Overview

HPE Serviceguard for Linux (SGLX)

HPE Serviceguard for Linux is a high availability (HA) and disaster recovery (DR) clustering software designed to protect applications and services from planned and unplanned downtime.

HPE Serviceguard for Linux (SGLX) is designed to deliver 24x7 application availability by continuously monitoring the health of the infrastructure and other resources which may impact availability of the workload. In the event of a failure or incident affecting the application or any of the resources required by the protected applications / workloads, SGLX automatically moves the application / workload, along with its associated resources, to other servers or VMs belonging to the cluster. These resources can be on-premise, in the cloud or in HPE GreenLake environments. Applications can also be moved manually to perform system maintenance or upgrades. SGLX quickly responds to failures in server, storage, network, SAN & LAN connectivity, processes, memory, disk, operating environments, or threats.

SGLX Flex Storage add-on delivers a flexible HA and DR solution for applications deployed on any storage architecture including persistent memory, local, direct-attached, disaggregated storage, and HCI. With this add-on, it's possible to create highly available environments without shared storage for applications such as S4/HANA and NFS.

This QuickSpecs has two sections, first one covers the latest SGLX version 15.00.00 and the second covers the prior SGLX version 12.00.00

HPE Serviceguard for Linux (SGLX) A.15

HPE SGLX latest version 15 is a simplified offering with two foundational editions: SGLX High Availability (HA) E5 edition and SGLX High Availability (HA) plus Disaster Recovery (DR) E7 edition. HPE SGLX offers several add-ons for popular enterprise applications and databases to enable seamless out-of-the-box integration into an HPE Serviceguard cluster. The portfolio includes add-on integration for SAP (SAP HANA®, SAP S/4HANA®, SAP NetWeaver®, NFS), Oracle®, Microsoft SQL Server on Linux, and NFS. HPE SGLX also offers bundled add-ons for databases such as IBM DB and Enterprise DB. It also has a generic toolbox that allows integrating any custom application with SGLX to enable HA / DR for the application.

Notes: For more details on interoperability and supported servers, storage, SAN connectivity options, hypervisors, OS Versions and ISV Versions, or specific conditions and prerequisites, refer **HPE SGLX v15 Certification Matrix**.

What's New in A.15.20.00

Refer to the **HPE SGLX v15 Certification Matrix** for prerequisites and conditions for new or existing features.

- Self-install wizard for easy installation, and deployment of HPE SGLX with SAP HANA, Oracle, Microsoft SQL Server, NFS and custom workloads.
- Centralized licensing Management (CLM) from HPE Serviceguard Manager+ UI allows central management of subscription usage
- Multi-SID SAP HANA system support
- Cross subnet with quarantine and SAP HANA alias support for SAP HANA multi-target deployments
- Enhanced Push button recovery to support application-based data replication across two sites for Oracle with Oracle Data Guard as well as for the custom applications using Flex Storage Add-on (DRBD based data replication).
- Workload mobility feature supports application-based replication topologies for Oracle as well as for custom applications using SGLX Flex Storage Add-on DRBD based replication.
- Supports high availability and monitoring capabilities for Microsoft SQL AOAI containers deployed in Kubernetes environments
- Configure unified bundle of Quorum server and SGMGR+ (UI) on a single compute node

Standard Features

HPE Serviceguard for Linux 15.00.00

HPE Serviceguard for Linux 15.00.00 and later is available in two simplified, easy-to-order editions: SGLX High Availability (HA) E5 and SGLX High Availability (HA) plus Disaster Recovery (DR) E7. The 'out of the box ready' application integrations can be ordered through application specific Add-ons. Add-ons are available for the following enterprise databases and business software:

- SAP (includes SAP NetWeaver, SAP S/4 HANA (application tier))
- Oracle
- Microsoft SQL Server on Linux
- NFS
- Flex Storage

Notes:

- [1] Currently, SGLX only supports BYOL on Amazon Web Services, Microsoft Azure and Google Cloud Platform
- Add-ons for IBM Db2, Sybase, and EnterpriseDB, need not be ordered separately and these can be used free of charge with E5 or E7.

HPE Serviceguard for Linux is available with 1-year, 3-year and 5-year terms. It is also available with HPE GreenLake to enable customers to get the speed, scalability, and economics of cloud. HPE SGLX is also available through Azure Marketplace as BYOL (Bring Your Own License) model.

HPE Serviceguard for Linux High Availability (HA) E5 edition

HPE Serviceguard for Linux HA E5 edition is the high availability solution in the Serviceguard portfolio. It is appropriate for applications that need protection against downtime and have only single-target replication in the environment or have shared storage.

Features:

- Fastest detection and failover / switchover initiation for the workloads to minimize the RTO (Recovery Time Objective)
- Automatic and robust application failover preserving data integrity – zero RPO (Recovery Point Objective).
- Uniform experience in On-premises, Cloud and GreenLake environments
- Out-of-box infrastructure monitors for servers, network, HPE storage, root disks for easy installation and configuration.
- Browser-based GUI for easy monitoring and manageability
- REST API interfaces to integrate with manageability tools
- Out-of-box integrations to deploy several applications like SAP HANA, Oracle, SQL Server, IBM DB2, Enterprise DB
- GUI based Generic toolbox to help deploy any custom application with ease in a SGLX cluster for HA protection
- Real time analytics and reporting of the cluster configuration and consistency
- New workload centric UI to allow monitoring of workload health, and health of the associated data replication mechanism as well as the node hosting the application / workload
- Smart quorum arbitrator technology to ensure highest levels of uptime for workloads

HPE Serviceguard for Linux High Availability (HA) plus Disaster Recovery (DR) E7 edition

High Availability HA DR E7 edition brings in automated and automatic disaster recovery capabilities along with High Availability. Customers can configure an automated recovery on a near DR site and a push button recovery on a far DR site. SGLX HA DR E7 is required for deployments having more than 1 target replications, as well as in the deployments needing DR capabilities listed later in this document. This edition includes all Serviceguard for Linux HA E5 features as well as additional capabilities as follows:

Features:

- Simple, intuitive UI to monitor workload and data replication health for workloads deployed with multi-target replication.
- Automatic and manual workload transfer within and across hybrid environments (On-premises, GreenLake, cloud)
- Disaster Rehearsal - Before an actual disaster occurs, simulate rehearsal of application / workload recovery.
- SAP HANA Scale-out up to 32- nodes configuration
- Push button recovery across geographies.

Standard Features

HPE Serviceguard for Linux SAP Add-On

HPE Serviceguard for Linux SAP add-on is an out-of-the-box integration for **SAP NetWeaver, S/4 HANA application tier.** This add-on delivers:

- Unmatched availability for HANA database deployments. Enables business to achieve higher uptimes and protect critical applications from local as well as complete site failures.
- The industry first fully automatic solution that leverages HANA Multitarget system replication to provide unattended recovery across multiple HANA tiers
- Best in class availability for SAP HANA, using proprietary Safesync and SADTA technologies to ensure data consistency
- Scalability up to 32 production nodes for SAP HANA scale-out deployments in a 64-node DR cluster across two sites

HPE Serviceguard for Linux Oracle Add-On

HPE Serviceguard for Linux Oracle add-on is an out-of-the-box integration for Oracle Single Instance and for Oracle Data Guard. This add-on delivers:

- Accelerated DB recovery with native DB replication technology: Oracle Data Guard (HA & DR with automated role management for two standby's).
- Accelerated Oracle Database recovery to as many targets supported by Oracle Data Guard
- Database recovery with shared storage

HPE Serviceguard for Linux Microsoft SQL Server Add-On

HPE Serviceguard for Linux Microsoft SQL Server for Linux add-on is an out-of-the-box integration for Microsoft SQL Server application. This add-on delivers:

- Accelerated DB recovery with native DB replication technology: Microsoft always on availability groups
- DB recovery using shared storage technology

HPE Serviceguard for Linux NFS Add-On

HPE Serviceguard for Linux NFS add-on is an out-of-box integration that allows customers to easily build a highly available Network File Server. It starts, stops, monitors and on failure automatically recovers a Network File System. It simplifies making NFS exports highly available using SGLX.

