



Hewlett Packard
Enterprise

HPE Serviceguard for Linux 12.20.00

Release Notes

Abstract

This document provides information about new features, defects fixed, and known problems and limitations for HPE Serviceguard 12.20.00 version.

Part Number: P04487-001
Published: December 2017

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HPE Serviceguard for Linux Base edition updates

Features supported in this version

Serviceguard A.12.20.00 supports the following features:

- Serviceguard Root Disk Monitoring feature provides protection against failure of root disks. When a root disk of a node fails, Serviceguard detects the failure and sends a message about the failure to all member nodes in the cluster. Serviceguard then resets the node associated with the faulty root disk. After the node is reset, all the monitored applications and workloads running on that node fail over to another healthy node.
- Hyper-V based Virtual machines as cluster nodes.

Features supported in earlier versions

Features supported in A.12.10.00

- Serviceguard for Linux 12.10.00 is configurable with any SCSI-3 Persistent Reservation compliant storage array for High Availability(HA) protection of any workload or application. For more information see, *HPE Serviceguard for Linux Certification Matrix* available at <http://www.hpe.com/info/linux-serviceguard-docs>.
- You can use the Toolkit Studio for easy, quick, and efficient integration of any application with Serviceguard for Linux cluster. Toolkit Studio is available for custom toolkit development. Toolkit Studio provides a Graphical User Interface for creation and deployment of application toolkit for its integration with Serviceguard for Linux cluster.
- To verify and generate reports for cluster and package configuration, Serviceguard for Linux has intuitive Graphical User Interface which allows flexible selection of various cluster objects for its verification operation. It also has the ability to save and retrieve reports for later reviews based on your preference.
- In addition to Command Line Interface (CLI) and Serviceguard Manager (Graphical User Interface), you can use the RESTful Application Programming Interface (API) to program your infrastructure to configure, monitor, and manage Serviceguard clusters, packages, and workloads.

Features supported in A.12.00.51

- Serviceguard A.12.00.51 supports the cluster configuration for Virtual Machines deployed on VMware ESXi hosts enabled with Distributed Resource Scheduler(DRS). The DRS manages the allocation of physical resources to a set of virtual machines deployed in a cluster of hosts, each running VMware's ESXi hypervisor.
- Serviceguard supports Application Tuner Express (ATX).

Features supported in A.12.00.50

Serviceguard Manager B.12.00.50 introduces a new capability to perform seamless vMotion of Serviceguard cluster nodes VMs with a single click. This feature simplifies the migration of cluster nodes VMs.

Serviceguard Manager has been enhanced to configure the subnets automatically during Serviceguard Manager installation. Prior to the B.12.00.50 Serviceguard Manager release, the user needed to perform a manual step to configure the settings to use Serviceguard Manager.

Features supported in A.12.00.40

VMware Virtual Machine File System (VMFS)—Serviceguard for Linux 12.00.40 introduces support for VMFS (Virtual Machine File System) as a supported storage configuration in Serviceguard Packages. This enhancement allows seamless integration with other VMware features as follows:

- vMotion of VMware virtual machines configured as Serviceguard nodes.
- Native Multipathing (NMP) to shared storage from VMware hosts.

For more information on VMFS feature, see *Managing HPE Serviceguard for Linux A.12.00.40*.

Features supported in A.12.00.30

Serviceguard A.12.00.30 contains the following features:

- Support for Smart Quorum
For more information on Smart Quorum, see *Managing HP Serviceguard A.12.00.30 for Linux*.
- Support for Red Hat Enterprise Linux (RHEL) 7 and SUSE Linux Enterprise Server (SLES)12.

NOTE:

For RHEL 5, 6, and SLES 11, Serviceguard for Linux A.12.00.30 is available as a patch.

Features supported in A.12.00.22

There are no new features in this version of the release. The patch contains only defect fixes for the following component:

SGeSAP

NOTE:

For 12.00.22 version, only Advanced and Enterprise edition were released.

Features supported in A.12.00.21

There are no new features in this version of the release.

Features supported in A.12.00.20

Serviceguard for Linux A.12.00.20 supports these new features:

Serviceguard Analytics for Linux A.12.00.20 supports shared storage option to consolidate all the events of Serviceguard cluster in a common location. After the installation of Serviceguard Analytics for Linux A.

12.00.20, it is recommended to configure shared storage to store all cluster events so that cluster analytics daemon can access analytics database from all nodes in the cluster. For information on configuring shared storage, see *Managing HPE Serviceguard A.12.00.20 for Linux* available at <http://www.hpe.com/info/linux-serviceguard-docs>.

Serviceguard for Linux A.12.00.20 also supports the following enhancements from Serviceguard Manager:

- User can perform cluster, node and package operations using Serviceguard manager. These operations status display is enhanced for all operation with detailed description of errors.
- You can view and upgrade Serviceguard cluster licenses from Serviceguard Manager.

For more information about these new features, see the latest *Serviceguard Manager Online Help*.

Features supported in A.12.00.00

Serviceguard for Linux A.12.00.00 supports these new features

- **Cluster simulation**

Cluster simulation allows administrators to simulate different kinds of failures, such as node, network, and workload failures (that is, Serviceguard packages). Cluster simulation is capable of simulating node and network interface failures. Cluster simulation evaluates and analyzes what happens to the package due to simulated failures, whether the packages will failover and start on a specified node. The cluster states reported by the simulated cluster exactly matches with the real Serviceguard cluster. This helps in analyzing high availability design for various failure scenarios.

`cmsimulatecl` command is introduced as part of this feature. This command allows users to simulate Serviceguard cluster environment to verify high availability design and identify SPOF (single points of failures) in the Serviceguard cluster deployment. For more information about cluster simulation see *Managing HPE Serviceguard A.12.00.00 for Linux* manual available at <http://www.hpe.com/info/linux-serviceguard-docs>.

- **Load sensitive package placement**

Serviceguard load sensitive placement for packages enables packages to be placed in such a way that package weights are distributed evenly among the cluster nodes based on each node's capacity. This ensures even distribution of workloads across cluster nodes during failover. For more information about load balancing see *Managing HPE Serviceguard A.12.00.00 for Linux* manual available at <http://www.hpe.com/info/linux-serviceguard-docs>.

- **Veritas Volume Manager (VxVM)**

Serviceguard supports the use of Veritas Volume Manager (VxVM) and Veritas File System (VxFS) to meet the data management needs of applications configured in packages. VxVM is a storage management solution that allows you to manage physical and logical devices. VxFS is yet another constituent of Veritas Storage Foundation product suite which provides the file system management functionality. For more information on VxVM and VxFS, see *Managing HPE Serviceguard A.12.00.00 for Linux*. For information on configuring VxVM Diskgroups for Serviceguard Extended Distance Cluster product see *HPE Serviceguard Extended Distance Cluster for Linux A.12.00.00 Deployment Guide* available at <http://www.hpe.com/info/linux-serviceguard-docs>.

