Move all application failover packages that can be moved from Group A nodes, to Group B nodes.
2. Halt the Group A cluster nodes and upgrade them to the new SMS version:
 - a. Node 1 > **cmhaltnode -f node1**
 - b. Perform an offline upgrade of the Group A nodes (Node 1 in this example).
3. Gracefully halt application packages running on Group B nodes, before halting the cluster on the Group B nodes.
4. Halt the cluster on the Group B nodes:
 - a. Node 2 or Node 3 > **cmhaltc1 -f**
5. Start the cluster on the Group A cluster nodes (these are the nodes where the SG SMS version has already been upgraded):
 - a. Node 1 > **cmruncl -f -n node1**



NOTE: Steps 6, 7, and 8 in this procedure can be performed on multiple nodes in parallel, or on one node at a time, before continuing to step 9.

6. Perform an offline upgrade of the Group B nodes (Node 2 and Node 3) to SG SMS version A.03.00 (the same SG SMS version that the Group A nodes were upgraded to).
7. Re-join the Group B nodes to the cluster, one at a time:
 - a. Node 2 > **cmrunnode node2**
 - b. Node 3 > **cmrunnode node3**

8. Redistribute the application failover packages over ALL of the active cluster nodes (Group A and Group B nodes).
9. Optional steps must be performed on the CVM master/CFS primary nodes to upgrade to the new CVM and CFS protocol/layout versions (refer to the VxVM and VxFS Administrators Guides for details):
 - `vxctl upgrade` to upgrade CVM protocol version
 - `vxvg upgrade <diskgroup>` to upgrade disk group version
 - `vxupgrade <mountpoint>` to upgrade to new file system layout version

Other Supported Bundle Change and Installation Scenarios

- Installing HP Serviceguard Extension for RAC on top of Storage Management Suite bundle T2776CA is supported.

Unsupported Bundle Change and Installation Scenarios

- Installing Storage Management Suite on top of HP Serviceguard Extension for RAC is not supported.

If you have the two as separate products, install the Storage Management Suite bundle T2776CA first, then install HP Serviceguard Extension for RAC.



NOTE: For current information on Serviceguard and HP-UX versions that are supported with various SG SMS versions, see the

HP Serviceguard/SGeRAC/Storage Management Suite/Serviceguard Manager Plug-in Compatibility and Feature Matrix at:

<http://docs.hp.com/en/5971/SG-SGeRAC-SMS-EMS%20Support.pdf>

HP Serviceguard Storage Management Suite Compatibility with HP-UX Releases

There are two different HP Serviceguard Storage Management Suite Version A.02.01 releases, one for HP-UX 11i v2 and one for HP-UX 11i v3:

- HP Serviceguard Storage Management Suite Version A.02.01 bundles designated “TxxxxCA” are compatible with HP-UX 11i v2
- HP Serviceguard Storage Management Suite Version A.02.01 bundles designated “TxxxxCB” are compatible with HP-UX 11i v3



NOTE: HP-UX 11i v2 is supported with up to 64k lunpaths, however, Veritas™ products included in the SG SMS Version A.02.01 bundles limit SG SMS lunpath support to a maximum of 32k lunpaths on HP-UX 11i v2.

System Requirements

HP Serviceguard Storage Management Suite bundles run on HP 9000 or HP Integrity Servers. Using both types of servers in the same cluster is supported.

Disk Requirements

Installation of any HP Serviceguard Storage Management Suite bundle requires a minimum of 550 MB of disk space in the root file system.

Before Installing HP Serviceguard Storage Management Suite Version A.02.01

Before installing an HP Serviceguard Storage Management Suite bundle, consult with your HP representative to make sure that the cluster has the correct hardware upgrades and supported

firmware revisions. Also check for any updated patch requirements for the software products being installed.

Patches for HP products and Veritas™ products included in the HP Serviceguard Storage Management Suite bundles can be downloaded at: www.hp.com/go/sgsms/patches



NOTE: Before attempting a SG SMS bundle installation or upgrade, you must disable `AUTOSTART_CMCLD`. See “Disabling Cluster Auto-Start on Reboot” (page 26)

Installing HP Serviceguard Storage Management Suite

To install software, run the SD-UX `swinstall` command. It will invoke a user interface that will lead you through the installation. For additional information and tips on installing HP-UX and HP applications see the *HP-UX 11i Version 2 Installation and Update Guide* available at: <http://docs.hp.com> in the *HP-UX 11i v2 Operating Environment* section.

