# Serviceguard Extension for RAC Version A.11.18 Release Notes

# Legal Notices

# Printing History

# 1 Serviceguard Extension for RAC Version A.11.18 Release Notes

## Announcements

This section announces the most important features and limitations of Serviceguard Extension for RAC (SGeRAC) A.11.18. For more information, see ""What's in this Version" on page 9.

The A.11.18 version of SGeRAC is supported on HP-UX 11i v2 and 11i v3. For details refer to "HP-UX 11i v3 Updates" and "HP-UX 11i v2 Updates" on page 7.

SGeRAC (formerly known as Serviceguard OPS Edition or MC/LockManager) is a specialized facility that provides the framework for using Oracle Real Application Cluster (RAC) software on HP 9000 and HP Integrity servers.

Version A.11.18 of SGeRAC permits a maximum of 16 HP 9000 or HP Integrity servers configured as a high availability cluster. Multiple Oracle databases on the same node are supported.

SGeRAC must be used with Serviceguard, which provides general purpose clustering. Starting with version A.11.15, SGeRAC has been de-coupled from Serviceguard.

**NOTE**    Serviceguard version A.11.18 must now be installed as a prerequisite product for SGeRAC version A.11.18. The features of Serviceguard version A.11.18 are supported with the same limitations being applied. (Refer to the *Serviceguard Version A.11.18 Release Notes)*

In addition, SGeRAC version A.11.18 can be installed on top of the HP-UX 11i v2 and 11i v3 Mission Critical Operating Environment (MCOE). It is not necessary to uninstall Serviceguard filesets before installing SGeRAC.

If the version of Serviceguard in the MCOE is not A.11.18, you must first upgrade to Serviceguard version A.11.18. For Serviceguard upgrade information, refer to the *Serviceguard Version A.11.18 Release Notes*.

The following SGeRAC version and components are available with the following product numbers:

- For HP-UX 11i v2:

  — Product T1907BA—A.11.18—documentation, software and license

  — CVM/CFS 4.1:

    — Product T2777BA or T2797BA (MCOE) —A.11.18—documentation, software and license

  — CVM/CFS 5.0:

    — Product T2777CA or T2797CA (MCOE) —A.11.18—documentation, software and license

- For HP-UX 11i v3:

  — Product T1907BA—A.11.18—documentation, software and license

Since configurations for SGeRAC may be complex to configure and maintain, it is strongly recommended that you use Hewlett-Packard's high availability consulting services to ensure a smooth installation and rollout. Contact your HP representative to inquire about high availability consulting. Because there may be changes in firmware requirements as new hardware is released, you should work with your HP representative to ensure that you have the latest firmware revisions for disk drives, disk controllers, LAN controllers, and other hardware.

## HP-UX 11i v2 Updates

SGeRAC A.11.18 on HP-UX 11i v2 now supports version 5.0 of Veritas VxVM, CVM and CFS 5.0 from Symantec. See "Support for Veritas CFS and CVM on SGeRAC A.11.18" on page 12.

## HP-UX 11i v3 Updates

This release of SGeRAC A.11.18 supports HP-UX 11i v3, which introduces important improvements, particularly in regard to the I/O subsystem.

### Veritas CVM and CFS Not Yet Supported on HP-UX 11i v3

SGeRAC A.11.18 on HP-UX 11i v3 does not yet support Veritas Cluster Volume Manager (CVM) and Cluster File System (CFS) from Symantec.

If your Serviceguard cluster needs this functionality, do not upgrade to HP-UX 11i v3; Serviceguard A.11.18 is also available on HP-UX 11i v2, which supports the latest versions of CVM and CFS.

Support for Veritas Volume Manager (VxVM) Veritas (VxVM) 4.1 from Symantec are supported on HP-UX 11i v3, but VxVM 3.5 is not. If you are running VxVM 3.5 (as part of the Base Product included with HP-UX), you can do a rolling upgrade to Serviceguard A.11.18 on HP-UX 11i v3 with VxVM 4.1.

### Support for Veritas Volume Manager (VxVM)

Veritas (VxVM) 4.1 from Symantec are supported on HP-UX 11i v3, but VxVM 3.5 is not. If you are running VxVM 3.5 (as part of the Base Product included with HP-UX), you can do a rolling upgrade to Serviceguard A.11.18 on HP-UX 11i v3 with VxVM 4.1.

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**NOTE**　　　HP-UX 11i v3 does not yet support Veritas 5.0 products. A file created with VxFS 5.0 cannot be opened by the 4.1 version.