- **btrfs file system**

Serviceguard supports the use of `btrfs` file systems for application with the packages managed in the cluster. `btrfs` is a new copy on write (CoW) file system for Linux aimed at implementing advanced features while focusing on fault tolerance, repair, and administration. For more information

on `btrfs` file system see Managing HPE Serviceguard A.12.00.00 for Linux manual available at <http://www.hpe.com/info/linux-serviceguard-docs>.

- **Scalable cluster: 32 nodes support**

With this release, the node support in Serviceguard is extended from 16 to 32 nodes, so now the cluster can have upto 32 nodes. For more information see Managing HPE Serviceguard A.12.00.00 for Linux manual available at <http://www.hpe.com/info/linux-serviceguard-docs>.

- **Easy deployment to set up cluster - Create a cluster in three simple steps.**

Serviceguard for Linux A.12.00.00 offers quick and easy configuration of a cluster using just a few commands. Easy deployment is a feature that provides quick and simple way to create a cluster. It automates the security, shared storage, and networking configuration required by the package and cluster, it also simplifies cluster lock configuration using these commands:

- `cmquerycl`—This is an existing command which is enhanced with option `-N` to query available network configuration and generate network template.
- `cmpreparestg`—Using this command you can create or modify LVM, VxVM storage shared between Serviceguard nodes.
- `cmdeploycl`—Using this commands you can deploy the cluster with the previously generated network and storage configuration.

For more information on `cmquerycl`, `cmpreparestg`, and `cmdeploycl` commands see corresponding Manpages.

- **Support for IPV6 address**

You can use both IPv4 or the IPv6 address family for any subnet configured into the cluster, including subnets that carry the cluster heartbeat, and those connected to a Quorum Server. For more information about these modes including restrictions for IPv6-only and mixed modes see Managing HPE Serviceguard A.12.00.00 for Linux manual available at <http://www.hpe.com/info/linux-serviceguard-docs>.

- **New behavior during online reconfiguration of the package**

Serviceguard supports non-disruptive online modification of packages, so the packages will not fail due to any error during online reconfiguration. For more information, see Managing HPE Serviceguard A.12.00.00 for Linux manual available at <http://www.hpe.com/info/linux-serviceguard-docs>

- **License Information**

Serviceguard now requires per-socket license. You can manage the license using the following commands:

- `cmgetlicense`— This command displays the currently installed Serviceguard License information. When you invoke this command with `"-f line"` option, it displays the currently installed Serviceguard License information in machine parsable output format. If more than one type of license keys are present, it displays information about the higher license. If more than one similar type of permanent licenses are present, it displays the count of licenses present.
- `cmsetlicense`— This command renews the Serviceguard license at any time within 90 days or after 90 days of license expiry. You can also run `cmsetlicense` command while the node is up and running.

NOTE:

Ensure that you run the `cmsetlicense` command on each node. When you add a new node to the cluster you must apply the license using the `cmsetlicense` command.

For more information about license see the appropriate release notes as per your bundle (Base, Advanced, and Enterprise) available at <http://www.hpe.com/info/linux-serviceguard-docs>

- **Improved installation and upgrade through `cmeasyinstall` and `cmupgrade` commands**

Serviceguard for Linux A.12.00.00 offers improved installation and upgrade methods through the following commands:

- `cmeasyinstall`—This command helps you to do a fresh installation of HPE Serviceguard and its components such as Serviceguard Extended Distance Cluster, Serviceguard Manager, Oracle toolkit, Enterprise DB toolkit, SAP sybase toolkit and Metroclusters except for SGeSAP from HPE Serviceguard for Linux Base, HPE Serviceguard for Linux Advanced and HPE Serviceguard for Linux Enterprise A.12.00.00 DVD or ISO image.
- `cmupgrade`—This command helps you in upgrading HPE Serviceguard and its components such as Serviceguard Manager, Toolkits, Extended Distance Cluster and Metrocluster except for SGeSAP.

For more information about `cmeasyinstall` and `cmupgrade` commands see the see the appropriate release notes as per your bundle (Base, Advanced, and Enterprise) available at <http://www.hpe.com/info/linux-serviceguard-docs>.

- **Using Serviceguard with virtual machines**

For more information about these new features, see latest *Serviceguard Manager Online Help*. In this configuration, the virtual machine is a member of a Serviceguard cluster, allowing failover of application packages between other physical or VM nodes in the cluster. VMware vMotion feature is supported in this release. For more information about VMware features and configurations see Using HPE Serviceguard for Linux with VMware Virtual Machines white paper at <http://www.hpe.com/info/linux-serviceguard-docs>.

Cluster analytics

Serviceguard cluster analytics provides a mechanism to perform "availability audits" on Serviceguard cluster, node, and application packages running on the cluster. New commands introduced as part of this feature are as follows:

- `cmcaadmin`—This command is used to manage cluster analytics daemon.
- `cmcahowskpi`—This command is used to display KPI (Key Performance Indicator) for Serviceguard cluster, node, and package. New Serviceguard Manager also has capabilities to view KPIs in donut charts and graphs. For more information about cluster analytics see Managing HPE Serviceguard A.12.00.00 for Linux manual available at <http://www.hpe.com/info/linux-serviceguard-docs>.

Features not supported

Serviceguard Manager

- Deletion of VMware hypervisor/vCenter Server credentials from Serviceguard Credential store (SCS) is not allowed from Serviceguard GUI.
- Updating Serviceguard credential store key is not allowed from Serviceguard GUI.
- Simulating a Serviceguard cluster.
- Localization in Simplified Chinese and Japanese.
- Preview option from UI for all supported Serviceguard admin commands.

Compatibility matrix

For information on compatible Serviceguard version, Linux OS versions, and so on, see the latest version of *HPE Serviceguard for Linux Certification Matrix* available at <http://www.hpe.com/info/linux-serviceguard-docs>.

Installation

For more information on installation instructions, see *HPE Serviceguard for Linux Base edition Release Notes* available at <http://www.hpe.com/info/linux-serviceguard-docs>.

Defects fixed

The list of defects fixed in HPE Serviceguard for Linux Base edition 12.20.00 and its relevant details can be found *HPE Serviceguard for Linux Cumulative Update Release changes* guide at https://support.hpe.com/hpsc/doc/public/display?docId=emr_na-a00038449en_us.

Known problems and limitations

This section provides a list of known problems and limitations with HPE Serviceguard for Linux Base edition 12.10.00 as known to HPE at the time of publication. If workarounds are available, they are included.

- QXCR1001610482 — Global switching for halted package is re-enabled unexpectedly. This issue occurs in clusters with package dependency configurations. It typically occurs in SGeSAP scale-up HANA clusters, where a primary and a secondary HANA package have a mutual exclusion dependency that prevents them from running on the same node.