For information on installing Veritas products including VxVM or VxFS, see the *Veritas 5.0 Installation Guide* included on the HP Serviceguard Storage Management Suite media and also available at: <http://docs.hp.com> - see VxFS and VxVM in the *HP-UX 11i v2 Operating Environment* section.

Installation of an HP Serviceguard Storage Management Suite bundle automatically handles dependencies on base-VxFS and base-VxVM as well as between products included in the bundles.

Installation steps should be performed in the following order:

1. If you are doing an **offline upgrade**, shutdown the cluster.
If you are doing a **rolling upgrade**, halt only the node that is currently being upgraded.
2. HP-UX 11i v2 (with all required patches) is required for loading an HP Serviceguard Storage Management Suite bundle.
 - If the system has a pre-5.0 version of Veritas Volume Manager already installed, the installation process overwrites that version of the product.
 - If any stand alone (not SG SMS) version of Veritas™ Cluster Volume Manager (CVM) is installed, it must be removed before an HP Serviceguard Storage Management Suite bundle can be installed.
3. Install the HP Serviceguard Storage Management Suite bundle. For bundles T2771CA, T2773CA, T2774CA, T2775CA, or T2777CA, use the Serviceguard and Storage Management Products media.



NOTE: When an upgrade of a SG SMS Operating Environment bundle (T8684CB, T8685CB, T8686CB, T8687CB, T8694CB, T8695CB, T8696CB, T8697CB) includes a different Serviceguard version than the one that is currently installed, a different procedure than the one described in this step is necessary, see “How to Upgrade MCOE Bundles (T2794CA, T2795CA, T2796CA, and T2797CA) to SG SMS Version A.02.01” (page 32) for additional information.

Use the appropriate bundle product number in place of T27xxCA. This installation will reboot the system once:

```
swinstall -x autoreboot=true -s <depot> T27xxCA
```

The default setting for installation of the bundle is “`reinstall=false`” which preserves any existing installation of the same version of a product.

4. After installation of the software, and one reboot is completed, apply any required product patches.

During the initial reboot and until all required patches are applied, various startup errors may be reported.

- a. Go to <http://www.hp.com/go/SG SMS/patches>, for patches required for the HP Serviceguard Storage Management Suite version you are installing.
 - b. Follow any special instructions included with the patches.
 - c. Download the patches into a single file, extract the contents, and create a single depot using the instructions included with the download.
 - d. Install the patches using the option “`patch_match_target=true`”.
This ensures that only the patches from the depot that match the installed bundle are installed.
5. If this is a new installation, and the installation of any required product patches is completed, run `vxinstall`.
- If `vxinstall` has already been run on the systems, this step may be skipped.
- This procedure completes initialization steps for:
- Veritas software prompting for Veritas licenses (use the default response - no)
 - specification of a default disk group
 - using enclosure-based naming
- For information on `vxinstall`, see the *Veritas 5.0 Installation Guide*.
6. Verify a successful installation. Use the appropriate bundle product number in place of T27xxCA, as follows: `swverify T27xxCA`
 7. List components installed with: `swlist -l product`
 8. If you have additional nodes in the cluster, repeat all steps for each node in the cluster. For rolling upgrades, each node can rejoin the cluster after being upgraded. For offline upgrades and new installations, start the cluster after all nodes have been installed or upgraded.

9. For new installations you will need to create an HP Serviceguard Storage Management Suite cluster, see *Managing Serviceguard* for details on configuring the cluster. A high-level summary of the steps involved in using the Cluster File System includes:
 - a. Create and start a Serviceguard cluster without a package using Serviceguard Manager or CFS commands (`cmquerycl`, `cmcheckconf`, `cmapplyconf`, `cmruncl`).
 - b. Configure and start the CFS system multi-node package `SG-CFS-pkg` using Serviceguard Manager or the `cfscluster` command.
 - c. Create the disk groups and volumes on the CVM master node using Veritas Enterprise Administrator (VEA) or VxVM / VxFS commands (`vxvdxg`, `vxassist`, `newfs`).
 - d. Add the CVM disk groups and CFS file systems to the Serviceguard cluster.