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### Native Multipathing, Veritas DMP, and Related Features

The HP-UX 11i v3 I/O subsystem provides multipathing and load balancing by default. This is often referred to as native multipathing. Veritas Volume Manager (VxVM) version 4.1 and Dynamic Multipathing

(DMP) from Symantec are supported on HP-UX 11i v3, but do not provide multipathing and load balancing; DMP acts as a pass-through driver, allowing multipathing and load balancing to be controlled by the HP-UX I/O subsystem instead.

When you upgrade a system to HP-UX 11i v3, the I/O subsystem by default will start performing load balancing and multipathing for all multipath devices (whether or not they are managed by VxVM/DMP, and whether or not you decide to migrate the system to agile addressing); you do not have to take any additional steps to make this happen.

For more information about multipathing in HP-UX 11i v3, see the white paper *HP-UX 11i v3 Native Multipathing for Mass Storage*, and the *Logical Volume Management volume of the HP-UX System Administrator's Guide* in the HP-UX 11i v3 Operating Environments collection at **http://docs.hp.com**.

# What's in this Version

The A.11.18 version of Serviceguard Extension for RAC (SGeRAC) is a release that supports the use of the HP-UX 11i v2 and 11i v3 operating systems, and provides the following additional features and restrictions:

- Support for Cluster Interconnect Subnet Monitoring.

- Support for Veritas CFS and CVM on SGeRAC A.11.18.

- Support for Oracle 9i RAC on CFS and CVM.

- Support for Oracle 10g RAC on CFS and CVM.

- Support for the SGeRAC Toolkit.

- Support for HP-UX 11i v2 and 11i v3 on HP 9000 and HP Integrity servers.

- Support for Online Volume Reconfiguration and Online Node Addition and Deletion with CFS 4.1 (or later) and CVM 4.1 (or later), and CVM version 3.5.

- Support for CFS 4.1 (or later) and CVM 4.1 (or later) in clusters up to 8 nodes.

- Support for CVM version 3.5 in clusters up to 8 nodes.

- Support for a maximum of 16-nodes in a cluster when Shared LVM is used.

- Hostnames for SGeRAC cluster nodes can be up to 39 characters (bytes) long. (The former limit was 31 characters.)

- SLVM subsystem on HP-UX 11i v2 only supports hostnames up to 31 characters (bytes) long within the SGeRAC configuration.

**NOTE**    The cluster node name of a SLVM volume group will be shown in the `vgdisplay` command output as the first 30 characters plus a '*' character if the hostname is larger than 31 characters.

- Support for 8192 Oracle Server Processes for Oracle 9i RAC.

- Support Oracle 9.2 RAC and 10.2 RAC.

- Starting with version A.11.17, all log messages from cmgmsd will log to /var/adm/syslog/syslog.log by default.

- All nodes in a cluster running SGeRAC must have SGeRAC installed. Mixed clusters of Serviceguard/SGeRAC are not supported.

  Starting with Serviceguard/SGeRAC version A.11.17 this homogeneity requirement is enforced at cluster creation and formation.

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**NOTE**    The enhancement in version A.11.17 or later will perform the homogeneity check to verify the nodes are either all SGeRAC or Serviceguard nodes without any manual intervention.

For versions prior to A.11.17, there is no homogeneity check during a rolling upgrade to A.11.17.

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- Rolling upgrade is not supported from releases prior to version A.11.15

- SGeRAC does not support a rolling upgrade from Cluster Volume Manager (CVM) version 3.5 to either Cluster Volume Manager (CVM) version 4.1 or 5.0.

- SGeRAC does not support a rolling upgrade from Cluster Volume Manager (CVM) version 4.1 to Cluster Volume Manager (CVM) version 5.0.

- Serviceguard Extension for RAC does not support Mixed Clusters.

  Mixed clusters. All cluster nodes must be either HP 9000 or HP Integrity servers, but not both in the same cluster.

For a complete list of Serviceguard A.11.18 features and limitations, refer to the *Serviceguard Version A.11.18 Release Notes* at **http://docs.hp.com** -> High Availability -> Serviceguard -> Release Notes

## Support for Cluster Interconnect Subnet Monitoring

In SGeRAC, the Cluster Interconnect Subnet Monitoring feature is used to monitor cluster communication subnets. This feature requires the use of a package configuration parameter known as the CLUSTER_INTERCONNECT_SUBNET. It can be set up to monitor certain subnets used by applications that are configured as Serviceguard multi-node packages with the following restrictions:

• Cluster Interconnect subnet monitoring can support up to 4 nodes.

• Only one CLUSTER_INTERCONNECT_SUBNET can be specified per multi-node package.