Workaround

Disable the global switching of both mutual exclusion dependency packages before halting the packages.

- QXCR1001605368 — Package fails if out of maintenance mode is reached before service halt timeout. Package fails after being placed out of maintenance mode before service halt timeout number is met if halt on maintenance is yes.
- QXCR1001500925 — During package start time, a warning message `WARNING` in package log `"sg_activate_pr: registration failed on disk"` appears when a Serviceguard package is configured with 3PAR based storage with multipath paths on Linux. You might receive the `reservation conflict` errors in package logs and syslog during package start time.

Workaround

You can ignore these error messages.

- QXCR1001517687 — Serviceguard GUI crashes on Chrome version 54.0.2840.99 m.

Workaround

Use a different version of Chrome or any other supported browser to start Serviceguard GUI.

- QXCR1001490615 — For the listed kernel versions of SLES12 and SLES12 SP1 Serviceguard will not work for IPv6 as heartbeat address

```
SLES 12
-----
3.12.48-52.27.1
3.12.51-52.31.1
```

```
SLES12 SP1
-----
3.12.49-11.1
3.12.51-60.20.2
3.12.51-60.25.1
```

Using IPv6 addresses as heartbeat network will not work in Serviceguard on above mentioned kernel versions. This is due to the issue with `recvfrom()` call which fails to read the UDP packets through IPv6 address.

Workaround

Update the kernel version to latest on SLES12, SLES 12 SP1 systems.

- QXCR1001455844—When multiple VGs based on VMFS type disks are configured in the package, the package may fail back to the node on which it was running. When multiple VGs are configured on VMFS disks, the attach of these disks may take significant time. If the node where package was running had `AUTOSTART_CMCLD` configured as 1, node will join back the cluster and will be eligible to run the package. This will cause volume group tags check on the node where the package is still starting to fail. Package will then move back to the node where it was running earlier.
- QXCR1001424075—The Predictable Network Interface introduced from RHEL 7 has different naming for network interfaces. Due to this, the name length can go up to 16 characters. But, Serviceguard can handle interface names up to 12 characters only.

Workaround

Disable the Predictable Network Interface feature of RHEL 7.

- QXCR1001434349—`systemd` does not honor the ordering dependency on `auth.socket` file during the shutdown. Due to this issue, the cluster node does not shut down properly on RHEL 7.

Workaround

Run `cmhaltnode -f` manually before `systemctl reboot` or `systemctl shutdown` is issued.

Alternatively, configure `authd` to start under `xinetd`. For more information see, <https://access.redhat.com/solutions/3071161>

- QXCR1001435779—Serviceguard Linux patch installation fails due to `xinetd` exit.
On SUSE Linux Enterprise Server, `xinetd` service does not run if no services are configured.

Workarounds

- Restart the `xinetd` service with `-stayalive` option to ensure that the `xinetd` is running even when no services are configured.
- Alternatively, you can also configure any other service before installing the patch to start the `xinetd` service successfully.

For example, you can configure `echo` under `xinetd` using:

```
#!/sbin/chkconfig echo on
```

- QXCR1001378236—If you configure cluster and package together using `cmapplyconf` command and then check for package KPIs (Key Performance Indicators), the KPIs value displayed will be incorrect.
- After installing Serviceguard analytics for Linux A.12.00.20 or later, if `cmproxy` daemon is not running on all nodes in a cluster, then providing high availability for cluster analytics daemon is not possible.
- After installing Serviceguard analytics for Linux A.12.00.20 or later, it is recommended to configure shared storage to store all cluster events so that cluster analytics daemon can access analytics database from all nodes in the cluster. If you do not configure shared storage, cluster analytics will display incorrect value for all KPIs. For more information, see *Cluster Analytics Database Migration to Shared Storage* section from *Managing HPE Serviceguard A.12.00.20 for Linux*.
- Serviceguard analytics for Linux A.12.00.10 or later patch must be installed on all nodes of the cluster if it meets the following criteria:
 - Time zone used on the cluster nodes has DST (Daylight Saving Time).
 - Cluster analytics is installed and configured during the standard time period of 2014.

This ensures that cluster analytics computes the correct values for various KPIs (Key Performance Indicators) during the period of transition from standard to DST or vice versa.

If Serviceguard analytics for Linux A.12.00.10 or later patch is installed after the transition to standard time in 2014 or later, then some of the KPIs computed by cluster analytics might be incorrect. To avoid this problem, cluster analytics database must be initialized prior to the installation of A.12.00.10 or later patch.

The procedure for initializing cluster analytics database is as follows:

1. Stop cluster analytics daemon using `$SGSBIN/cmcaadmin stop` command.
2. Delete the database file located at `$SGCONF/cluster3.db3` prior to installation of A.12.00.10 or later patch.

- QXCR1001251481—RHEL 6.x—Empty XML doc error due to `rpmReadConfigFiles()` failure.

Serviceguard Manager

The known problems and limitations with Serviceguard Manager are as follows:

- QXCR1001433533—Sometimes, Serviceguard Manager fails to load the package monitoring page.
- QXCR1001339661—Nodes are not listed correctly in `Nodes` section.
- Configuration management (**Settings** option in Serviceguard Manager)— While configuring a subnet if certain nodes are not displayed under **Available Subnets**, then ensure that the IP address of all the

Subnets of a node that needs to be configured in Serviceguard Manager is present in `/etc/hosts` file along with host name mapping.

- QXCR1001331670—Serviceguard Manager becomes unresponsive when you perform frequent operations on Serviceguard.
- QXCR1001318457—Sometimes all packages disappears for 20 or 30 seconds.
- QXCR1001376462—Multipath devices are not validated for Lock-LUN use during cluster create or edit operation.

Deprecated or obsolete features

Serviceguard A.12.10.00 and later is not supported on RHEL 5.

Starting with Serviceguard A.12.00.00, legacy packages are obsolete and only modular packages are supported. For more information about how to migrate to modular packages, see the white paper *Migrating packages from legacy to modular style* available at <http://www.hpe.com/info/linux-serviceguard-docs>.

HPE Serviceguard for Linux Advanced edition updates

In addition to features supported with HPE Serviceguard for Linux base edition, the following features are supported with HPE Serviceguard with Linux for Advanced edition.

NOTE:

For details on Serviceguard extension for SAP, see *Serviceguard Extension for SAP Version B.12.10.00 Release Notes for Linux*.

Features supported in this version

Serviceguard A.12.20.00 supports the following features:

- HPE Serviceguard Solutions for Microsoft SQL Server for Linux provides High Availability and Disaster Recovery solutions for Microsoft SQL Server for Linux. With this toolkit, Serviceguard monitors the health of the database and provides high availability and disaster recovery solutions for Failover Instance or Always on Failover Instance (AOFI) deployment models.
- HPE Serviceguard toolkit for IBM Db2 on Linux provides High Availability and Disaster Recovery solutions for Db2 instances with Serviceguard cluster. This toolkit consists of a set of scripts that you can use to start, stop, and monitor Db2 database instance deployed on Linux operating environment.