NOTE: You can also add CVM disk groups and CFS file systems to a Serviceguard cluster using the Veritas Enterprise Administrator (VEA) GUI for HP-UX.

- Use the `cfsdgadm` command to create the disk group multi-node package (for example, `SG-CFS-DG-1`).
- Then use the `cfsmntadm` command to create the mount point multi-node package (for example, `SG-CFS-MP-1`) on the disk group multi-node package (`SG-CFS-DG-1`).
- Once a CFS disk group or mount point is configured under a package, it is important to use CFS commands so the CFS packages monitor the disk group and mount points.

For example, use the `cfsmount` command to mount these filesystems - not the `mount` HP-UX command.

- e. Complete configuration.
 - Create the application package configuration file and control script.
 - Specify a same-node dependency on the mount point multi-node package (`SG-CFS-MP-1`) in the package configuration file using CFS commands (`cmmakepkg`, `edit` files).
 - Verify, distribute, and apply the configuration using CFS commands (`cmcheckconf`, `distribute` files, `cmapplyconf`).
- f. Activate the multi-node packages and run the application packages using CFS commands (`cfsdgadm`, `cfsmntadm`, `cmrunpkg`).

Software Components Installed with HP Serviceguard Storage Management Suite

The software components installed with the HP Serviceguard Storage Management Suite bundles are listed in Table 1-6: “Software Components and Associated Bundles”.

Table 1-6 Software Components and Associated Bundles

Bundle Tag: <code>swlist -l product</code> command output	Software Component Description	T	T	T	T	T	T
		2	2	2	2	2	2
		7	7	7	7	7	7
		7	7	7	7	7	7
		1	3	4	5	6	7
		C	C	C	C	C	C
		A	A	A	A	A	A
T1905CA	HP Serviceguard	X	X	X	X	X	X
EventMonitoring	HP Event Monitoring Service (EMS)	X	X	X	X	X	X
T1909BA	Enterprise Cluster Master Toolkit (ECMT)	X	X	X	X	X	X

Table 1-6 Software Components and Associated Bundles (continued)

Bundle Tag: swlist -l product command output	Software Component Description	T 2 7 7 1 C A	T 2 7 7 3 C A	T 2 7 7 4 C A	T 2 7 7 5 C A	T 2 7 7 6 C A	T 2 7 7 7 C A
Base-VxFS-50 (B.05.00.02)	Base Veritas File System 5.0 for HP-UX (also known as OnlineJFS)	X	X	X	X	X	X
Base-VxVM-50 (B.05.00.02)	Base Veritas Volume Manager Bundle 5.0 for HP-UX	X	X	X	X	X	X
Base-VxTools-50 (B.05.00.02)	VERITAS Infrastructure Bundle 5.0 for HP-UX	X	X	X	X	X	X
VRTSfsdoc	Veritas File System Documentation	X	X	X	X	X	X
VTRSjre15	Symantec JRE Redistribution	X	X	X	X	X	X
VRTSperl	Perl 5.8.8 for Veritas	X	X	X	X	X	X
VRTSvail	Veritas Array Providers by Symantec	X	X	X	X	X	X
VRTSweb	Symantec Web Server Redistribution	X	X	X	X	X	X
VRTSdbed	Veritas Storage Foundation for Oracle by Symantec		X	X		X	X
VRTSodm	Veritas Oracle Disk Manager		X	X		X	X
VRTSmapro	Symantec Storage Foundation GUI for Mapping		X	X		X	X
VRTSdbms3	Symantec Shared DBMS		X	X		X	X
VRTSdbcom	Veritas Storage Foundation for Database Common Utilities from Symantec		X	X		X	X
VRTSgab	Veritas Group Membership and Atomic Broadcast by Symantec				X	X	X
VRTSglm	Veritas Group Lock Manager				X	X	X
VRTSllt	Veritas Low Latency Transport by Symantec				X	X	X
VRTSvxfen	Veritas Fencing by Symantec				X	X	X
VRTSdbdoc	Veritas Storage Foundation for Oracle Documentation from Symantec		X	X			
VRTSorgui	Veritas Storage Foundation GUI for Oracle from Symantec		X	X			
VRTSgms	Veritas Group Messaging Service					X	X
T1907BA	SGeRAC						X