HPE Serviceguard for Linux Flex Storage Add-On

HPE Serviceguard for Linux Flex Storage add-on delivers a flexible HA and DR solution for applications deployed on any storage architecture including persistent memory, local, direct-attached, disaggregated storage, and HCI. It can be added to any SGLX solution, eliminating the need for shared storage to achieve HA/DR. This add-on delivers:

- Improved TCO by enabling enterprise-grade HA solutions on cost-effective storage architectures with no dependence on traditional SAN
- Enable faster adoption of new software-defined technologies with uncompromised availability leveraging a unified repeatable HA architecture
- Ability to create highly available environments without shared storage for applications such as S4/HANA and NFS

Standard Features

Table below compares SGLX Editions

Table 1: Key HPE Serviceguard for Linux Capabilities	SGLX HA E5	SGLX HA DR E7
Coordinated recovery with Single Target data Replication setup **Notes:** Storage data replication between the 2 devices or application level replication (e.g. Oracle Data Guard, HANA SR) to 1 destination	√	√
Coordinated recovery with Multi-target data Replication setup **Notes:** The data is replicated from 1 source to more than 1 destinations. It can be storage level replication or application level replication		√
Coordinated recovery with Shared storage (FC or iSCSI) [Includes Storage based replications, Extended Distance Cluster XDC]	√	√
Key Analytics – Replication Status, Historical Downtime, Failover Trends etc.	√	√
Custom workloads: SGLX Framework allows integrating with several applications such as EPIC, MySQL, PostgreSQL etc.	√	√
New GUI for workload and replication status monitoring	√	√
SGLX administration UI for cluster configuration, application integration and administration etc	√	√
Recovery in Hybrid Deployment (across OnPrem, Cloud or Greenlake)		√
Workload Mobility - Move workloads across hybrid environments (across OnPrem, Cloud or Greenlake)		√
DR Rehearsal		√
Recovery with Zerto, VMware SRM		√
SAP HANA Capabilities		
SAP HANA Scale-out deployments		√
HANA Multi-Target Scale-up deployments		√
Backlog Threshold Violation Monitoring for Asynchronous HANA System Replication		√
NFS Add-on	Licensed separately	Included with E7 & SAP Add-on Combo

HPE Serviceguard for Linux 12.00.00 (Prior Version)

HPE Serviceguard for Linux 12..xx.xx is available in four editions: Base, Advanced, Enterprise and Premium along with Flex Storage Add-On and Application Integration Toolkits.

HPE Serviceguard for Linux offers out-of-the-box integration called Toolkits for several popular enterprise grade applications to enable quick integration of the applications into a Serviceguard cluster. The portfolio includes toolkit integration for SAP HANA, SAP S/4 HANA, SAP NetWeaver, Oracle, Microsoft SQL Server on Linux, and IBM Db2 among others. SGLX also offers toolkits for open source applications and databases such as NFS, My SQL, Postgres, Apache, Tomcat and others available at no charge.

In addition to high availability within a data center, HPE Serviceguard for Linux offers a powerful and comprehensive suite of disaster recovery (DR) solutions. SGLX provides a choice of both fully automatic and push button recovery solutions that are tightly integrated with several array based, host based and database native replication technologies.
HPE Serviceguard for Linux is available with 1-year licensing options. It is also available with HPE GreenLake to enable customer get the speed, scalability, and economics of the public cloud in the privacy of their data center.

HPE Serviceguard for Linux Base edition

HPE Serviceguard for Linux Base edition is the basic product in the Serviceguard portfolio. It is appropriate for applications that need protection against downtime and with only one cluster in the environment. The Base edition includes the Serviceguard core and enhanced Serviceguard Manager for single cluster management.

Features:

- Automatic and robust application failover preserving data integrity. Ability to create large clusters of up to 32 nodes
- Out-of-box network monitors, Failover IP addresses along with application failover
- Out-of-box application storage and root disk monitors, Wide support for storage and file systems to use with applications.

Standard Features

- Actively host applications on all cluster nodes, advanced features to minimizes downtime during maintenance upgrades
- Serviceguard Manager browser based GUI for easy manageability, REST API to integrate with manageability tools
- Out-of-box integrations to deploy popular Open Source and Linux standard services such as NFS, Apache among others
- GUI based Generic toolbox to help deploy any custom application with ease in a SGLX cluster for HA protection
- One click cluster configuration consistency check with actionable reports

HPE Serviceguard for Linux Advanced edition

HPE Serviceguard for Linux Advanced edition is ideal for customers who want to integrate database and applications such as Oracle or SAP into Serviceguard clusters with ease, reducing setup time. In addition to the Base edition features, it provides applications with monitoring capabilities from a single place and the ability to take appropriate actions in case of failures. Coupled with multi-cluster capability, it provides a one-stop solution for managing High Availability clusters in a data center. This edition includes the Serviceguard for Linux Base components, new Serviceguard Manager for multi-cluster management and the toolkits for business software and databases such as Oracle database, SAP NetWeaver, SAP S/4 HANA (application tier), SAP Sybase ASE and SAP Sybase Replication Server, Microsoft SQL Server on Linux, IBM DB2, EnterpriseDB PPAS and KVM as a package.

Features:

- Out-of-the-box integration toolkits for popular enterprise databases and business software such as SAP NetWeaver, SAP S/4 HANA (application tier), Oracle, Microsoft SQL Server on Linux, IBM Db2, Sybase, and EnterpriseDB.
- Simple, intuitive manageability tool with Multi-cluster management through new Serviceguard Manager

HPE Serviceguard for Linux Enterprise edition

HPE Serviceguard for Linux Enterprise edition brings in disaster recovery capability and it is designed for customers who want to protect their applications against site outages up to any distance, where roundtrip network latency between the sites is lower than 200ms; it includes all features available with Advanced edition. This edition provides automatic, bi-directional failover and failback across data centers up to several hundred miles apart. Both data centers protected by the Enterprise edition can be active, protected and capable of providing application failover for each other. SGLX provides three different Disaster Recovery solutions built around host-based replication technologies called Extended Distance Clusters (XDC) suitable for WAN distances (100Km / 60 Miles apart), storage-array based replication technologies called Metrocluster, suitable for datacenters spread across several hundred kilometers, and accelerated database recovery based on automatic role management of database native replication technologies.