Features supported in earlier versions

Features supported in A.12.10.00

- For easy viewing of multiple packages and their state which need to be examined together to understand the state of a solution level service delivery, Workload view is now available from single resource pane of Serviceguard Manager. You can create the following workload types:
 - Oracle Single Instance DB
 - Oracle Single Instance DB using ASM

Features supported in A.12.00.51

- Serviceguard A.12.00.51 supports the cluster configuration for Virtual Machines deployed on VMware ESXi hosts enabled with Distributed Resource Scheduler(DRS). The DRS manages the allocation of physical resources to a set of virtual machines deployed in a cluster of hosts, each running VMware's ESXi hypervisor.
- Serviceguard supports Application Tuner Express (ATX).

Features supported in A.12.00.50

- Serviceguard for Linux A.12.00.50 introduces a new model of deployment for Serviceguard in Virtualized KVM environments called "KVM as a Package" model in addition to the existing "KVM as a

Node” model. In the existing “KVM as a Node” model of deployment Serviceguard is deployed in the VMs and the applications are packaged for protection. This toolkit enable users to deploy a Virtual Machine from a KVM hypervisor as a Serviceguard package. With this model of deployment, Serviceguard works at the hypervisor layer to form a cluster of hosts, and to provide availability to the VMs that are deployed as a Serviceguard packages. Serviceguard monitors the virtual machines and restarts the VM on the adoptive hosts during host failures. This ensures that after a failover, the recent image with the latest updated root disk is used. This model of deployment enables better consolidation of standby resources.

This toolkit helps you to do the following:

- A VM carved out of a KVM host is packaged and monitored.
- Using cluster verification feature, you can run the `cmcheckconf -v` command to ensure that the required resources are available on the standby node. This helps in smooth failovers to standby nodes.
- With this release, Serviceguard now supports failover of the container database (CDB) for failure of certain critical pluggable database that are part of the CDB deployed in the package. This feature also allows you to specify the critical PDB whose failure must trigger a failover. This feature is also supported with Serviceguard Manager.

Features supported in A.12.00.40

Support for Oracle 12c Multitenant architecture. For more information, see *HPE Serviceguard Toolkit for Oracle on Linux User Guide*.

Features supported in A.12.00.30

Serviceguard A.12.00.30 contains the following features:

Support for Red Hat Enterprise Linux (RHEL) 7 and SUSE Linux Enterprise Server (SLES)12.

NOTE:

For RHEL 5, 6, and SLES 11, Serviceguard for Linux A.12.00.30 is available as a patch.

- Support for SAP Sybase ASE toolkit package on Red Hat Enterprise Linux (RHEL) 7.x, SUSE Linux Enterprise Server (SLES) 11 SP4, and SLES 12.
- Support for SAP Sybase ASE 16.0.

Features supported in A.12.00.22

There are no new features in this version of the release. The patch contains only defect fixes for SGeSAP.

Features supported in A.12.00.21

There are no new features in this version of the release.

Features supported in A.12.00.20

There are no new features in this version of the release. The patch contains only defect fixes.

Features supported in A.12.00.00

HPE Serviceguard toolkit for Oracle includes support for the following enhancements:

- Oracle toolkit support on RHEL 5.10, RHEL 6.5, and SLES 11 SP3.
- Oracle toolkit maintenance mode is deprecated and instead the Serviceguard maintenance functionality is supported for Oracle toolkit.
- Oracle restart feature support for ASM, Database, listener, and Database service components.

This version of the Serviceguard toolkit for EDB PPAS (EDB PPAS toolkit) includes support for:

Red Hat Enterprise Linux (RHEL) 5.10, 6.5, or 7.x, and SUSE Linux Enterprise Server (SLES) 11 SP3 and SP4.

Feature not supported

The following features are not supported:

- Localization in Simplified Chinese and Japanese.
- The live migration of KVM guests deployed as Serviceguard packages using KVM toolkit is not supported.
- The KVM toolkit does not manage storage pools for application data and OS image.
- Toolkit packages that are not supported with Serviceguard Manager are as follows:
 - Sybase
 - EnterpriseDB Postgres Plus Advanced Server (EDB PPAS)
 - Tomcat
 - Samba
 - MySQL
 - Sendmail
 - PostgreSQL (pgSQL)
 - SAP HANA

Compatibility matrix

For information on compatible Serviceguard version, Linux OS versions, and so on, see the latest version of *HPE Serviceguard Toolkit Compatibility Matrix* available at <http://www.hpe.com/info/linux-serviceguard-docs>.

Installation

With A.12.00.50 release, the KVM toolkit is installed with Advanced bundle.

For information about installing HPE Serviceguard toolkit for Oracle, HPE Serviceguard toolkit for SAP Sybase ASE, SAP Sybase Replication Server, Serviceguard EDB PPAS toolkit, and KVM toolkit, see the

Defects fixed

The list of defects fixed in HPE Serviceguard for Linux Advanced edition 12.20.00 and its relevant details can be found in *HPE Serviceguard for Linux Cumulative Update Release changes* guide at https://support.hpe.com/hpsc/doc/public/display?docId=emr_na-a00038449en_us.

Known problems and limitations

There are no known problems and limitations in HPE Serviceguard toolkit for Oracle, HPE Serviceguard toolkit for SAP Sybase ASE, SAP Sybase Replication Server, Serviceguard EDB PPAS toolkit, and KVM toolkit.

The known problems and limitations with HPE Serviceguard are as follows:

- QXCR1001553897 — After you edit a package, the workload name changes to an auto-generated name.
- QXCR1001530532 — Oracle package takes longer than usual to start and stop in RedHat systems.

Deprecated or obsolete features

Serviceguard A.12.10.00 and later is not supported on RHEL 5.

The A.12.00.00 release, supports the use of Serviceguard package maintenance mode with EDB PPAS toolkit. The HPE Serviceguard toolkit for Oracle and EDB PPAS maintenance mode is now deprecated.

HPE Serviceguard for Linux Enterprise edition updates

In addition to features supported with HPE Serviceguard for Linux Base and Advanced editions, the following features are supported with HPE Serviceguard with Linux for Enterprise edition.

Features supported in this version

Serviceguard A.12.20.00 supports the following features:

- Serviceguard provides a robust monitoring system to monitor all disks of a ASM mirrored disk group configured in a Serviceguard package. Serviceguard discovers all the underlying disks of the ASM mirrored disk group and starts monitoring the disks to check their health. If a disk fails in a disk group, Serviceguard notifies the failure to the end user in the form of alerts and notifications. When the failed disk is restored, Serviceguard makes it available to the disk group.
- HPE Serviceguard Solutions for Microsoft SQL Server for Linux provides High Availability and Disaster Recovery solutions for Microsoft SQL Server for Linux. With this toolkit, Serviceguard monitors the health of the database and provides high availability and disaster recovery solutions for Availability Groups or Always on Availability Groups (AOAG) deployment model.