How to Upgrade MCOE Bundles (T2794CA, T2795CA, T2796CA, and T2797CA) to SG SMS Version A.02.01

Gaining Access to the Required Software

Version A.02.01 of the T2794CA, T2795CA, T2796CA, and T2797CA SG SMS MCOE bundles requires the following software, which is not on the SG SMS version A.02.01 media:

- Serviceguard A.11.19
- ECMT B.05.00

Typically these software products are delivered with new versions of HP-UX 11i v2 MCOE media, but the latest HP-UX 11i v2 MCOE media (December 2007) was created before the T2794CA, T2795CA, T2796CA, and T2797CA SG SMS version A.02.00 MCOE bundles, and it does not contain the required versions of Serviceguard and ECMT.

New versions of Serviceguard and ECMT are delivered on the Application Release (AR) media. The most recent HP-UX 11i v2 AR media contains the versions of Serviceguard and ECMT, which are required to upgrade or newly install any of the SG SMS version A.02.01 MCOE bundles.

Building a Common Depot for the Installation

The tasks in the following example are performed on a depot server (in the example, the name of the depot server is **sw-depot.hp.com**):

1. Copy the SG SMS product (for example, T2795CA) and the required VxVM and VxFS software from the SG SMS version A.02.01 media (mounted at `/mnt/SMS.depot`) to the installation depot (`/mnt/install.depot`) residing on the depot server.

```
$ swcopy -x enforce_dependencies=false -s /mnt/SMS.depot Base-VxFS-50 Base-VxVM-50 T2795CA @ /mnt/install.depot
```

2. Copy Serviceguard (T1905CA) and ECMT (T1909BA) from the latest AR media mounted at `/mnt/AR.depot` to the installation depot `/mnt/install.depot`:

```
$ swcopy -x enforce_dependencies=false -s /mnt/AR.depot T1905CA T1909BA @ /mnt/install.depot
```

Performing the Installation or Upgrade

1. Shutdown the cluster or shutdown an individual node (depending on whether you are doing offline or rolling upgrade).
2. Install the software from the installation depot on all cluster nodes (either in parallel for offline upgrades, or one at a time for rolling upgrades) running the following command on each cluster node:

```
$ swinstall -x autoreboot=true -s sw-depot.hp.com:/mnt/install.depot Base-VxFS-50 Base-VxVM-50 T1905CA T1909BA T2795CA
```

3. After the software has been successfully installed on all of the cluster nodes:
 - If an offline upgrade was performed, the cluster can be restarted.
 - If a rolling upgrade was performed, each upgraded node can rejoin the cluster as soon the upgrade is completed. See Table 1-5 (page 25) for upgrade paths that support rolling or offline upgrades.

Removing HP Serviceguard Storage Management Suite

The SD-UX `swremove` command is used to uninstall the HP Serviceguard Storage Management Suite software. The `swremove` command must be issued on one system at a time.



NOTE: Before attempting to remove a SG SMS bundle:

- Follow any guidelines for software removal of the individual products included in the HP Serviceguard Storage Management Suite bundle. In general, products should be halted and unconfigured before removal.
- If any independently installed products have installation dependencies on a product in the installed SG SMS bundle, these products must be removed before the bundle can be removed. For example, if SGeRAC was independently installed on a system with Bundle T2776CA, SGeRAC must be removed before T2776CA can be removed since SGeRAC has dependencies on Serviceguard and removing T2776CA will remove Serviceguard but not SGeRAC.
- Removing an HP Serviceguard Storage Management Suite bundle removes the individual bundle tags associated with that bundle (see Table 1-6 (page 31)) except for Base-VXFS and Base-VXVM. These products must be individually specified for removal. For example, to remove the contents of T2771CA including Base-VXFS and Base-VXVM enter:

```
swremove -x autoreboot=true Base-VXFS-50 Base-VxVM-50 Base-VxTools-50 T2771CA
```

The following steps provide the general procedure to remove a SG SMS bundle:

1. Use Serviceguard Manager or Serviceguard commands to halt the node.
2. Use Serviceguard Manager or Serviceguard commands to remove the node from any package configuration it is part of.
3. If the node is part of a cluster, modify the CFS storage and related package configuration as needed to fully remove the node from the cluster.
4. Run the `swremove` command.
5. Verify all components have been removed - use the `swlist` command on one system at a time.