- XDC - Supported host based replication technologies:
  - LVM Mirroring
  - VxVM Mirroring
  - MD Raid Mirroring
  - Oracle ASM Mirroring (for Oracle databases)
- Metrocluster - Supported storage-array based replication technologies:
  - HPE Alletra 9000 Remote Copy
  - HPE Primera Remote Copy
  - HPE 3PAR Remote Copy (Including support for 3 data center architecture with SLD)
  - XP8/XP7/P9000 Continuous Access
  - HPE P6000/EVA Continuous Access
  - EMC Symmetrix Remote Data Facility (SRDF)
- Accelerated DB failover - Supported DB native replication technologies:
  - SAP HANA System Replication (scale-up and scale-out)
  - Oracle Data Guard (HA & DR with automated role management for two standby's)
  - Microsoft always on availability groups

Features:

- Disaster recovery across large distances, provided network requirements of the underlying replication technologies are met. SGLX requires a minimum latency of only 200 milliseconds between clusters nodes.
- RPO sensitive recovery to ensure data consistency and data currency on recovery
- Proprietary smart quorum technology to ensure highest levels of uptime for your workloads
- Best in class availability for SAP HANA, using propriety Safesync and SADTA technologies to ensure data consistency
- Synchronous or asynchronous replication options give you the flexibility to match RTO/RPO needs
- Improve utilization through support for Active-Active topologies and bidirectional failover between cluster sites

Standard Features

- Flexible deployment models that allow optimization and consolidation of multiple primary workloads to minimally provisioned DR infrastructure
- Scalability up to 32 production nodes for SAP HANA scale-out deployments in a 64-node DR cluster across two sites
- One click Non-disruptive validation of DR readiness by rehearsing recovery of workloads on secondary site

HPE Serviceguard for Linux Premium edition for SAP HANA

HPE Serviceguard for Linux Premium edition brings in unmatched availability for SAP HANA workloads by providing fully automatic HA & DR capabilities for multiple scale-up HANA database tiers. The solution leverages multi-target SAP HANA system replication. The databased tiers can be located within a data center or spread across distances. This enables customers to achieve higher availability for their critical SAP HANA environment with multiple redundancy levels that are seamlessly managed and protected.

Features

- Unmatched availability for HANA database deployments. Enables business to achieve higher uptimes and protect critical applications from complete site failures with enhanced redundancy stretching across multiple HANA tiers.
- SGLX Premium offers the industry first fully automatic HA and DR solution that leverages HANA Multitarget system replication to provide unattended recovery across multiple HANA tiers.
- Customers can now increase their availability levels by deploying up to three HANA standby instances in a SGLX cluster to achieve DR for their production instance and also achieve full HA capability when operating from the DR site.
- Eliminate operational complexity: On recovery of primary site, customers can automatically reinstate HANA standby instances into the cluster and seamlessly move back operations when desired.
- Co-ordinated recovery of S/4 HANA, NetWeaver: Consolidate SAP applications (S/4 HANA, NetWeaver) in the same cluster to achieve coordinated failover of application and DB layer

HPE Serviceguard for Linux Flex Storage Add-On

HPE Serviceguard for Linux Flex Storage add-on delivers a flexible HA and DR solution for applications deployed on any storage architecture including persistent memory, local, direct-attached, disaggregated storage, and HCI. You can create highly available environments without shared storage for applications such as S4/HANA and NFS. This is available as an add-on for all SGLX editions. This can be added with any of the existing SGLX solutions and eliminate the need for shared storage to achieve HA/DR.

The Flex Storage Add-On is sold per instance and requires one LTU per cluster node.

- SGLX Flex Storage delivers a flexible HA and DR solution for applications deployed on any storage architecture including persistent memory, local, direct-attached, disaggregated storage, and HCI
- Improved TCO by enabling enterprise-grade HA solutions on cost-effective storage architectures with no dependence on traditional SAN
- Enable faster adoption of new software-defined technologies with uncompromised availability leveraging a unified repeatable HA architecture
- Create highly available environments without shared storage for applications such as S4/HANA and NFS

Standard Features

HPE Serviceguard for Linux – Integration Toolkits for Open Source and Linux Standard Application

- **HPE SGLX Network File System (NFS) Toolkit:** Out-of-box integration that allows customers to easily build a highly available Network File Server. It starts, stops, monitors and on failure automatically recovers a Network File System. It simplifies making NFS exports highly available using SGLX, download **here** at no extra cost with SGLX Base Editions.

- **HPE SGLX Contributed Application Integration Toolkits**: A collection of out-of-box integrations for popular open source applications such as **Apache, MySQL, PostgreSQL, Samba, Tomcat, Sendmail.** It enables customers to easily integrate these applications in a SGLX cluster for HA/DR protection it is available at no extra cost with any SGLX Edition

Notes: SGLX provides tightly integrated solution offerings for specific third-party software like Oracle, SAP S/4 HANA, SAP NetWeaver, SAP HANA, Microsoft SQL Server etc. and open source components like MD RAID and LVM mirroring etc. These product offering are fully supported by HPE and the scope for such support is limited to the functionality offered by the SGLX integration. These components have their own support policies, limitations or requirements that are defined and governed by the vendor. Any issues or concerns with the behavior of these components may require assistance from the vendor and in some cases may also require fixes. For more details on SGLX support policies please refer to **HPE Serviceguard for Linux (SGLX) Support Letter**. For more information on list of certified servers, storage, operating systems, virtualization software's, 3rd party software etc. please refer to the **HPE SGLX Certification Matrix**.

HPE Serviceguard Manager Capabilities

The next generation manageability tool for Serviceguard for Linux, is a modern, simple and intuitive experience that aligns with current trends and the user experience of the HPE OneView.

- Multi-cluster management - Configure, monitor and administrate multiple clusters across your data center
- Workload based view for SAP, Oracle and MS SQL deployments that provide a consolidate view of all packages
- Manage cluster remotely from any system with a browser, by connecting to any SGLX node in the configured landscape.
- Simplified Easy Deployment – Create a cluster and packages to protect workloads with few simple click
- Manage with confidence - Color-coded, graphically-intuitive icons to represent status change and configuration information
- Flexibility to define the scope of management from a single subnet to an entire enterprise network.
- Role-based access to manage user level access to clusters and activities they can performs, Comprehensive online help.
- Dashboard- A single pane to view, understand and navigate all resources and entities distributed across cluster
- Performance Analytics - Visualize performance and analyze trends and patterns in resource behavior.
- Property sheets for detailed information about clusters, nodes and packages and activity Logs for all operations performed
- SGLX provides REST API interfaces for all key administrative operations to enable management from orchestration tools

Table 2: SGLX Solution for SAP HANA Database

HPE SGLX solutions for SAP HANA (Predefined Solution, TDI, ConvergedSystems)	SGLX Enterprise for HANA	SGLX Premium for HANA
SGLX Solutions for SAP HANA Scale-up Database	√	√
SGLX Solutions for SAP HANA Scale-out Database	√	√
SGLX Solutions for SAP HANA **Multi-Tier** Scale-up Database		√

Notes: Refer Table 7 (subscription) in Configuration Information Section for SKU details

Standard Features

Table 3: SGLX Solutions listed by SGLX Editions			
HPE Serviceguard for Linux Solutions	**Base**	**Advanced**	**Enterprise**
Serviceguard for Linux (SGLX) – **Clustering Engine** for custom workloads	√	√	√
SGLX Enhanced GUI **(Single cluster management)**	√	√	√
SGLX Enhanced GUI **(Multi cluster management)**		√	√
HA for **Oracle Database** (Oracle DB recovered from shared storage on standby node)		√	√
Extension for SAP (**HA for NetWeaver & S/4 HANA application tier**)		√	√
HA toolkit for **SAP Sybase** ASE and SAP Sybase Replication Server for Linux		√	√
HA toolkit for **EnterpriseDB PPAS**		√	√
HA for **SQL Server on Linux** (Always On Failover Instance)		√	√
HA toolkit for **IBM Db2**		√	√
HA toolkit for **KVM (**RHEL and SLES)		√	√
Extension for SAP **(DR for NetWeaver & S/4 HANA application tier)**			√
Accelerated HA & DR for Oracle database based on Oracle Data Guard replication			√
Accelerated HA & DR for SQL Server on Linux (Always On Availability Groups)			√
Extended Distance Cluster (XDC based on LVM, VxVM & MD Raid mirroring)			√
Extended Distance Cluster (XDC based on **Oracle ASM** Mirroring for Oracle DB)			√
Metrocluster with **HPE Alletra 9000** Remote Copy for Linux			√
Metrocluster with **HPE Primera** Remote Copy for Linux			√
Metrocluster with **HPE 3PAR** Remote Copy for Linux			√
Metrocluster with **HPE XP8/XP7/P9000** Continuous Access for Linux			√
Metrocluster with **P6000/EVA** Continuous Access for Linux			√
Metrocluster with **EMC** Symmetrix Remote Data Facility (SRDF) for Linux			√