Features supported in earlier versions

Features supported in A.12.10.00

Serviceguard A.12.10.00 supports the following features:

- To validate and test the preparedness of disaster recovery site without disrupting the operations of production site, Serviceguard for Linux allows the selection of production workloads at site, node, and package levels for their recovery tests conducted at recovery site. It also prepares a detail report which captures the details of various preparedness tests conducted for audit or compliance purposes.
- Serviceguard for Linux configured cluster nodes in VMware ESXi environment are compatible with VMware Site Recovery Manager (SRM) supported recovery plan executions. With this integration, it facilitates automated disaster recovery with continued HA protection for applications independent of their SRM site of operation.
- VMware's Virtual Machine File System (VMFS) based virtual disks can be configured for Serviceguard Metrocluster with EMC SRDF for Linux based Metrocluster for disaster recovery.
- For easy viewing of multiple packages and their state which need to be examined together to understand the state of a solution level service delivery, Workload view is now available from single resource pane of Serviceguard Manager. You can create the following workload types:
 - Oracle Single Instance DB
 - Oracle Single Instance DB using ASM
- Serviceguard Metrocluster with 3PAR Remote Copy for Linux supports SSH based connections only with 3PAR arrays starting from Inform OS 3.3.1 (Supported from Serviceguard A.12.00.51 and later).

Features supported in A.12.00.51

- Serviceguard A.12.00.51 supports the cluster configuration for Virtual Machines deployed on VMware ESXi hosts enabled with Distributed Resource Scheduler(DRS). The DRS manages the allocation of physical resources to a set of virtual machines deployed in a cluster of hosts, each running VMware's ESXi hypervisor.
- Serviceguard supports Application Tuner Express (ATX).
- Metrocluster with 3PAR Remote Copy for Linux supports only SSH connection to the 3PAR arrays from Inform OS 3.3.1 onwards.

Features supported in A.12.00.50

Oracle Data Guard Toolkit for Linux

With Serviceguard 12.00.50 release, a new disaster recovery solution for Oracle workloads based on Oracle dataguard replication is introduced. With this toolkit, Serviceguard manages the Oracle database and Oracle dataguard replication. It performs RPO sensitive automatic role management (failover, switch over) to handle failures, and also supports event notifications.

For more information, see the *HPE Serviceguard Toolkit for Oracle Data Guard on Linux User Guide* available at <http://www.hpe.com/info/linux-serviceguard-docs>.

Metrocluster with 3PAR Remote Copy for Linux

Support for physical servers with disaster recovery solution based on 3PAR peer persistence.

Metrocluster with EMC SRDF for Linux

Metrocluster with EMC SRDF Symmetrix Remote Data Facility is now supported on the following Linux distributions:

- Red Hat Enterprise Linux (RHEL) 7 server
- SUSE Linux Enterprise Server (SLES) 12

Serviceguard Metrocluster for Linux with EMC SRDF B.01.00.00 is now bundled with *Serviceguard for Linux Enterprise Edition A.12.00.50* as *Serviceguard Metrocluster for Linux with EMC SRDF B.12.00.50*. All the features that were supported with Metrocluster EMC SRDF B.01.00.00 are now available for Metrocluster EMC SRDF B.12.00.50 in addition to the following:

- Support for Red Hat Enterprise Linux (RHEL) 7 server
- Support for SUSE Linux Enterprise Server (SLES) 12

Serviceguard Metrocluster for Linux with EMC SRDF B.01.00.00 is no longer available as a standalone product for Serviceguard for Linux Base and Advanced editions.

Following features that were supported with Metrocluster EMC SRDF B.01.00.00 are now bundled with 12.00.50 release:

- Support for Synchronous and Asynchronous Replication mode

Metrocluster with EMC SRDF for Linux includes support for synchronous replication mode. EMC SRDF software offers synchronous and asynchronous data transfer mode between the storage systems. Synchronous data transfer offer the highest levels of data availability. With synchronous operations, both primary and secondary copies are identical and concurrent at all times. Synchronous replication is appropriate when data currency is critical while recovering a business application. In the

asynchronous mode, host writes are performed only on the primary storage array, and the host write is acknowledged as soon as the data is written on the primary storage array.

- Supported for LVM

The LVM is supported with EMC SRDF disk group for Linux.

For more information on supported versions of the volume managers, see the *Serviceguard Disaster Recovery Products Compatibility and Feature Matrix(EMC SRDF disk group)* available at <http://www.hpe.com/info/linux-serviceguard-docs>.

- Support for Continentalclusters

EMC SRDF replication is supported with Continentalclusters and can be used to achieve push button automated recovery of EMC SRDF replication pairs. For more information, see the *Continentalclusters for Linux Version B.01.00.00 Release Notes* available at <http://www.hpe.com/info/linux-serviceguard-docs>.

- Support for failover policies *site_preferred* and *site_preferred_manual*

For more information on these failover policies *site_preferred* and *site_preferred_manual*, see the *Metrocluster SRDF for Linux B.01.00.00 Guide* available at <http://www.hpe.com/info/linux-serviceguard-docs>.

- Support for persistent reservations
- Support for Device Mapper

Features supported in A.12.00.40

- Extended Distance Cluster (XDC) provides support for XDC based LVM Mirroring (RAID 1).
- Metrocluster with Continuous Access EVA P6000 for Linux provides automated failover of Serviceguard packages on local and remote P6000/EVA series disk arrays.
- Support for VMware Virtual Machine File System (VMFS) on the following Metrocluster products:
 - Metrocluster with 3PAR Remote Copy for Linux
 - Metrocluster with Continuous Access EVA P6000 for Linux
 - Metrocluster with Continuous Access XP P9000 for Linux
 - Extended Distance Cluster (XDC)
- Metrocluster with 3PAR Remote Copy for Linux provides the following features:
 - Support for Recovery Point Object (RPO).
 - Support for Asynchronous Streaming Mode
 - Support for peer persistence environment only if VMware Virtual Machine File System (VMFS) module is configured in the package configuration file. A disaster recovery solution based on 3PAR peer persistence with VMware guest nodes.

Features supported in A.12.00.30

Support for Smart Quorum. For more information on Smart Quorum, see *Managing HPE Serviceguard A.12.00.30 for Linux*.

Support for Asymmetric node configuration in a disaster recovery solution. The following Metrocluster products support asymmetric node configuration for sites:

- Metrocluster with 3PAR Remote Copy for Linux
- Metrocluster with Continuous Access EVA P6000 for Linux
- Metrocluster with Continuous Access XP P9000 for Linux

Features supported in A.12.00.22

There are no new features in this version of the release. The patch contains only defect fixes for SGeSAP.