The CLUSTER_INTERCONNECT_SUBNET parameter works similar to the existing SUBNET package configuration parameter. The most notable difference is in the failure handling of the subnets monitored using these individual parameters. While the failure of subnets monitored using SUBNET package configuration parameter is handled by halting the instance of the package on the node where the subnet has failed, the failure of subnets monitored using CLUSTER_INTERCONNECT_SUBNET package configuration parameter is handled by ensuring at least one instance of the package remains running in the cluster.

**NOTE**    A package with the CLUSTER_INTERCONNECT_SUBNET parameter is available for both *Modular* and *Legacy* packages. A package with this parameter can be configured only when all nodes of the cluster are running SGeRAC version A.11.18 or higher. For more information, see the *Managing Serviceguard Fourteenth Edition* user's guide at **http://docs.hp.com** -> High Availability -> Serviceguard

## Support for Veritas CFS and CVM on SGeRAC A.11.18

SGeRAC A.11.18 on HP-UX 11i v2 supports Veritas VxVM, CVM and CFS 5.0 from Symantec, with the following exceptions:

- SGeRAC supports a maximum of eight nodes for CVM and CFS.

- SGeRAC does not support CFS nested mounts.

For more information, see the *HP Storage Management Suite Version A.02.00 Release Notes* (T2771-90036) at **http://docs.hp.com** -> High Availability -> HP Serviceguard Storage Management Suite.

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| **NOTE** | If your Serviceguard cluster needs CVM and CFS, do not upgrade to HP-UX 11i v3; Serviceguard A.11.18 is also available on HP-UX 11i v2, which supports the latest versions of CVM and CFS. See the *HP Storage Management Suite Version A.01.01 Release Notes* (T2771-90030). |

Serviceguard Extension for Faster Failover, which is not supported with earlier versions of CVM and CFS, is supported with CVM and CFS 5.0.

Serviceguard NFS Toolkit supports CFS 5.0. See the white paper *Serviceguard NFS Toolkit Support for CFS* available from **http://docs.hp.com** -> High Availability -> Highly Available NFS -> White Papers.

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| **NOTE** | On HP-UX releases that support Veritas CFS and CVM; For See "About Veritas CFS and CVM" on page 13. |

SGeRAC ships the system multi-node package SG-CFS-pkg for CVM/CFS 4.1 or later. The older system multi-node package, VxVM-CVM-pkg, is used only for Veritas Cluster Volume Manager 3.5. SGeRAC also supports multi-node packages.

As of SGeRAC version A.11.17, only two multi-node packages are supported for managing CVM/CFS: the mount point package, SG-CFS-MP-ID#, and the disk group package, SG-CFS-DG-ID#. Both are shipped with Serviceguard.

Like system multi-node packages, multi-node packages do not fail over, and can run on more than one node at a time. Unlike system multi-node packages, they do not have to run on every active node in the cluster, but can be configured to run on specific nodes.

Multi-node packages function for CFS in much the same way as the STORAGE_GROUP parameter functions for CVM 3.5. They allow an application package to build a dependency on another package, such as a dependency on a cluster file system package or disk group package.

CFS packages use a new parameter set, added to the package configuration file, that you can use to create dependencies. This parameter ensures that a package will not start on a node unless the package it depends on is up and running on that node.

For more information on Serviceguard and CFS see the *Serviceguard Version A.11.18 Release Notes* at **http://docs.hp.com** -> High Availability -> Serviceguard -> Release Notes.

**NOTE**          When using either HP Serviceguard CFS 4.1 (T2777BA) and 5.0 (T2777CA) for RAC or HP Serviceguard CFS 4.1 (T2797BA) and 5.0 (T2797CA) for RAC with MCOE, single instance Oracle is not supported if instance startup and shutdown is outside of Serviceguard package control.

### About Veritas CFS and CVM

Veritas CFS and CVM are supported on some, but not all current releases of HP-UX. Check the latest Release Notes for your version of Serviceguard for up-to-date information at **http://docs.hp.com** -> High Availability -> Serviceguard.

For more information on support, compatibility and features for SGeRAC, refer to the *Serviceguard and Serviceguard Extension for RAC Compatibility and Feature Matrix*, located at **http://docs.hp.com** -> High Availability -> Serviceguard Extension for RAC.

## Support for Oracle 9i RAC on CFS and CVM

SGeRAC supports Oracle 9i RAC on CFS 4.1 (or later) and CVM 4.1 (or later) through Serviceguard A.11.18 on HP-UX 11i v2 with the following product numbers:

- HP Serviceguard CFS 4.1 (T2777BA) and 5.0 (T2777CA) for RAC

- HP Serviceguard CFS 4.1 (T2797BA) and 5.0 (T2797CA) for RAC with MCOE.

Also, SGeRAC supports Oracle 9i RAC on CVM version 3.5. (For more detail information on CFS and CVM, refer to the *Managing Serviceguard Fourteenth Edition* user's guide).