Notes: Refer Table 7 (subscription) in Configuration Information Section for SKU details

Table 4: SGLX Solution Add-On's available with all SGLX editions	
HPE Serviceguard for Linux Flex Storage Add-On (shared nothing deployments) **Notes:** Refer Table 7 in Configuration Information Section for SKU details	**Add-On**
SGLX Solutions for Open Source and Linux Standard Applications NFS, Apache, Tomcat, Samba, My SQL, PostgreSQL, Sendmail **Notes:** Refer Table 8 in Configuration Information Section for download information	**Add-On (at no extra cost)**

Service and Support

HPE Services - Service and Support

No matter where you are in your digital transformation journey, you can count on HPE Services Services to provide the expertise you need, when and where you need it.

Advisory and Professional Services

Our Digital Next Advisory approach can help you identify, prioritize, and implement the right transformation initiatives to create new edge experiences, get real-time insights from all your data, and modernize your IT to enable new opportunities.

Operational Services

Take your IT operations to the next level with expertise and tools that can help save your staff time, manage complexity, and identify new ways to drive efficiency and effectiveness in your IT.

HPE ServicesHPE Tech Care Service

HPE ServicesHPE Tech Care Service is the new operational service experience for HPE products. Tech Care goes beyond traditional support by providing access to product specific experts, an AI driven digital experience, and general technical guidance to not only reduce risk but constantly search for ways to do things better. HPE ServicesHPE Tech Care Service has been reimagined from the ground up to support a customer-centric, AI driven, and digitally enabled customer experience to move your business forward.

Term licenses for HPE Serviceguard for Linux v15 and v12 include HPE ServicesHPE Tech Care Service Essential which provides a 15-minute response time 24x7 with the same duration as the term license. Perpetual licenses for HPE Serviceguard for Linux v12 include 1 year HPE ServicesHPE Tech Care Service Essential with the option to purchase extended duration along with the perpetual license purchase as well as the option to renew Tech Care upon expiration.
https://www.hpe.com/services/techcare

HPE ServicesHPE Complete Care Service

HPE ServicesHPE Complete Care Service is a modular, edge-to-cloud IT environment service that provides a holistic approach to optimizing your entire IT environment and achieving agreed upon IT outcomes and business goals through a personalized and customer-centric experience. All delivered by an assigned team of HPE Services Services experts. HPE ServicesHPE Complete Care Service provides:

- A complete coverage approach -- edge to cloud
- An assigned HPE team
- Modular and fully personalized engagement
- Enhanced Incident Management experience with priority access
- Digitally enabled and AI driven customer experience

https://www.hpe.com/services/completecare

HPE Lifecycle Services

Lifecycle Services provide a variety of options to help maintain your HPE systems and solutions at all stages of the product lifecycle including a broad range of installation services by highly skilled installation consultants. Installation services can be tailored to meet specific needs. For a list of the most frequently purchased services using service credits, see the **Universal Service Credits Menu**

HPE Education Services

Provides comprehensive training designed to expand the skills of your IT staff and keep them up to speed with the latest technologies.

Service and Support

HPE GreenLake brings the cloud experience directly to your apps and data wherever they are—the edge, colocations, or your data center. It delivers cloud services for on-premises IT infrastructure specifically tailored to your most demanding workloads. With a pay-per-use, scalable, point-and-click self-service experience that is managed for you, HPE GreenLake accelerates digital transformation in a distributed, edge-to-cloud world.

- Get faster time to market
- Save on TCO, align costs to business
- Scale quickly, meet unpredictable demand

Simplify IT operations across your data centers and clouds

Managed services to run your IT operations

HPE GreenLake Management Services provide services that monitor, operate, and optimize your infrastructure and applications, delivered consistently and globally to give you unified control and let you focus on innovation.

Warranty

Hewlett Packard Enterprise will replace defective delivery media for a period of 90 days from the date of purchase. This warranty applies to all Serviceguard for Linux products.

For more information

www.hpe.com/services
https://www.hpe.com/us/en/services/operational.html

To learn more on HPE Services, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Contact information for a representative in your area can be found at "Contact HPE"
https://www.hpe.com/us/en/contact-hpe.html

HPE Support Services are sold by HPE and Hewlett Packard Enterprise Authorized Service Partners:

- Services for customers purchasing from HPE or an enterprise reseller are quoted using HPE order configuration tools.
- Customers purchasing from a commercial reseller can find HPE Support Services at **https://ssc.hpe.com/portal/site/ssc/**

Configuration Information

Ordering Information

How to order HPE Serviceguard for Linux version 15

The following products can be ordered through an HPE sales representative or HPE distributor:

- HPE Serviceguard for Linux v15 High Availability E5 edition
- HPE Serviceguard for Linux v15 High Availability and Disaster Recovery E7 edition
- HPE Serviceguard for Linux v15 SAP Add-on
- HPE Serviceguard for Linux v15 Oracle Add-on
- HPE Serviceguard for Linux v15 Microsoft SQL Server Add-on
- HPE Serviceguard for Linux v15 NFS Add-on
- HPE Serviceguard for Linux Flex Storage Add-On

HPE Serviceguard for Linux products are offered in three models as follows

- One year term (including license and Tech Care Essential for one year)
- Three year term (including license and Tech Care Essential for three years)
- Five year term (including license and Tech Care Essential for five years)

Notes:

- Also available with HPE GreenLake
- Term SKUs cannot be combined upfront to create multi-year term license.
- Renewals can be purchased before expiry of term by re-ordering the below SKUs

Licensing Model

Term License to Use (LTU)

The new choice to license Serviceguard for Linux with one, three and five year term licenses with bundled support helps you optimize TCO. Term licenses provide time bound license along with bundled HPE Tech Care Essential for the respective periods. SGLX major versions upgrades will require purchase of new term license. E.g., Upgrade of SGLX v12 to SGLX v15 will require purchase of new SKUs. Term licenses are available only in electronic form (E-LTU). One E-LTU of HPE SGLX v15 HA E5, HPE SGLX v15 HA DR E7 and optional Add-ons (SAP, Oracle, Microsoft SQL and NFS) delivers 2 per-core licenses or 4 vCPU licenses and access to the software electronically. In a physical environment, to determine SGLX license required, calculate the total number of physical CPU cores of each CPU and divide by 2. E.g., For a 4-socket server with Intel Xeon-Platinum 8380H (2.9GHz/28-core/250W) Processor, total cores will be 4*28=112, therefore SGLX license required will be 56 SGLX v15 HA E5 or HA DR E7 E-LTU (licensed per 2-core). In a virtual environment, calculate the total vCPU associated with each VM and divide by 4 (licensed per 4 vCPU). E.g., Two VMs with 9-core each will require, 3 licenses (9/4=2.25, if fraction always round-up to higher digit) for each VM, i.e., total 6 SGLX v15 HA E5 or HA DR E7 E-LTUs are required. Flex storage add-on is licensed per instance. E.g., for 2-node cluster 2 units of SGLX Flex Storage Add-On (one per node) is required. Implementation Services are available and must be ordered separately.