If the system is left with a zero-length binary configuration file (`/etc/cmcluster/cmclconfig`), remove it.

Patches and Fixes in this Version

This section describes patches that are required and defects that have been fixed in HP Serviceguard Storage Management Suite Version A.02.01 for HP-UX 11i v2.

Fixes

This is a release of the HP Serviceguard Storage Management Suite bundles. Individual products may have fixes from their previous versions. Consult the individual product Release Notes for details.

Required Patches

Table 1-7, lists the patches required for HP Serviceguard Storage Management Suite Version A.02.01 on HP-UX 11i v2.

Individual products included in HP Serviceguard Storage Management Suite bundle or other products installed on your system may require additional patches. This list is subject to change without notice. Contact your HP support representative for up-to-the-moment information.

Patches can be superseded or withdrawn at any time, so always be sure to check the status of any patch before downloading it at the Hewlett-Packard IT Resource Center (ITRC) web site:

<http://itrc.hp.com> (Americas and Asia Pacific)[LINEBREAK]<http://europe.itrc.hp.com> (Europe)

The patches in Table 1-7 and additional patches required for Serviceguard are available from <http://www.hp.com/go/sgsms/patches> or by searching for individual patches on the ITRC.

Download the patches into a single depot and install using the option

`"patch_match_target=true"`. This will install only the patches from the depot that match

the installed bundle. Follow any special instructions included with the patches. Access to these patches requires a valid support contract and login to the ITRC. These patches are also available from your HP support representative.

Table 1-7 Required Patches and Associated Bundles

Patch Number	Description	T 2 7 7 1 C A	T 2 7 7 3 C A	T 2 7 7 4 C A	T 2 7 7 5 C A	T 2 7 7 6 C A	T 2 7 7 7 C A
PHCO_35125	VRTS 5.0 MP1 VRTSddlpr Cmd Patch	X	X	X	X	X	X
PHCO_35126	VRTS 5.0 MP1 VRTSalloc Cmd Patch	X	X	X	X	X	X
PHCO_37077	VRTS 5.0 MP1RP2 VRTSdcli Cmd Patch	X	X	X	X	X	X
PHCO_37085	VRTS 5.0 MP1RP2 VRTSvmpro Cmd Patch 02	X	X	X	X	X	X
PHCO_37086	VRTS 5.0 MP1 VRTSvxvm Cmd Patch 02	X	X	X	X	X	X
PHCO_35213	VRTS 5.0 MP1 VRTSobc33 Cmd Patch	X	X	X	X	X	X
PHCO_35214	VRTS 5.0 MP1 VRTSobjui Cmd Patch	X	X	X	X	X	X
PHCO_35217	VRTS 5.0 MP1 VRTSmh Cmd Patch	X	X	X	X	X	X
PHCO_35301	VRTS 5.0 MP1 VRTSat Cmd Patch	X	X	X	X	X	X
PHCO_37114	VRTS 5.0 MP1RP2 VRTSvxfs Cmd Patch	X	X	X	X	X	X
PHCO_35357	VRTS 5.0 MP1 VRTSmapro Cmd Patch	X	X	X	X	X	X
PHCO_35375	VRTS 5.0 MP1 VRTSfsman Cmd Patch	X	X	X	X	X	X
PHCO_36590	VRTS 5.0 MP1 VRTSob Cmd Patch	X	X	X	X	X	X
PHCO_36591	VRTS 5.0 MP1 VRTSaa Cmd Patch	X	X	X	X	X	X
PHCO_36592	VRTS 5.0 MP1 VRTSccg Cmd Patch	X	X	X	X	X	X
PHCO_36593	VRTS 5.0 MP1 VRTSfspro Cmd Patch	X	X	X	X	X	X
PHKL_37087	VRTSvxvm 5.0 Kernel Patch 03	X	X	X	X	X	X
PHCO_38187	VRTS 5.0 MP1RP3 VRTSvxvm Cmd Patch 03	X	X	X	X	X	X
PHKL_38188	VRTSvxvm 5.0 MP1RP3 Kernel Patch 04	X	X	X	X	X	X
PHKL_37113	VRTS 5.0 MP1RP2 VRTSvxfs Kernel Patch	X	X	X	X	X	X
PHKL_35284	VRTS 5.0 MP1 VRTSodm Cmd Patch		X	X		X	X
PHNE_35783	VRTS 5.0 MP1 VRTSgab Cmd Patch				X	X	X
PHNE_36509	VRTS 5.0 MP1 VRTSllt Cmd Patch				X	X	X
PHKL_35424	VRTS 5.0 MP1 VRTSvxfen Cmd Patch				X	X	X
PHKL_35312	VRTS 5.0 MP1 VRTSglm Cmd Patch				X	X	X
PHCO_37380	VRTS 5.0 MP1CP1 VRTSvxfen Cmd Patch				X	X	X
PHCO_35354	VRTS 5.0 MP1 VRTSdbed Cmd Patch, Veritas Database Utilities for Oracle		X	X			
PHCO_36226	VRTS 5.0 MP1 VRTSdbcom Cmd Patch		X	X			
PHCO_36230	VRTS 5.0 MP1 VRTSorgui Cmd Patch		X	X			