Features supported in A.12.00.21

There are no new features in this version of the release.

Features supported in A.12.00.20

- Site Aware Disaster Tolerant Architecture (SADTA) — SADTA is a framework, which enables you to easily deploy disaster recovery solutions for complex multi-instance workloads. You can create Serviceguard cluster to deploy complex workloads with SADTA using Serviceguard Manager. You can also use this framework to build disaster recovery solution for SAP HANA scale out workloads.
- Metrocluster with 3PAR Remote Copy for Linux supports Failsafe mode of 3PAR array.

Features supported in A.12.00.00

Common features of Metrocluster products

The following are the common features of Metrocluster products:

- **Serviceguard Manager enablement in disaster recovery configuration**

Starting with HPE Serviceguard Manager B.12.00.00, along with Serviceguard for Linux A.12.00.00, the following Serviceguard Manager operations are supported in a Metrocluster environment:

- Configuring, monitoring, and administration of Metrocluster modular packages.

However, the following is the restriction with Serviceguard Manager in a Metrocluster environment:

The Metrocluster package configuration requires a system administrator to configure data replication, which is not supported by the Serviceguard Manager. This step needs to be performed by the administrator outside of HPE Serviceguard Manager.

- **Support for VMWare virtual machines as Metrocluster nodes**

Metrocluster for Linux includes support for configuring VMWare virtual machines as Metrocluster nodes. All the Serviceguard related restrictions and guidelines for configuring VMWare virtual machines as Serviceguard nodes are also applicable to Metrocluster configurations. In Metrocluster configurations, Raw Device Mapping (RDM) is not supported. You must configure the Fiber channel N-

Port ID Virtualization (NPV) for all the virtual machines. For more information on configuring NPV, see the *Using HPE Serviceguard for Linux with VMWare virtual machines* whitepaper.

- **Support for Cluster Verification**

Metrocluster for Linux supports verification of its packages. By using the `cmcheckconf -v` command, you can generate a report on the sanity of the cluster configuration. This feature requires Serviceguard for Linux A.11.20.20 or later.

- **Support for failover policies `site_preferred` and `site_preferred_manual`**

Metrocluster for Linux supports Serviceguard failover policies `site_preferred` and `site_preferred_manual`. These failover policies are supported for failover packages configured in a Metrocluster with sites defined in the Serviceguard cluster configuration file. For more information on the `site_preferred` and `site_preferred_manual` failover policies, see the following documents available at <http://www.hpe.com/info/linux-serviceguard-docs>

- *Building Disaster Recovery Serviceguard Solutions Using Metrocluster with 3PAR Remote Copy for Linux*
- *Building Disaster Recovery Serviceguard Solutions Using Metrocluster with Continuous Access EVA P6000 for Linux*
- *Building Disaster Recovery Serviceguard Solutions Using Metrocluster with Continuous Access XP P9000 for Linux*

- **Support for persistent reservations**

Metrocluster for Linux supports configuring persistent reservations (PR) in Metrocluster packages to control access to LUNs. For more information on persistent reservation, see the *Managing HPE Serviceguard A.12.00.00 for Linux* available at <http://www.hpe.com/info/linux-serviceguard-docs>.

- **Support for Device Mapper**

Metrocluster for Linux supports configuring Device Mapper for disks used in Metrocluster packages. All the Serviceguard related restrictions and guidelines for supporting DM-Multipath are also applicable to Metrocluster configurations.

- **Support for Data Replication Storage Failover Preview**

The `cmdrprev` command enables you to preview the preparation process for data replication in a Metrocluster environment and also helps you in identifying any potential problems in the data replication environment, which if left undetected, may result in an unsuccessful Metrocluster failover.

Metrocluster with 3PAR Remote Copy for Linux

Metrocluster with 3PAR Remote Copy for Linux enables automatic failover of Serviceguard packages between primary and recovery sites. In addition, Metrocluster with 3PAR Remote Copy for Linux provides the following features:

- **Support for Remote Copy volume group monitor**

In a Metrocluster 3PAR environment, Remote Copy volume group (RCVG) monitor provides the capability to monitor the status of the Remote Copy volume group used in a package. It sends notifications to the user via email, syslog, OPC, or console. The notifications are sent when:

- There is a change in a failure or state of Remote Copy volume group.
- The monitor cannot determine the Remote Copy volume group status.

- **Support for easy deployment**

With Metrocluster 3PAR, Metrocluster supports the package easy deployment feature. This feature is only available from the Serviceguard Manager for Linux version B.12.00.00 or later. It provides a simple way to quickly deploy Metrocluster 3PAR modules in supported toolkit applications.

- **Support for online reconfiguration of the packages**

With Metrocluster 3PAR for Linux, you can modify the Metrocluster 3PAR package attributes values while the package is up and running.

- **Support for 3PAR features**

- **Support for synchronous replication mode**

Metrocluster with 3PAR Remote Copy for Linux includes support for synchronous replication mode. It supports synchronous and asynchronous periodic transfer modes between primary and secondary storage systems. Synchronous data transfers offer the highest levels of data availability where with synchronous operations, both the primary and secondary copies are identical and concurrent at all times while recovering a business application.

- **Support for asynchronous periodic mode**

Configure the 3PAR Remote Copy volume group in asynchronous periodic mode when you want no impact on the response time of application.

In the asynchronous periodic mode, host writes are performed only on the primary storage array and the host write is acknowledged as soon as the data is written into cache on the primary storage array. The primary and backup volumes are resynchronized periodically. This is ideal for deployments stretched across longer distances or narrow bandwidths.

- **Support for fully and thinly provisioned virtual volumes**

Metrocluster with 3PAR Remote Copy for Linux supports 3PAR Fully provisioned Virtual Volumes and Thinly Provisioned Virtual Volumes (TPVVs). For TPVVs, all data and snapshot space is allocated on demand from a Common Provisioning Group (CPG), and for fully provisioned virtual volumes, only the snapshot space is allocated on demand from the CPG.

NOTE:

Common Provisioning Group (CPG) is a user created pool of storage from which Virtual Volumes are allocated.

As the volumes that draw from the CPG require additional storage, the system automatically creates additional logical disks and adds them to the pool until the CPG reaches the user-defined allocation limit that restricts its maximum size.

- **Support for Remote Copy configurations**

The following Remote Copy configurations are supported in a Metrocluster environment:

- Bidirectional configuration
- N-to-1 configuration
- 1-to-N configuration

For more information on each of these Remote Copy configurations, see the *3PAR Remote Copy User Guide* available at <http://www.hpe.com/info/storage/docs>.

NOTE:

Both N-to-1 and 1-to-N configuration can have unidirectional and bidirectional Remote Copy configuration. However, the two arrays that are part of a Metrocluster must have a bidirectional Remote Copy configuration between them.