To continue using SGLX, renew the software term license before the end of the term period by ordering an additional one, three or five year term. The license count (LTU count) and the respective expiry dates will be listed through a product utility as well as on Serviceguard Manager GUI. You can also configure email alerts to be sent from the cluster nodes to any required email address. If the license expires or if there are insufficient licenses, the cluster and the application (package) will continue to run for 30 more days (grace period), post which the product will cease to function. You will not be able to perform any further Serviceguard configuration changes on the system during these 30 days.

Once term license is repurchased, you will receive an “entitlement order number” to activate the required number of licenses from the **My License Portal**. The repurchased licenses will be activated on the date you log in and download the license keys. The repurchased license can be downloaded / activated very close to expiry of current term to avoid loss of term days due to overlap with current term. When repurchasing, it is recommended to repurchase all the LTU’s required for a system at the same time.

Configuration Information

Table 5: HPE Serviceguard for Linux Term SKU details

HPE SGLX Editions

High Availability E5

HPE Serviceguard for Linux v15 High Availability E5 2 Cores or 4 vCPUs 1yr Subscription 24x7 E-LTU	S0W12AAE
HPE Serviceguard for Linux v15 High Availability E5 2 Cores or 4 vCPUs 3yr Subscription 24x7 E-LTU	S0W13AAE
HPE Serviceguard for Linux v15 High Availability E5 2 Cores or 4 vCPUs 5yr Subscription 24x7 E-LTU	S0W14AAE
High Availability and Disaster Recovery E7	
HPE Serviceguard for Linux v15 HA and Disaster Recovery E7 2 Cores or 4 vCPUs 1y Sub 24x7 E-LTU	S0W15AAE
HPE Serviceguard for Linux v15 HA and Disaster Recovery E7 2 Cores or 4 vCPUs 3y Sub 24x7 E-LTU	S0W16AAE
HPE Serviceguard for Linux v15 HA and Disaster Recovery E7 2 Cores or 4 vCPUs 5y Sub 24x7 E-LTU	S0W17AAE
SAP Add-on	
HPE Serviceguard for Linux v15 SAP Add-on 2 Cores or 4 vCPUs 1-year Subscription 24x7 E-LTU	S0W18AAE
HPE Serviceguard for Linux v15 SAP Add-on 2 Cores or 4 vCPUs 3-year Subscription 24x7 E-LTU	S0W19AAE
HPE Serviceguard for Linux v15 SAP Add-on 2 Cores or 4 vCPUs 5-year Subscription 24x7 E-LTU	S0W20AAE
Oracle Add-on	
HPE Serviceguard for Linux v15 Oracle Add-on 2 Cores or 4 vCPUs 1-year Subscription 24x7 E-LTU	S0W21AAE
HPE Serviceguard for Linux v15 Oracle Add-on 2 Cores or 4 vCPUs 3-year Subscription 24x7 E-LTU	S0W22AAE
HPE Serviceguard for Linux v15 Oracle Add-on 2 Cores or 4 vCPUs 5-year Subscription 24x7 E-LTU	S0W23AAE
Microsoft SQL Server Add-on	
HPE Serviceguard for Linux v15 Microsoft SQL Server Add-on 2 Cores or 4 vCPUs 1y Sub 24x7 E-LTU	S0W24AAE
HPE Serviceguard for Linux v15 Microsoft SQL Server Add-on 2 Cores or 4 vCPUs 3y Sub 24x7 E-LTU	S0W25AAE
HPE Serviceguard for Linux v15 Microsoft SQL Server Add-on 2 Cores or 4 vCPUs 5y Sub 24x7 E-LTU	S0W26AAE
NFS Add-on	
HPE Serviceguard for Linux v15 NFS Add-on 2 Cores or 4 vCPUs 1-year Subscription 24x7 E-LTU	S0W27AAE
HPE Serviceguard for Linux v15 NFS Add-on 2 Cores or 4 vCPUs 3-year Subscription 24x7 E-LTU	S0W28AAE
HPE Serviceguard for Linux v15 NFS Add-on 2 Cores or 4 vCPUs 5-year Subscription 24x7 E-LTU	S0W29AAE
HPE SGLX Flex Storage Add-On (shared nothing deployments)	
HPE Serviceguard for Linux x86 Flex Storage Add-On 1yr Subscription 24x7 Support per Instance E-LTU	R8V45AAE
HPE Serviceguard for Linux x86 Flex Storage Add-On 3yr Subscription 24x7 Support per Instance E-LTU	R8V46AAE
HPE Serviceguard for Linux x86 Flex Storage Add-On 5yr Subscription 24x7 Support per Instance E-LTU	R8V47AAE

Notes:

- All SGLX term SKUs includes, E-Media, E-License and Tech Care Essential for the term period
- *HPE SGLX High Availability v15 E5 and SGLX High Availability and Disaster Recovery v15 E7 licenses are sold per 2 core or 4 vCPU
- ** HPE SGLX v15 add-ons (SAP, Oracle, Microsoft SQL and NFS) licenses are sold per 2 core or 4 vCPU
- HPE SGLX v15 HA DR E7 plus SAP Add-on bundle includes NFS as default
- #HPE SGLX Flex Storage Add-On is sold per instance and is available as add-on for all SGLX editions

In case of cloud deployments in Azure or AWS or GCP, SGLX follows the “bring your own license” process, that allows customers to use purchased SGLX licenses in those deployments.

HPE Serviceguard for Linux Fixed Support and Services SKUs

All services listed are Fixed SKUs enabled for channel sales. Flex service SKUs are available for direct HPE sales and contract renewals. Contact your HPE sales representative to learn about other available Tech Care and Complete Care options.

Configuration Information

Table 6: SGLX service SKUs
Installation and Deployment Services

Defined Service Description	Fixed SKU
HPE Serviceguard for Linux Installation and Startup Service	U7J40E
HPE Serviceguard Implementation Linux Service	UW811E
	Flex SKU
HPE Serviceguard for Linux Startup SVC	HA124A1#5U5
HPE Serviceguard Implement Linux SVC	HA115A1#5SW

Notes: For needs that go beyond the scope of this service, HPE provides more comprehensive implementation and deployment offerings for specific business needs

HPE Serviceguard for Linux Audit

HPE Custom Per Event Performance Ops SVC	HA332A1

Notes: Ideal for assuring optimal configuration of SGLX environment

HPE Educational Service

HPE Ed HP Serviceguard on Linux Trng	H4C12S

Notes: HPE Serviceguard for Linux Training – Refer **Course Data Sheet** for more details

Ordering Information

How to order HPE Serviceguard for Linux version 12

The following products can be ordered through an HPE sales representative or HPE distributor:

- HPE Serviceguard for Linux x86 Base edition
- HPE Serviceguard for Linux x86 Advanced edition
- HPE Serviceguard for Linux x86 Enterprise edition
- HPE Serviceguard for Linux x86 Premium edition
- HPE Serviceguard for Linux Flex Storage Add-On

In addition, the following are available free of charge

- HPE Serviceguard Toolkit for NFS for Linux
- HPE Serviceguard Contributed Toolkit Suite for Linux

HPE Serviceguard for Linux products is offered as follows

- One year subscription (including license and HPE Tech Care Essential for one year)

Notes:

- Also available with HPE GreenLake
- Subscription SKUs cannot be combined upfront to create multi-year subscription.
- Renewal of support for perpetual license SKUs can be purchased near end of support contract term
- Repurchase of subscription SKU can be purchased close to expiry of term by re-ordering the below SKUs

Licensing Model

Subscription License to Use (LTU)

The new choice to license Serviceguard for Linux with one subscription licenses with bundled support helps you optimize TCO. Subscriptions provide a time bound license along with bundled HPE Tech Care Essential for the respective periods. Subscriptions are available only in electronic form (E-LTU). One E-LTU delivers one per socket license (per instance license in case of Flex Storage Add-On) and access to the software electronically. Implementation Services are available and must be ordered separately.