Product Issues and Limitations

This section provides information on known issues and limitations for the HP Serviceguard Storage Management Suite Version A.02.01 HP-UX 11i v2 bundles at the time of this release. For the most recent information contact your HP support representative or the Hewlett-Packard IT Resource Center.

Guidelines for CFS Nested Mounts

A maximum of four levels of nesting is supported with CFS nested mounts. VxFS, Check Point (ckpt), and snapshot cluster file systems are supported with CFS nested mounts. However, ckpt and snapshot cluster file systems can only be mounted at the end of the nesting sequence, not at the beginning or middle of the nesting sequence. CFS admin scripts changes: With the nested mount point feature enabled, the only change in the `cfsmntadm add` command interface is to specify a nested mount point in place of a normal mount point. For example:

```
cfsmntadm add <shared_disk_group> <shared_volume> <mount_point>  
[<package_name>] <node_name>= [<mount_options>]... is now changed to:
```

```
cfsmntadm add <shared_disk_group> <shared_volume>  
<mount_point/nested_mount_point> [<package_name>] <node_name>=  
[<mount_options>]...
```

Use Case Examples

- Creating a mount point that is not nested:

```
cfsmntadm add cvm_dg1 lvol1 /cfs1 all=rw
```
- Creating a nested mount point:

```
cfsmntadm add cvm_dg1 lvol2 /cfs1/cfs2 all=rw (assuming cvm_dg1/lvol1  
is already mounted on /cfs1, /cfs1/cfs2 becomes a nested mount point)
```
- Creating a ckpt nested mount point:

```
cfsmntadm add ckpt ckpt1 /cfs1 /cfs1/ckpt1 all=ro (if /cfs1 is a CFS mount  
point, /cfs1/ckpt1 becomes a nested mount check point)
```
- Creating a snapshot nested mount point:

```
cfsmntadm add snapshot cvm_dg1 lvol3 /cfs1 /cfs1/snapshot1 snapshot1  
all=ro (if /cfs1 is a CFS mount point, /cfs1/snapshot1 becomes a nested snapshot  
mount point)
```

The mknod Command Is Not Supported with CFS

You cannot use the `mknod` command to create devices on a cluster mounted file system - attempts to use the `mknod` command will return `Invalid argument`.

SCSI-3 Persistent Reservation Support

Veritas Cluster Server (VCS) relies on SCSI-3 Persistent Reservation being supported on the storage. This is part of the Veritas split brain prevention. HP Serviceguard uses a different and more robust method to prevent split brain, there is no need for SCSI-3 Persistent Reservation on the storage.

Use of HP-UX mount Commands for CFS Environments

Once the disk group and mount point multi-node packages are created in Serviceguard, it is critical to use the CFS commands, including `cfsdgadm`, `cfsmntadm`, `cfsmount`, and `cfsunmount`. If the HP-UX commands such as `mount` and `umount` are used, it could cause serious problems such as writing to the local file system instead of the cluster file system.