## Support for Oracle 10g RAC on CFS and CVM

SGeRAC supports Oracle 10g RAC on CFS 4.1 (or later) and CVM 4.1 (or later) through Serviceguard A.11.18 on HP-UX 11i v2 with the following product numbers:

- HP Serviceguard CFS 4.1 (T2777BA) and 5.0 (T2777CA) for RAC

- HP Serviceguard CFS 4.1 (T2797BA) and 5.0 (T2797CA) for RAC with MCOE.

Also, SGeRAC supports Oracle 10g RAC on CVM version 3.5. (For more detail information on CFS and CVM, refer to the *Managing Serviceguard Fourteenth Edition* user's guide).

## Support for the SGeRAC Toolkit

The SGeRAC Toolkit provides documentation and scripts to simplify the integration of SGeRAC and the Oracle 10g RAC stack. It also manages the dependency between Oracle Clusterware and Oracle RAC instances with a full range of storage management options supported in the Serviceguard and SGeRAC environment.

The framework provided by the SGeRAC toolkit is unique in the high level of multi-vendor (Oracle, Symantec, HP) and multi-storage platform (CFS, SLVM, CVM, ASM over SLVM) integration it offers.

SGeRAC toolkit uses the multi-node package and simple package dependency features integrated with HP Serviceguard and SGeRAC version A.11.18, which provides a uniform, easy-to-manage and intuitive method to coordinate the operations of the SGeRAC and Oracle Clusterware combined software stack. The toolkit is supported across the full range of storage management options supported by SGeRAC: CFS, SLVM, CVM and ASM (over SLVM).

For software download and product information, refer to the following:

- *Use of Serviceguard Extension for RAC Toolkit with Oracle 10g RAC* white paper located at **http://docs.hp.com** -> High Availability -> Serviceguard Extension for Real Application Clusters -> White Papers.

- README file that accompanies the SGeRAC Toolkit. To view go to `/opt/cmcluster/SGeRAC/toolkit/README` after the installation.

- For software download information on the SGeRAC Toolkit, go to **http://software.hp.com**.

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**NOTE**    *Modular* packages are not yet supported in the SGeRAC Toolkit.

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## Support for 8192 Oracle Server Processes for Oracle 9i RAC

The maximum number of Oracle server processes `cmgmsd` can handle is 8192. When there are more than 8192 server processes connected to `cmgmsd`, it will start to reject new requests. Oracle foreground server processes are needed to handle the requests of the Data Base (DB) client connected to the DB instance.

## Serviceguard Extension for RAC does not support Mixed Clusters

For SGeRAC, the nodes in the cluster must be on the same architecture. SGeRAC does not support clusters containing mixed architectural nodes, which consist of HP 9000 and HP Integrity servers, or different operating system releases.

## About Device Special Files (DSFs)

HP-UX releases up to and including 11i v2 use a naming convention for device files that encodes their hardware path. For example, a device file named `/dev/dsk/c3t15d0` would indicate SCSI controller instance 3, SCSI target 15, and SCSI LUN 0. HP-UX 11i v3 introduces a new nomenclature for device files, known as agile addressing (sometimes also called persistent LUN binding). Under the agile addressing convention, the hardware path name is no longer encoded in a storage device's name; instead, each device file name reflects a unique instance number, for example `/dev/[r]disk/disk3`, that does not need to change when the hardware path does.

Agile addressing is the default on new 11i v3 installations, but the I/O subsystem still recognizes pre-11i v3 device files, which as of 11i v3 are referred to as legacy device files. Device files using the new nomenclature are called persistent device files, When you upgrade to HP-UX 11i v3, a set of new, persistent device files is created, but the existing, legacy device files are left intact and by default will continue to be used by HP-UX and Serviceguard.

This means that you are not required to migrate to agile addressing when you upgrade to 11i v3, though you should seriously consider its advantages (see the white paper *The Next Generation Mass Storage Stack under Network and Systems Management* -> Storage Area Management at docs.hp.com).

Migration involves modifying system and application configuration files and scripts to use persistent device files and in some cases new commands and options; the process is described in the white papers *Migrating from HP-UX 11i v2 to HP-UX 11i v3* and *LVM Migration from Legacy to Agile Naming Model HP-UX 11i v3* at **http://docs.hp.com**.

If you cold-install HP-UX 11i v3, sets of both legacy and persistent device files are automatically created. In this case, by default the installation process will configure system devices such as the boot, root, swap, and dump devices to use persistent device files. This means that system configuration files such as /etc/fstab and /etc/lvmtab will contain references to persistent device files, but Serviceguard's functioning will not be affected by this.