To continue using SGLX subscriptions repurchase the software subscription close to the end of the subscription period by ordering additional one subscriptions. To continue support and updates for perpetual licenses, renew the support contract before the end of support term.

Configuration Information

The license count (LTU count) and the respective expiry dates will be listed in the product command line and Serviceguard Manager GUI. You can also configure email alerts to be sent from the cluster nodes to any required email address.

For SGLX subscriptions, you are advised to repurchase subscriptions through your HPE sales representative or HPE distributor well in time before the subscriptions expire to avoid any service discontinuity. If the license expires the cluster and the application (package) will continue to run, however you will not be able to perform any further Serviceguard configuration changes on the system and will experience restricted failover protection based on the Serviceguard configuration at the time of license expiry.

Once subscription is repurchased, you will receive an "entitlement order number" to activate the required number of licenses from the **My License Portal**. The repurchased licenses will be activated on the date you log in and download the license keys. To ensure a smooth renewal process please ensure you renew the subscription at least 90 days before expiry of current subscription. The renewal license can be downloaded / activated very close to expiry of current subscription to avoid loss of subscription days due to overlap with current subscription. When renewing it is recommended to renew all the LTU's required for a system at the same time to ease management.

You can easily upgrade from one SGLX edition to another by purchasing the subscription for the required edition at the end or during the current subscription period. Any remaining term on the current subscription will not be carried over during such upgrades. When upgrading all the required LTU's in a system must be upgraded at the same time.
Alternatively you can also choose to move to a perpetual license during or at the end of the subscription period

Table 7: HPE Serviceguard for Linux Subscription SKU details

HPE SGLX solutions for SAP HANA (Predefined Solution, TDI, CS) – Subscription	
Enterprise for SAP HANA	
HPE Serviceguard for Linux x86 Enterprise for SAP HANA 1yr Subscription 24x7 Support PSL E-LTU	R1T36AAE
Premium for SAP HANA	
HPE Serviceguard for Linux x86 Premium for SAP HANA 1-year Subscription 24x7 Support PSL E-LTU	R7P98AAE
HPE SGLX Editions	
Base	
HPE Serviceguard for Linux x86 Base 1yr Subscription 24x7 Support PSL E-LTU	R1T30AAE
Advanced	
HPE Serviceguard for Linux x86 Advanced 1yr Subscription 24x7 Support PSL E-LTU	R1T31AAE
Enterprise	
HPE Serviceguard for Linux x86 Enterprise 1yr Subscription 24x7 Support PSL E-LTU	R1T32AAE
HPE SGLX Flex Storage Add-On (shared nothing deployments)	
HPE Serviceguard for Linux x86 Flex Storage Add-On 1yr Subscription 24x7 Support per Instance E-LTU	R8V45AAE
HPE Serviceguard for Linux x86 Flex Storage Add-On 3yr Subscription 24x7 Support per Instance E-LTU	R8V46AAE
HPE Serviceguard for Linux x86 Flex Storage Add-On 5yr Subscription 24x7 Support per Instance E-LTU	R8V47AAE

Notes:

- All SGLX subscription SKUs includes, E-Media, E-License and Tech Care Essential for the subscription period
- *HPE SGLX Base, Advanced, Enterprise, and Premium editions licenses are sold per socket.
- #HPE SGLX Flex Storage Add-On is sold per instance and is available as add-on for all SGLX editions

Configuration Information

Table 8: SGLX NFS and Contributed toolkit details	
HPE SGLX – Integration for Open Source & Linux Standard Applications*	
HPE SGLX Network File System (NFS) Toolkit	T1442BA
HPE SGLX Contributed Application Integration Toolkits (Apache, MySQL, PostgreSQL, Samba, Tomcat, Sendmail)	SGLXTOOLS

Notes:

- *Available as Add-On with any SGLX edition at no additional cost
- T1442BA – **Download**
- SGLXTOOLS - **Download**

HPE Serviceguard for Linux Fixed Support and Services SKUs

All services listed are Fixed SKUs enabled for channel sales. Flex service SKUs are available for direct HPE sales and contract renewals. Contact your HPE sales representative to learn about other available Tech Care and Complete Care options.

Table 9: HPE SGLX v12 Perpetual Edition Support Options	
Base	
HPE 3 Year Tech Care Essential SGLX Base x86 PSL Service	HY2U7E
HPE 4 Year Tech Care Essential SGLX Base x86 PSL Service	HY2U8E
HPE 5 Year Tech Care Essential SGLX Base x86 PSL Service	HY2U9E
Advanced	
HPE 3 Year Tech Care Essential SGLX Adv x86 PSL Service	HY2V0E
HPE 4 Year Tech Care Essential SGLX Adv x86 PSL Service	HY2V1E
HPE 5 Year Tech Care Essential SGLX Adv x86 PSL Service	HY2V2E
Enterprise	
HPE 3 Year Tech Care Essential SGLX Ent x86 PSL Service	HY2V6E
HPE 4 Year Tech Care Essential SGLX Ent x86 PSL Service	HY2V7E
HPE 5 Year Tech Care Essential SGLX Ent x86 PSL Service	HY2V8E
Premium	
HPE 3 Year Tech Care Essential HPE SGLX Premium HANA 1 year Essential Perp PSL E-LTU Service	H29CDE
HPE 4 Year Tech Care Essential HPE SGLX Premium HANA 1 year Essential Perp PSL E-LTU Service	H29CFE
HPE 5 Year Tech Care Essential HPE SGLX Premium HANA 1 year Essential Perp PSL E-LTU Service	H29CGE

Notes:

- HPE SGLX v12 Perpetual Edition – Support options to add additional years of Tech Care Essential 24x7 support.

Table 10: Upgrade between HPE SGLX v12 Perpetual Edition Support Options	
3 Yr.	
HPE 3 Year Tech Care Essential SGLX Base Advx86PSLUp Service	HY2V3E
HPE 3 Year Tech Care Essential SGLXBaseEntx86PSLUpg Service	HY2W1E
HPE 3 Year Tech Care Essential SGLXAdvEntx86PSLUpgFx Service	HY2W4E
HPE 3 Year Tech Care Essential HPE SGLX Enterprise-Premium Upgrade Perp PSL E-LTU Service	H29BZE
4 Yr.	
HPE 4 Year Tech Care Essential SGLX Adv x86 PSL Upg Service	HY2V4E
HPE 4 Year Tech Care Essential SGLXBase Entx86PSLUpg Service	HY2V9E
HPE 4 Year Tech Care Essential SGLX AdvEnt x86PSLUpg Service	HY2W2E
HPE 4 Year Tech Care Essential HPE SGLX Enterprise-Premium Upgrade Perp PSL E-LTU Service	H29CBE
5 Yr.	
HPE 5 Year Tech Care Essential SGLX BaseAdvx86PSLUp Service	HY2V5E
HPE 5 Year Tech Care Essential SGLX Base Entx86PSLUp Service	HY2W0E
HPE 5 Year Tech Care Essential SGLXAdvEntx86PSLUpgFx Service	HY2W3E
HPE 5 Year Tech Care Essential HPE SGLX Enterprise-Premium Upgrade Perp PSL E-LTU Service	H29CCE

Notes: Upgrade between HPE SGLX v12 Perpetual Editions – Support options to add additional years of Tech Care Essential 24x7 support