Any form of the HP-UX `mount` command (for example, `mount -o cluster, dbed_chkptmount, orsfrac_chkptmount`) **must not be used** in an HP Serviceguard Storage Management Suite with CFS environment. These non-CFS commands could cause conflicts with subsequent CFS command operations on the file system or the Serviceguard packages. Use of HP-UX `mount` commands will not create an appropriate multi-node package, which means cluster packages will not be aware of file system changes. Always use the CFS commands `cfsmount` or `cfsumount`.

ODM Must be Used for Oracle RAC Data on CFS File Systems

ODM - Oracle Disk Manager is included in all SG SMS Oracle bundles (T2773, T2774, T2776 and T2777). ODM must be used for Oracle RAC data on CFS file systems. ODM can also be used for Oracle standalone databases with data on VxVM volumes with VxFS file systems. ODM is not supported for use on file systems on LVM logical volumes. ODM improves the I/O performance for Oracle databases with data on VxFS and CFS file systems. The performance approaches that of Oracle data on raw disks.

Dirty Region Logging (DRL) for Mirrored Volumes

If a system failure occurs while mirrored volumes are in use, the mirrors will recover and clean up any writes that were in progress when the system failed. The Dirty Region Logging (DRL) feature tracks writes that are in progress to reduce the recovery effort after a system failure. Without DRL, the entire volume must be recovered, because there is no way to determine which blocks had writes in progress at the time of the system failure. The recovery operation is I/O intensive and can be time consuming, depending on the number of volumes and how large they are. In a clustered environment the IO performance of multiple nodes using the same volume will be impacted during recovery. HP strongly recommends that you use DRL with mirrored data volumes in a clustered environment to enable faster volume recovery. However, Oracle database volumes should be configured without DRL, because the Oracle database application keeps its own logs and does not require VxVM to maintain logs. For information on DRL and the Veritas™ SmartSync Recovery Accelerator, see the *Veritas Volume Manager 5.0 Administrator's Guide*.

HP-UX Mission Critical Operating Environment Upgrade Limitations

When you purchase an HP Serviceguard Storage Management Suite (SG SMS) Mission Critical Operating Environment (MCOE) bundle, the SG SMS software is provided on one DVD and the HP-UX MCOE is provided on a separate DVD.

The software provided on the SG SMS DVD relies on products and filesets that are provided on the MCOE DVD, including HP Serviceguard and the Veritas Storage Foundation products. Each SG SMS MCOE version has a prerequisite with a specific version of HP Serviceguard and Enterprise Cluster Master Toolkit (ECMT). Different versions of MCOE may have different version of Serviceguard and ECMT included.

The software on the SG SMS DVD is installed using `swinstall`. If an HP-UX MCOE is installed on your system and you attempt to install a SG SMS MCOE bundle that is not supported with the versions of Serviceguard and ECMT included with the HP-UX MCOE, `swinstall` will detect the incompatible software and the installation will fail.

The software on the HP-UX MCOE DVD is installed using `update-ux`. If a SG SMS MCOE bundle is installed on your system and you attempt to install or upgrade to an HP-UX MCOE version that includes Serviceguard and ECMT versions that are not supported with the SG SMS MCOE bundle, `update-ux` will detect the incompatible software and exclude Serviceguard and ECMT from the installation.

To avoid these potential installation conflicts, follow the steps in “How to Upgrade MCOE Bundles (T2794CA, T2795CA, T2796CA, and T2797CA) to SG SMS Version A.02.01” (page 32), whenever you install or upgrade a SG SMS MCOE bundle.

Oracle Disk Manager (ODM) with VxFS and LVM

- *What is the limitation?* ODM for VxFS file systems on LVM volumes is not supported.
- *What is the workaround?* Oracle Files that need ODM capability should reside on a VxFS file system created on a VxVM/CVM volume.

Oracle Disk Manager Limitation for Bundles T2776CA, T2796CA, T2777CA, and T2797CA

- *What is the limitation?* Single instance Oracle databases are not permitted outside of Serviceguard packages in environments using T2776CA, T2796CA, T2777CA, and T2797CA. If there are any Oracle instances not controlled by Serviceguard packages, a halt of the system multi-node package SG-CFS-pkg could bring down the node or cluster.
- *What is the workaround?* Place all Oracle single instances in Serviceguard packages when deploying these bundles. In addition, single instance Oracle packages using VxFS and VxVM must have a direct dependency on the system multi-node package SG-CFS-pkg.