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| **NOTE** | It is possible, though not a best practice, to use legacy DSFs on some nodes after migrating to agile addressing on others; this allows you to migrate different nodes at different times, if necessary. |

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| **CAUTION** | You cannot migrate to the agile addressing scheme during a rolling upgrade if you are using cluster lock disks as a tie-breaker, because that involves changing the cluster configuration. But under certain conditions, you can migrate the cluster lock device file names to the new scheme without bringing the cluster down. For the requirements and a procedure, see the section "Updating the Cluster Lock Configuration" in chapter 7 of the *Managing Serviceguard Fourteenth Edition* user's guide. |

For more information about agile addressing, see following documents at **http://docs.hp.com**:

- the *Logical Volume Management volume of the HP-UX System Administrator's Guide* (in the 11i v3 -> System Administration collection)

- the *HP-UX 11i v3 Installation and Update Guide* (in the 11i v3 -> Installing and Updating collection)

- the following white papers:

  — *The Next Generation Mass Storage Stack* (under Network and Systems Management -> Storage Area Management)

  — *Migrating from HP-UX 11i v2 to HP-UX 11i v3*

  — *HP-UX 11i v3 Native Multi-Pathing for Mass Storage*

  — *LVM Migration from Legacy to Agile Naming Model HP-UX 11i v3*

See also the HP-UX 11i v3 intro(7) manpage.

## What Manuals are Available for This Version

The following manuals are shipped with version A.11.18 of SGeRAC:

- *Using Serviceguard Extension for RAC,* (T1907-90048). This manual has been developed for the A.11.18 release. It describes the RAC-specific extensions to Serviceguard that are used in configuring RAC clusters (formerly known as OPS clusters).

You should also refer to the following documents when using SGeRAC:

- *Managing Serviceguard Fourteenth Edition,* (B3936-90117). This manual was revised for the A.11.18 release and describes all basic cluster configuration and administration tasks.

- *Serviceguard Version A.11.18 Release Notes,* (B3935-90108). These release notes describe the basic cluster functionality available in the A.11.18 release.

- *Enterprise Cluster Master Toolkit Version B.04.00 Release Notes,* (T1909-90049**)**. These release notes describe a set of templates and scripts that allows you to configure Serviceguard packages for the Internet servers as well as for third-party database management systems.

- *HP Serviceguard Storage Management Suite Version A.01.01 Release Notes,* (T2771-90030). These release notes describe suite bundles for the integration of HP Serviceguard A.11.18 with Symantec's VERITAS Storage Management 4.1.

- *HP Serviceguard Storage Management Suite Version A.02.00 Release Notes*, (T2771-90036). These release notes describe suite bundles for the integration of HP Serviceguard A.11.18 with Symantec's VERITAS Storage Management 5.0.

- *VERITAS Storage Foundation for Oracle RAC. HP Serviceguard Storage Management Suite Configuration Guide Extracts*. This guide provides the HP related information extracted from VERITAS partner documentation and supplemented with HP specific content.

- *VERITAS Storage Foundation for Oracle RAC. HP Serviceguard Storage Management Suite Administration Guide Extracts*. This guide provides the HP related information extracted from VERITAS partner documentation and supplemented with HP specific content.

Other relevant information for HP-UX systems is found in:

- *Managing Systems and Workgroups,* (5990-8172)
- *Managing Serviceguard NFS,* (B5140-90017)

For information about online replacement of PCI LAN cards, refer to

- *Configuring HP-UX for Peripherals,* (B2355-90698)

For information about the Event Monitoring Service, refer to:

- *Using the Event Monitoring Service,* (B7612-90015)
- *Using High Availability Monitors*, (B5736-90046)
- *Writing Monitors for the Event Monitoring Service,* (B7611-90016)

For information about the SGeRAC Toolkit, refer to:

- *Use of Serviceguard Extension for RAC Toolkit with Oracle 10g RAC* white paper

The above documents are available on the HP-UX documentation web site at the following URL:

**http://docs.hp.com/hpux/11iv2** or **11iv3**

More up to date versions may be available on **http://docs.hp.com** -> High Availability. In addition, review the README file that accompanies the toolkit you are using.

## Further Reading

Additional information about Serviceguard Extension for RAC and related high availability topics may be found on Hewlett-Packard's HA documentation web page:

**http://docs.hp.com** -> High Availability

Support information, including current information on patches and known problems, is available from Hewlett-Packard IT center:

**http://itrc.hp.com** -> "subscribe to security bulletins and patch digests" -> High Availability program tips and issues (Americas and Asia Pacific)

**http://europe.itrc.hp.com** -> "subscribe to security bulletins and patch digests" -> High Availability program tips and issues (Europe)

To receive the latest news about recommended patches, product support matrices, and recently supported hardware, go to the IT Resource Center site above, and subscribe to the high availability programs tips and issues digest.