Configuration Information

Table 11: SGLX v12 Perpetual Edition Continental Clusters support service Fixed SKUs	
HPE SGLX Continental Clusters – Support Options	
3 Yr.	
HPE 3 Year Tech Care Essential CCLX x86 PSL Service	HY2W5E
4 Yr.	
HPE 4 Year Tech Care Essential CCLX x86 PSL Service	HY2W6E
5 Yr.	
HPE 5 Year Tech Care Essential CCLX x86 PSL Service	HY2W7E

Table 12: Other SGLX service SKUs	
Installation and Deployment Services	
Defined Service Description	**Fixed SKU**
HPE Serviceguard for Linux Installation and Startup Service	U7J40E
HPE Serviceguard Implementation Linux Service	UW811E
	Flex SKU
HPE Serviceguard for Linux Startup SVC	HA124A1#5U5
HPE Serviceguard Implement Linux SVC	HA115A1#5SW
Notes: For needs that go beyond the scope of this service, HPE provides more comprehensive implementation and deployment offerings for specific business needs	
HPE Serviceguard for Linux Audit	
HPE Custom Per Event Performance Ops SVC	HA332A1
Notes: Ideal for assuring optimal configuration of SGLX environment	
HPE Educational Service	
HPE Ed HP Serviceguard on Linux Trng	H4C12S
Notes: HPE Serviceguard for Linux Training – Refer **Course Data Sheet** for more details	

Technical Specifications

HPE Serviceguard for Linux Supported Configuration for version 12

Notes: This is a list of supported configurations at time of writing. For the most up-to-date list of certified servers, storage, operating systems, virtualization software's, 3rd party software's, supported configurations, important notes and caveats refer to the **HPE SGLX Certification Matrix**.

Memory requirements

Serviceguard requires approximately 15.5 MB of lockable memory.

Cluster arbitration requirements

Cluster arbitration is essential to ensure the highest level of availability and data integrity. SGLX provides Cluster Lock LUN and Quorum Sever (QS) based arbitration mechanisms. Arbitration is mandatory for 2-node configurations, it is optional but recommended for 3- to 4-node configurations

Notes:

- One QS can serve a maximum of 300 nodes in up to 150 heterogeneous (Linux / HP-UX) clusters
- Minimum memory requirements 128 MB and Locks up to 16 MB of memory
- Can be deployed on any x86_64 Server, Virtual Machine on premise or cloud (private or public)

Cluster Lock LUN

Utilizes a shared LUN to provide a tie-break (arbitration) mechanism in the event a failure causes a 50% split in the cluster. Cluster Lock LUN requires a dedicated LUN with a minimum size of 100K. This method can be used for a cluster size of up to 4 nodes.

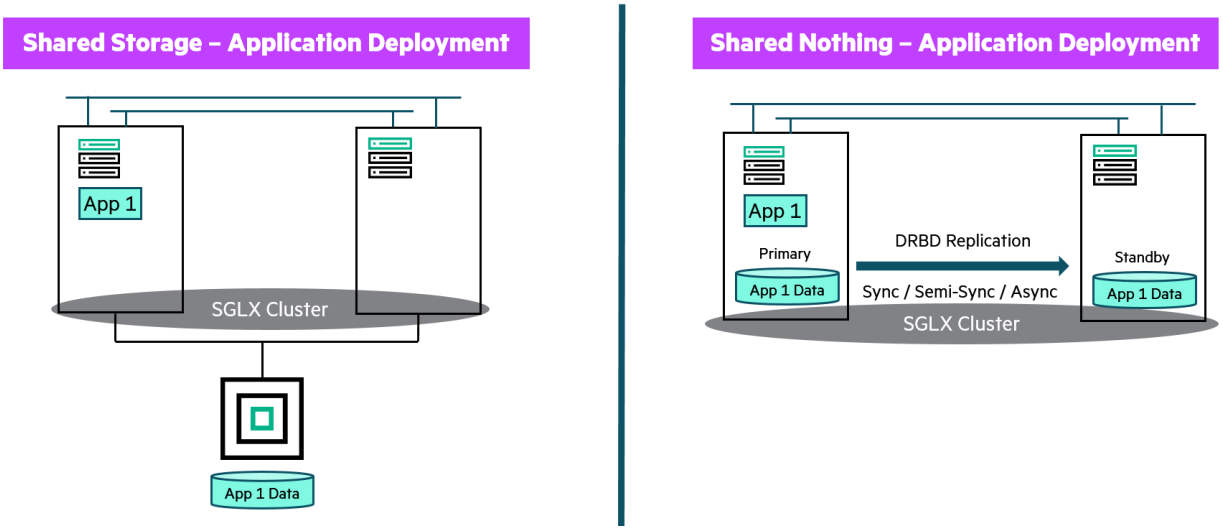
Quorum Service

Runs on a separate server or VM. In case of DR deployments across sites it must be hosted at a third site, to ensure a cluster can create quorum in the event of a site failure. The node on which the Quorum Service is running must have network connectivity to the clusters for which it is providing services. Ensure that the connection with each node is independent of the cluster heartbeat connection so that both are not likely to fail at the same time. The Quorum Service and clustered nodes may be on different subnets. You can also deploy the Quorum Service in a cluster of its own, so it is highly available.

Cluster Types

- Active/Active
- Active/Standby
- Rotating Standby

Cluster Topologies – Storage architecture for application data



Technical Specifications

Max Cluster Nodes

- Shared storage Clusters: Up to 32 nodes (64 Node with 32 nodes on each site in a HANA Scale-Out cluster)
- Shared Nothing Clusters: Up to 3 nodes

Servers

- Supported on any HPE x86_64 server including HPE Superdome Flex, HPE ProLiant, HPE Synergy
- Compatible with any 3rd party x86_64 server

Linux Distributions

- Red Hat Enterprise Linux 8, Red Hat Enterprise Linux 7
- SUSE Linux Enterprise Server 15, SUSE Linux Enterprise Server 12
- Oracle Linux 8, Oracle Linux 7

Hypervisors

- VMware vSphere Hypervisor(ESXi) 7.x, and 6.x
- RHEL 7 and 6, SUSE 15 and 12 based Kernel Virtual Machine (KVM)
- RHEV and Hyper-V based Virtual Machines with iSCSI shared storage.

Fibre Channel, iSCSI and NFS Storage

- Shared Nothing Configuration: For HA & DR - Any storage exposed as block device to applications
- Shared Storage Configuration:
  - For HA: Any storage array that is SCSI-3 PR compliant including HPE Alletra, Primera, 3PAR, Nimble, XP
  - For DR: HPE Alletra 9000 Remote Copy, HPE Primera Remote Copy, HPE 3PAR Remote Copy, HPE P9000/XP7/XP8 Continuous Access, HPE P6000/EVA Continuous Access, and EMC Symmetrix Remote Data Facility (SRDF)

Fibre Channel switches

Switches and hubs supported on selected disk array

Notes: Contact your HPE Storage representative for the latest firmware revision for switch connectivity support on Linux.

Fibre Channel host bus adapters

Notes: For a complete and up-to-date list of supported options on certified servers, please reference the individual QuickSpecs for each server. HPE Serviceguard for Linux supports all Fibre Channel HBA's which would be listed in each supported server's QuickSpecs.