Synchronous Long Distance and Unidirectional Remote Copy configurations are not supported in a Metrocluster.

- **Support for 3PAR Virtual Domains**

This enables fine grained privileges over system objects such as volumes and hosts. Each domain can be dedicated to a specific application. A subset of the 3PAR storage system users can have varying privileges over the domains. Domains can be useful where a single storage system is used to manage data from several different independent applications.

- Supported volume managers with Metrocluster with 3PAR Remote Copy for Linux

The following volume managers are supported with Metrocluster 3PAR Remote Copy for Linux.

- LVM
- VxVM

For the supported versions of the volume managers, see the *Serviceguard Disaster Recovery Products Compatibility and Feature Matrix (Metrocluster 3PAR Remote Copy)* available at <http://www.hpe.com/info/linux-serviceguard-docs>.

- **Support for HP 3PAR Remote Copy replication in Continentalclusters**

HP 3PAR Remote Copy replication is supported with Continentalclusters B.12.00.00 and Metrocluster with 3PAR Remote Copy for Linux B.12.00.00. For more information, see the *Continentalclusters for Linux Version B.12.00.00 Release Notes* available at <http://www.hpe.com/info/linux-serviceguard-docs>.

Metrocluster with Continuous Access EVA P6000 for Linux

The B.12.00.00 version of Metrocluster with Continuous Access EVA P6000 for Linux supports the following features:

- **Support for Synchronous Replication Mode**

Metrocluster for Linux supports Synchronous write mode with P6000/EVA arrays. In Synchronous write mode, the data at primary and remote array are identical and concurrent at any point of time. This write mode is required when business application needs concurrent data.

- **Support for Enhanced Asynchronous Replication Mode**

Metrocluster for Linux does not support the Basic Asynchronous mode. The asynchronous replication process reads the I/O from the journal and replicates it, using current methodologies, to destination P6000/EVA.

Metrocluster with Continuous Access XP P9000 for Linux

Metrocluster with Continuous Access XP P9000 for Linux provides automated failover of Serviceguard packages between primary and recovery sites.

In addition, Metrocluster with Continuous Access XP P9000 for Linux B.12.00.00 provides the following new features:

- **Support for Device Group Monitor**

DGM provides the capability to monitor the status of the Continuous Access device groups configured in a Metrocluster package. Device Group Monitor provides the following functionalities:

- Sends a notification message upon the change in a device group status.
- Performs automatic resynchronization of the Continuous Access device group upon link recovery.

- **Support for HPE XP P9000 Storage Family**

Starting with this version, Metrocluster with Continuous Access XP P9000 for Linux includes support for XP20000/XP24000/P9500 disk arrays.

- **Support for Remote Command Device**

Metrocluster with Continuous Access XP P9000 for Linux includes support for remote command device. A remote command device is a device to which a command device in a remote P9000 array is mapped. A remote array P9000 RAID Manager must be configured using the remote command device. Using a remote array RAID manager instance, it is possible to get the status of the device group on the remote P9000 array even when the remote hosts are inaccessible.

The remote command device can be configured using one of the following methods:

- Using the P9000 external storage feature
- Using an extended SAN

Features not supported

The following features are not supported:

- Localization in Simplified Chinese and Japanese.
- Alert generation for manual site switching failover mode.

Metrocluster with 3PAR Remote Copy for Linux

- Synchronous Long Distance configuration
- Unidirectional Remote Copy configuration
- 3PAR Remote Copy volume groups configured with `fail_wrt_on_err` policy

Metrocluster with Continuous Access EVA P6000 for Linux

The following P6000 Continuous Access features are not supported with Metrocluster with Continuous Access EVA P6000 for Linux:

- Asynchronous Replication Mode
- Failsafe-Locked Mode

- Storage Management Appliance (SMA)
- No support for online reconfiguration of the package

HPE Serviceguard Manager (UI) for Linux does not support configuration, monitoring, and administration of Metrocluster modular packages with EVA P6000.

Metrocluster with Continuous Access XP P9000 for Linux

The following features introduced in HPE Storage P9000 RAID Manager are not supported with Metrocluster:

- Virtual Command Device via LAN
- Copy Group configuration based on RAID
- User Authentication based on Command Device
- Resource Group Control

Online modification of the package

Metrocluster with Continuous Access XP P9000 for Linux does not support online reconfiguration of the package.

HPE Serviceguard Manager (UI) for Linux does not support configuration, monitoring, and administration of Metrocluster modular packages with Continuous Access XP P9000.

Metrocluster with EMC SRDF

HPE Serviceguard Manager (UI) for Linux does not support configuration, monitoring, and administration of Metrocluster modular packages with EMC SRDF.

Continentalclusters

Creating and Monitoring Continentalclusters from SGMgr is not supported.

Compatibility matrix

For information on compatible Serviceguard version, Linux OS versions, and so on, see the latest version of *HPE Serviceguard Toolkit Compatibility Matrix* available at <http://www.hpe.com/info/linux-serviceguard-docs>.

Installation

With A.12.00.50 release, the following products are installed with Enterprise bundle:

- Oracle Data Guard Toolkit for Linux
- Metrocluster with EMC SRDF

For more information on installation instructions, see the *HPE Serviceguard for Linux Enterprise edition Release Notes* available at <http://www.hpe.com/info/linux-serviceguard-docs>.

Defects fixed

The list of defects fixed in HPE Serviceguard for Linux Enterprise edition 12.20.00 and its relevant details can be found in *HPE Serviceguard for Linux Cumulative Update Release changes* guide at https://support.hpe.com/hpsc/doc/public/display?docId=emr_na-a00038449en_us.

Known problems and limitations

The known problems and limitations with HPE Serviceguard are as follows:

- QXCR1001609693 — Cluster verification fails when cluster is configured with AOAI workloads for volume group consistency checks done as part of cluster verification.

Workaround

You can ignore this failure.

- QXCR1001552802 — When you view the rehearsal status from a node that is halted, the status of the target node running the rehearsal is shown as **unknown** even when the target node is up.

Workaround

View the rehearsal status from a node that is up and running.

- QXCR1001553032 — Package names ending with `package` fail during rehearsal if included with “Package scope”.

Workaround

Rehearse the packages ending with `package` name at site or node rehearsal scope.

Or

Rehearse the packages ending with `package` name with one package at a time, using `package` rehearsal scope.

- QXCR1001555757 — SSH connection to 3PAR arrays might occasionally fail with return code 254 & 255.

The following are the known issues with Serviceguard Manager:

QXCR1001379443—Adding a new site must not affect the existing site definition

There are no known issues and limitations for Oracle Data Guard toolkit.

There are no known problems and limitations in Metrocluster with 3PAR Remote Copy for Linux, Metrocluster with Continuous Access EVA P6000 for Linux, Metrocluster with Continuous Access XP P9000 for Linux, and Metrocluster with SRDF for Linux.