For more information on support, compatibility and features for SGeRAC, refer to the *Serviceguard Compatibility and Feature Matrix*, located at **http://docs.hp.com** -> High Availability -> Serviceguard Extension for Real Application Clusters -> Support Matrixes.

# Compatibility Information and Installation Requirements

Read this entire document and any other Release Notes or READMEs you may have before you begin an installation.

## Types of Releases and Patches

Versions of Serviceguard Extension for RAC are provided as platform releases, feature releases, or patches.

### Platform Release

A platform release is a stable version of the product, which is the preferred environment for the majority of customers. Platform releases may also contain new features. These releases are supported for an extended period of time, determined by HP. Patches will be made available within the extended support time frame even though a newer version of the product is available.

### Feature Release

A feature release contains new product features. Feature releases are for customers who desire to use the latest features of the product. In general, feature releases will be supported until a newer version becomes available. In order to receive fixes for any defects found in a feature release after a newer version is released, the customer will need to upgrade to the newer, supported version.

### Patch

A patch to a release is issued in response to a critical business problem found by a customer. With a patch, the following is guaranteed:

- Patch-specific release testing is performed prior to posting the patch.

- Existing functionality, scripts, etc...., will continue to operate without modification.

- All fixes from the previous patch are incorporated.

For a patch, certification testing is recommended only for those fixes that are important to the customer.

## Serviceguard Extension for RAC Compatibility with HP-UX and Oracle Releases

The following table explains which HP-UX and Oracle releases should be used with the supported versions of SGeRAC. Only releases labeled *Platform Release* or *Current Version* will be patched as required. Platform releases will be supported within the specified time frame. Users of versions that are not current are encouraged to move to a current version of Serviceguard on the corresponding HP-UX release.

**Table 1-1**  **Compatibility of Serviceguard Extension for RAC with HP-UX and Oracle Releases**

| SGeRAC Versions | Support Status | Main Features of the Release | Compatible HP-UX and Serviceguard Releases | Compatible RAC Releases | *User's Guide* Part Number |
|---|---|---|---|---|---|
| A.11.18 | Platform Release | Shared LVM Online Volume Reconfiguration, Shared LVM Online Node Addition and Deletion. Support for Oracle 9i RAC on CFS 4.1 (or later) and CVM 4.1 (or later), Support for Oracle 10g RAC on CFS 4.1 (or later) and CVM 4.1 (or later). | 11i v2 and 11i v3 with Serviceguard A.11.18 on both HP 9000 and/or HP Integrity servers | RAC 9.2.0 RAC 10.2.0 | T1859-90048 |

## Port Requirements

SGeRAC has no additional port requirements. (Refer to the *Serviceguard Version A.11.18 Release Notes* for port and specific application requirements).

## Installing Serviceguard Extension for RAC

To install Serviceguard Extension for RAC independently, follow these steps:

1. Install or upgrade to HP-UX 11i v2 or 11i v3 before loading Serviceguard Extension for RAC Version A.11.18.

2. Use the `swinstall` command to install SGeRAC, product number T1907BA.

3. Verify the installation. Use the following command to display a list of all installed components:

   **`# swlist -R T1907BA`**

   Serviceguard version A.11.18 will automatically be installed as part of the bundle installation process.

Serviceguard Extension for RAC will automatically be installed when you install one of the following HP Serviceguard Storage Management Suite bundles:

- With either HP Serviceguard Cluster File System for RAC version 4.1, (T2777BA) or HP Serviceguard Cluster File System version 4.1 for RAC with MCOE, (T2797BA).

  For more information on either HP Serviceguard Cluster File System version 4.1 for RAC (T2777BA) or HP Serviceguard Cluster File System for RAC with MCOE (T2797BA), see the *HP Serviceguard Storage Management Suite Version A.01.01 Release Notes* (T2771-90030).

- With either HP Serviceguard Cluster File System for RAC version 5.0, (T2777CA) or HP Serviceguard Cluster File System version 5.0 for RAC with MCOE, (T2797CA).

For more information on either HP Serviceguard Cluster File System version 5.0 for RAC (T2777CA) or HP Serviceguard Cluster File System for RAC with MCOE (T2797CA), see the *HP Serviceguard Storage Management Suite Version A.02.00 Release Notes* (T2771-90036).

After installation, for example, use the following commands to display a list of all installed components:

**# swlist -R T1905BA**

**# swlist -R T1907BA**

**NOTE**    If you are adding Serviceguard Extension for RAC to an existing cluster that is already configured with Serviceguard, there are additional steps. See section "Adding Serviceguard Extension for RAC to an Existing Cluster".