Known Problems

This section lists known problems in the HP Serviceguard Storage Management Suite version A.02.01 for HP-UX 11i v2 at the time of publication. This list is subject to change without notice. Details or more recent information may be available from your HP support representative or the Hewlett-Packard IT Resource Center: <http://www.itrc.hp.com> (Americas and Asia Pacific) or <http://www.europe.itrc.hp.com> (Europe).

To view details on these items: Login to ITRC.hp.com -> Search Knowledge base -> enter QXCR number and search against "Engineering notes, solutions, bug reports, FAQs."

Table 1-8 Known Problems in the HP Serviceguard Storage Management Suite Version A.02.01 for HP-UX 11i v2

QXCR NUMBER	QXCR TITLE
QXCR1000555745	odm_gms_api_start_msgs fails during system startup
QXCR1000561840	Unable to open I18N message catalog
QXCR1000565864	vxumount returns device busy on master node
QXCR1000566885	VxVM 5.0 requires more space on directory for /etc/vx/cbr backup
QXCR1000570778	fsclustadm cfsdeinit device busy, package halt timeout
QXCR1000573400	lot's of vx.* directories left over in /tmp
QXCR1000583180	Diskgroup resync taking too long
QXCR1000589981	Open fails for the device /dev/vxfsen, after removing and reinstalling a Serviceguard Cluster File System (SG CFS) bundle
QXCR1000802019	vxsvc dumped a core (SIGSEVG) after cmcld was killed
QXCR1000802805	Halting SG-CFS-vxfsckd failed; cluster crashed
QXCR1000815640	vxconfigd core in memmove+0x1c
QXCR1000829877	CVM node join timed out "Waiting for CVM to stabilize"
QXCR1000832395	system panic: GAB detected network failure on long lived node
QXCR1000849095	system panic: Synchronous Notification to client cmvxpingd timed out

Documentation Errata

The following describes known problems with documentation included with HP Serviceguard Storage Management Suite Version A.02.01 and workarounds for them. This is subject to change without notice.

Veritas man page Errata

Due to the unique integration of HP Serviceguard Storage Management Suite bundles, errata for Veritas man pages includes:

- man page: llttab
 - *What is the problem?* Man page states the “llttab file must be managed by the System Administrator”. In HP Serviceguard Storage Management Suite environments Serviceguard creates, distributes, and manages this file.
 - *What is the workaround?* Ignore man page.
- man page: llthosts
 - *What is the problem?* Man Page states the “llthosts file must be managed by the System Administrator”. In HP Serviceguard Storage Management Suite environments Serviceguard creates, distributes, and manages this file.
 - *What is the workaround?* Ignore man page.
- man page: gabconfig
 - *What is the problem?* In HP Serviceguard Storage Management Suite environments Serviceguard creates, distributes, and manages gab configuration. Most options for this command are not needed.
 - *What is the workaround?* Ignore man page.

Known Problems with Veritas Storage Foundation 5.0 for Oracle Administrator’s Guide

Known problems include:

- *What is the problem?* Pages 6, 15, 553 references “VVR”.
What is the workaround? VVR is not available in HP Serviceguard Storage Management Suite Version A.02.01.
- *What is the problem?* Pages 130, 134, and 136 do not include correct file names for the Oracle Disk Manager library files on HP Integrity systems. The file names with “.so” extensions are correct for HP 9000 (PA-RISC based) systems.
What is the workaround? For HP Integrity systems, use:
 - “libodm9.so” instead of “libodm9.sl”
 - “libodmd9.so” instead of “libodmd9.sl”
 - “libodm10.so” instead of “libodm10.sl”

Software Availability in Native Languages

The HP Serviceguard Storage Management Suite Version A.02.01 does *not* provide Native Language Support. The documentation media provides a complete set of documentation in English. Individual products included in the HP Serviceguard Storage Management Suite bundles may provide Native Language Support. See the individual product release notes for availability.

A localized version of this document, the release notes, is available with the following product options:

- option ACA for English provides part number T2771-90053
- option ABJ for Japanese provides part number T2771-90054