Deprecated or obsolete features

Serviceguard A.12.10.00 onwards is not supported on RHEL 5.

References

The following are the references available for Metrocluster:

- *Understanding and Designing Serviceguard Disaster Recovery Architectures*
- For 3PAR Storage Systems and 3PAR Remote Copy documents, see the following documents:
 - *3PAR Remote Copy User Guide* available at <http://www.hpe.com/info/storage/docs>.
 - *3PAR InForm OS Concepts Guide* available at <http://www.hpe.com/info/storage/docs>.
 - *3PAR CLI Administrator Manual* available at <http://www.hpe.com/info/storage/docs>.
- For more information on P6000/EVA disk array with P6000 Continuous Access, see the following list of the documents:
 - HP P6000 Enterprise Virtual Array Compatibility Reference Guide
 - HP P6000 Command View User Guide
 - HP P6000 Command View Release Notes
 - HP P6000 Command View Installation Guide
 - HP Storage System Scripting Utility Reference Guide
 - HP P6000 Replication Solution Manager User Guide
 - HP P6000 Continuous Access EVA Replication Performance Estimator Application Notes
- For documentation on P9000 disk arrays with Continuous Access for P9000, see the following documents:
 - *HP StorageWorks P9000 Business Copy User Guide*
 - *HP StorageWorks P9000 Continuous Access User Guide*
 - *HP StorageWorks P9000 Raid Manager User Guide*
 - *HP StorageWorks P9000 Remote Web Console User Guide*
- For documentation on XP disk array with Continuous Access XP, see the following documents:
 - *HP StorageWorks Disk Array XP Business Copy User's Guide*
 - *HP StorageWorks Disk Array XP Continuous Access User's Guide*
 - *HP StorageWorks Disk Array XP Raid Manager User's Guide*
 - *HP StorageWorks Disk Array XP Remote Web Console User's Guide*
- For Metrocluster with EMC SRDF document, see the following documents:
 - HPE Serviceguard Metrocluster with EMC SRDF for Linux B.12.00.50 for Linux user Guide available at <http://www.hpe.com/info/linux-serviceguard-docs>.
 - EMC® Symmetrix® Remote Data Facility (SRDF®) Product Guide at <http://support.emc.com>.
Building Disaster Recovery Serviceguard Solutions Using Metrocluster with EMC SRDF for Linux B.01.00.00

Related information

The following listed documents for Serviceguard for Linux are available in English at <http://www.hpe.com/info/linux-serviceguard-docs>.

- HPE Serviceguard Metrocluster with EMC SRDF for Linux
- HPE Serviceguard Toolkit for KVM on Linux User Guide
- HPE Serviceguard Toolkit for Oracle Data Guard on Linux User Guide
- *HPE Serviceguard for Linux Base edition Release Notes*
- *HPE Serviceguard for Linux Advanced edition Release Notes*
- *HPE Serviceguard for Linux Enterprise edition Release Notes*
- *Managing HPE Serviceguard for Linux*
- *HPE Serviceguard Toolkit for Oracle on Linux User Guide*
- HPE Serviceguard Toolkit for Oracle on Linux Release Notes Version
- *Building Disaster Recovery Serviceguard Solutions Using Metrocluster with 3PAR Remote Copy for Linux*
- Metrocluster with 3PAR Remote Copy for Linux Version Release Notes
- Building Disaster Recovery Serviceguard Solutions Using Metrocluster with Continuous Access XP P9000 for Linux
- Metrocluster with Continuous Access XP P9000 for Linux Version Release Notes
- *Building Disaster Recovery Serviceguard Solutions Using Metrocluster with Continuous Access EVA P6000 for Linux*
- Metrocluster with Continuous Access EVA P6000 for Linux Version Release Notes
- HPE Serviceguard Quorum Server for Linux Version Release Notes
- HPE Serviceguard Toolkit for SAP Sybase ASE and SAP Sybase Replication Server for Linux Release Notes
- HPE Serviceguard Toolkit for SAP Sybase ASE and SAP Sybase Replication Server for Linux User Guide
- HPE Serviceguard Toolkit for EnterpriseDB PPAS for Linux Release Notes
- HPE Serviceguard Extended Distance Cluster for Linux Deployment Guide
- *Managing HPE Serviceguard Extension for SAP for Linux Version*
- *Serviceguard Extension for SAP Version Release Notes for Linux*
- Building Disaster Recovery Serviceguard Solutions Using Metrocluster with EMC SRDF for Linux

Software availability

HPE Serviceguard for Linux 12.10.00 Release Notes is available only in English.

Support and other resources

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:
www.hpe.com/assistance
- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:
www.hpe.com/support/hpesc

Information to collect

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.
- To download product updates, go to either of the following:
 - Hewlett Packard Enterprise Support Center **Get connected with updates** page:
www.hpe.com/support/e-updates
 - Updates location:
<http://www.hpe.com/downloads/software>
- To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to Support Materials** page:
www.hpe.com/support/AccessToSupportMaterials

**IMPORTANT:**

Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HP Passport set up with relevant entitlements.

Websites

Website	Link
Hewlett Packard Enterprise Information Library	www.hpe.com/info/enterprise/docs
Hewlett Packard Enterprise Support Center	www.hpe.com/support/hpesc
Contact Hewlett Packard Enterprise Worldwide	www.hpe.com/assistance
Subscription Service/Support Alerts	www.hpe.com/support/e-updates
Software Depot	www.hpe.com/support/softwaredepot
Customer Self Repair	www.hpe.com/support/selfrepair
Insight Remote Support	www.hpe.com/info/insightremotesupport/docs
Serviceguard Solutions for HP-UX	www.hpe.com/info/hpux-serviceguard-docs
Single Point of Connectivity Knowledge (SPOCK) Storage compatibility matrix	www.hpe.com/storage/spock
Storage white papers and analyst reports	www.hpe.com/storage/whitepapers

Customer self repair

Hewlett Packard Enterprise customer self repair (CSR) programs allow you to repair your product. If a CSR part needs to be replaced, it will be shipped directly to you so that you can install it at your convenience. Some parts do not qualify for CSR. Your Hewlett Packard Enterprise authorized service provider will determine whether a repair can be accomplished by CSR.

For more information about CSR, contact your local service provider or go to the CSR website:

www.hpe.com/support/selfrepair

Remote support

Remote support is available with supported devices as part of your warranty or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which will initiate a fast and accurate resolution based on your product's service level. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

For more information and device support details, go to the following website:

www.hpe.com/info/insightremotesupport/docs

Documentation feedback

Hewlett Packard Enterprise is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback (docsfeedback@hpe.com). When submitting your feedback, include the document title, part number, edition, and publication date located on the front cover of the document. For online help content, include the product name, product version, help edition, and publication date located on the legal notices page.