For more information about installation procedures and related issues, refer to the following manuals:

- *Managing HP-UX Software with SD-UX*, (B2355-90154)
- *swinstall* (1M) in the *HP-UX Reference,* (B2355-60105)

## Adding Serviceguard Extension for RAC to an Existing Cluster

If you have already installed Serviceguard and are running a Serviceguard cluster, use the following steps to add SGeRAC:

**NOTE**    All nodes in the cluster must be either all SGeRAC nodes or Serviceguard nodes. SGeRAC cluster must have SGeRAC software installed on all nodes.

1. Halt the cluster.
2. Use swinstall to install SGeRAC on each node.

3. Modify the cluster configuration ASCII file as necessary for RAC use, add `OPS_VOLUME_GROUP` if required, then run the `cmapplyconf` command.

4. Reboot each node.

5. Restart the cluster.

### Removing SGeRAC

To remove your software, run the SD-UX `swremove` command.

If you are removing SGeRAC and wish to continue using the cluster as an Serviceguard cluster, there are slightly different steps. See section "Removing Serviceguard Extension for RAC Without Removing Serviceguard".

Use the following steps to remove the software from each node:

***Online Node Reconfiguration:***

1. Halt the cluster services on the node(s) to be removed. Edit the cluster ASCII file to remove the nodes from which you removed SGeRAC, then re-apply the configuration. The cluster remains up and running.

2. Issue the `swremove` command to remove the software.

***Offline Node Reconfiguration:***

1. Halt the cluster and remove the node from the configuration. If you intend to continue running the SGeRAC cluster on the remaining nodes, edit the cluster ASCII file to remove the nodes from which you removed SGeRAC, then re-apply the configuration.

2. Optionally, restart the cluster on the remaining nodes.

3. Issue the `swremove` command to remove the software. If SGeRAC is being deinstalled from more than one system, it should be removed from one system at a time.

Optionally, after de-installing SGeRAC, you may use the `swremove` command to de-install Serviceguard.

### Removing Serviceguard Extension for RAC Without Removing Serviceguard

If you want to remove SGeRAC and return the cluster to use as a Serviceguard cluster, use the following steps:

1. Halt the cluster.

2. Use `swremove` to remove SGeRAC from each node.

3. Reboot each node.

4. Edit the cluster configuration ASCII file to remove any
   `OPS_VOLUME_GROUP` entries, then run the `cmapplyconf` command.

5. Restart the cluster.

## Troubleshooting Tips

The core dump locations for the cluster manager and shared logical
volume manager daemons are in `/var/adm/cmcluster` and
`/etc/lvmconf` respectively. For `cmgmsd`, the core dump location is in
`/var/adm/cmcluster/cmsgmsd`. By default, log messages from these
daemons appear in `/var/adm/syslog/syslog.log`.

# Patches and Fixes in this Version

This section describes patches that are required and defects that have been fixed in version A.11.18 of SGeRAC.

## Required and Recommended Patches

The following are patches required or recommended for use with SGeRAC version A.11.18 on HP-UX 11i v2. This list is subject to change without notice. Contact your HP support representative for up-to-the-moment information.

To receive the latest news on recommended patches, product support matrices, and recently supported hardware, subscribe to the *High Availability program tips and issues digest* on the ITRC.

**NOTE**    Patches can be superseded or withdrawn at any time. Be sure to check the status of any patch before downloading it.

### Shared LVM Online Reconfiguration (SNOR) Patches

Table 1-2 list patches that are required to support the Shared LVM Online Reconfiguration (SNOR) feature on HP-UX 11i v2.

**Table 1-2**        **HP-UX 11i v2 Patches for SNOR**

| Patch | Post Date | Description |
|-------|-----------|-------------|
| PHCO_33309 | 20050927 | s700_800 11.23 LVM Commands Patch |
| PHKL_33312 | 20050927 | s700_800 11.23 LVM Cumulative Patch |

## Oracle Patches

### Cluster Interconnect Subnet Monitoring

The Cluster Interconnect on Subnet Monitoring feature requires Oracle patch set 10.2.0.3.

| NOTE | For specific *Oracle* patch installation requirements and procedures please contact *Oracle*. |
|------|-----------------------------------------------------------------------------------------------|

## Fixes

The following defects have been fixed in SGeRAC version A.11.18. This list is subject to change without notice. For the most current information contact your HP support representative.

| Defect Number | Problem and Resolution |
|---------------|------------------------|
| SR: 8606443147 (JAGag00852) | *Problem:* Improve error handling while validating clients in cmgmsd. In certain rare cases, cmgmsd may not be able to query the attributes of the sockets opened by its client processes. In such cases, cmgmsd may hang and will eventually be killed by cmcld. |
| | *Resolution:* Fix is available in patch PHSS_34824. |

| Defect Number | Problem and Resolution |
|---------------|------------------------|
| SR: 8606462012 (JAGag17936) | *Problem:* error register to group -- port does not belong to pid. cmgmsd failed to call pstat_getsocket to retrieve socket information due to less memory. |
| | *Resolution:* Fix is available in patch PHSS_34824. |

| Defect Number | Problem and Resolution |
|---------------|------------------------|
| SR: 8606472718 (JAGag27561) | *Problem:* remove the well known ports. cmgmsd uses internet socket and port number 5308 & 5408 for the communication between cmgmsd and cmgmsd client. Do not use ports 5308 and 5408 since they are already registered by other companies. |
| | *Resolution:* Fix is available in patch PHSS_34824. |

| Defect Number | Problem and Resolution |
|---------------|------------------------|
| SR:8606439160 (JAGaf97163) | *Problem:* crsctl stop crs caused many SIGKILL messages in cmgmsd.log |

*Resolution:* After sending the kill signal to the client, cmgmsd waits for a short period of time before sending another kill signal. This allows the client more time to process the signal and exit before another kill signal is sent.

For SGeRAC Version A.11.17 requires patch PHSS_33838.

| Defect Number | Problem and Resolution |
|---|---|
| SR:8606435963 (JAGaf94337) | *Problem:* cmgmsd killed itself and brought node down. |

*Resolution:* Changed the source code not to process the group member if the de-registration of this group member is successful.

For SGeRAC Version A.11.17 requires patch PHSS_33838.

| Defect Number | Problem and Resolution |
|---|---|
| SR:8606427015 (JAGaf86496) | *Problem:* skgxnqgrp does not return correctly. |

*Resolution:* Changed the source code to return an empty bitmap if the specified group is not found.

For SGeRAC Version A.11.17 requires patch PHSS_33838.

| Defect Number | Problem and Resolution |
|---|---|
| SR:8606453198 (JAGag09971) | *Problem:* errors when /etc/cmcluster's file system becomes full (SGeRAC installations only). When the file system where /etc/cmcluster resides became full when Serviceguard Extension for RAC was running, and Oracle software was trying to request a group membership change, messages such as the following appeared in syslog: |

```
cmgmsd[1997]: Unable to apply the configuration
change due to insufficient disk space.
cmgmsd[1997]:
```

```
ERROR: commit_cdb_txn: Failed to commit
transaction (28, No space left on device) This
could ultimately lead to various Oracle
failures.
```

*Resolution:* cmgmsd transactions no longer fail if there is not enough disk space to write them to the binary configuration file. An error is written to syslog but the transaction completes, preventing Oracle errors. The transaction is written to disk on nodes which have enough space.

SGeRAC Version A.11.17 requires Serviceguard patch PHSS_35371.

# Known Problems and Workarounds

The following describes known problems for SGeRAC version A.11.18 and workarounds for them. However, this is subject to change without notice. For the most current information contact your HP support representative.

More recent information on known problems and workarounds may be available on the Hewlett Packard IT Resource Center:

**http://itrc.hp.com** (Americas and Asia Pacific)

**http://europe.itrc.hp.com** (Europe)

## JAGag33099 (SR860678856): In a cluster of more than 3 nodes, node failed to join

*What is the problem?* In a cluster with more than 3 nodes, if 2 or more nodes restart at the same time after certain failures and then try to automatically join the cluster (through system startup), then one of the nodes can fail to join the cluster. The cmrunnode command run by the system startup script will time out. The syslog file on that node will contain messages such as:

```
Feb 24 17:30:58 sienna syslog: /usr/sbin/cmrunnode -v ....

....
Feb 24 17:40:19 sienna cmcld[2729]: Cluster formation failed
Feb 24 17:40:19 sienna cmcld[2729]: Reason: Ran out of time for
automatically joining a cluster
```

In addition, one of the existing nodes in the cluster will have a message such as this in syslog :

```
Feb 24 17:31:04  milan cmcld[2729]: Detected different
configuration data on node sienna
Feb 24 17:31:04  milan cmcld[2729]: Can not form cluster with
node sienna
```

*What is the workaround*? Run cmrunnode from the command line on the node which has failed to join the cluster.

# Software Availability in Native Languages

SGeRAC version A.11.18 does not provide native language support. However, separate native language versions of documentation are available with the following options:

- AB0: Traditional Chinese
- AB1: Korean
- AB2: Simplified Chinese
- ABA: English
- ABJ: Japanese