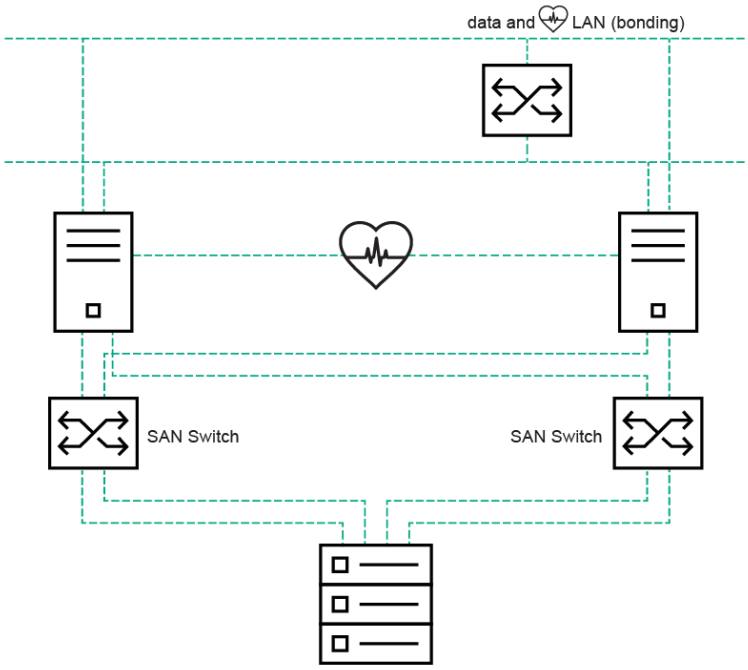
Networking

HPE Serviceguard for Linux recommends redundant networks, even though these are not shown in the diagrams. The redundant client network connections allow local failover from one NIC to another in case of failure in the network path. These connections must be on the same subnet. This is implemented using Channel Bonding. Failover from one NIC to another prevents a package, or the entire system, from failing over to another system. This minimizes impact to the application and to the users.

Typical Cluster Topologies

LAN connection to switches, white papers are available on the Technical documentation section of the HPE Networking web site **http://www.hpe.com/networking**, describing how to set up the LAN environment for the best availability. The key items that need to be in the servers are the correct number and type of LAN connections and the Fibre Channel host bus adapters (HBAs). In a Fibre Channel storage system, the host port interconnects act as an internal switch to provide data-path redundancy. The below diagrams show a dual-controller Fibre Channel system in a switch attach configuration in which host port interconnects are typically enabled in order to provide fault tolerance. When the host port interconnects are enabled, port 0 on each controller is cross-connected to port1 on the other controller. This provides redundancy in the event of failover by making volumes owned by either controller accessible from either controller. Please refer to 3PAR documentation for complete connectivity details.

Technical Specifications



Environment-friendly Products and Approach - End-of-life Management and Recycling

Hewlett Packard Enterprise offers end-of-life HPE product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: **http://www.hpe.com/info/recycle**. To recycle your product, please go to: **http://www.hpe.com/info/recycle** or contact your nearest Hewlett Packard Enterprise sales office. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2011/65/EU) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard Enterprise web site at: **http://www.hpe.com/info/recycle** These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell HPE equipment.

Summary of Changes

Date	Version History	Action	Description of Change
30-Nov-2023	Version 67	Changed	Overview and Service and Support sections were updated.
24-Jul-2023	Version 66	Changed	Overview, Standard Features, Service and Support and Configuration Information sections were updated
06-Mar-2023	Version 65	Changed	Overview and Standard Features sections were updated.
10-Jan-2023	Version 64	Changed	Added QuickSpecs for SGLX v15.00.00
21-Mar-2022	Version 63	Changed	Configuration Information section was updated
21-Feb-2022	Version 62	Changed	Overview and Configuration Information sections were updated
04-Oct-2021	Version 61	Changed	Overview, Standard Features, Service and Support, Configuration Information, and Technical Specifications sections were updated. Service and Support Pointnext Tech Care and Complete Care information added
02-Aug-2021	Version 60	Changed	Service and Support Pointnext information added
06-Apr-2021	Version 59	Changed	Overview, Standard Features, Service and Support, Configuration Information, and Technical Specifications sections were updated.
05-Oct-2020	Version 58	Changed	Overview, Standard Features, Service and Support, Configuration Information, and Technical Specifications sections were updated.
17-Feb-2019	Version 57	Changed	Overview and Standard Features sections were updated.
04-Nov-2019	Version 56	Changed	Overview, Standard Features, Service and Support, Configuration Information and Technical Specifications sections were updated.
02-Apr-2019	Version 55	Changed	QuickSpecs sections were updated.
04-Mar-2019	Version 54	Changed	Overview, Models, and Products Highlights sections were updated.
03-Dec-2018	Version 53	Changed	Standard Features and Models sections were updated.
04-Jun-2018	Version 52	Changed	Overview, Standard Features, and Product Highlights sections were updated.
04-Dec-2017	Version 51	Changed	Overview, Standard Features, Product Highlights, and Ordering and Configuration sections were updated.
		Added	SKUs were added in Ordering and Configuration section: U7H40E, U6HE0E, U7H52E, U2TZ7E, U7H64E, U2UC2E, U7H41E, U6HE1E, U7H53E, U2TZ8E, U7H65E, U2UC3E, U2UF1E, U7H43E, U6HE3E, U2UF5E, U7H55E, U2UA0E, U2UG1E, U7H67E, U2UC5E, U4QD8E, U4QD9E, U6HE7E, U4QE0E, U4QE1E, U4QE2E, U2UC9E, U2UF0E, U7H42E, U6HE2E, U7H54E, U2TZ9E, U7H66E, U2UC4E, U7H44E, U6HE4E, U7H56E, U2UA1E, U7H68E, U2UC6E, U7H45E, U6HE5E, U7H57E, U2UA2E, U7H69E, U2UC7E.
11-Jul-2017	Version 50	Changed	Overview and Product Highlights sections were updated.
05-Jun-2017	Version 49	Changed	Overview, Models, Product Highlights, and Ordering and Configuration section were updated.
05-Aug-2016	Version 48	Changed	Overview, Standard Features, Models, and Ordering and Configuration section were updated.
		Removed	SKUs deleted from Models and Ordering and Configuration sections: BB100ACN, BB084AA, BB084AC, BB084ACE, BB085AC, BB085ACE, BB100ACN, BB084AA, BB084AC, BB084ACE, BB085AC, BB085ACE.
06-Jun-2016	Version 47	Changed	Overview, Standard Features, Models, Products Highlights, Service and Support, and Ordering and Configuration sections were updated.
08-Apr-2016	Version 46	Changed	Overview, Product Highlights, and Technical Specifications sections were updated.
01-Dec-2015	Version 45	Changed	Multiple sections in QuickSpecs were updated.
28-Sep-2015	Version 44	Changed	Overview and Product High lights sections were updated.
17-Aug-2015	Version 43	Changed	Overview, Product High lights and Technical Specifications sections were updated.

Summary of Changes

Date	Version History	Action	Description of Change
29-Sep-2014	Version 42	Changed	Changes made throughout the Technical Specifications and Overview sections
		Added	SKUs added to Overview section: BB084ACE, BB085ACE
		Removed	SKUs removed form Services section: BB087ACE
07-Jul-2014	Version 41	Changed	Changes made throughout the entire QuickSpecs.
15-Apr-2014	Version 40	Changed	Formatting correction was made
18-Feb-2014	Version 39	Changed	Changes made throughout the QuickSpecs. Note that the title has changed
10-Dec-2013	Version 38	Changed	Changes made throughout the Technical Specifications section.
13-May-2013	Version 37	Changed	Changes made throughout the Overview and Technical Specifications sections.
04-Dec-2012	Version 36	Changed	Changes made throughout the Overview and Technical Specifications sections.
17-Aug-2012	Version 35	Changed	Changes made to the Overview and Technical Specifications sections.
27-Jul-2012	Version 34	Changed	Corrected an image formatting issue in the North America and Canada versions only.
06-Jul-2012	Version 33	Changed	Change made in the Overview information.
25-Jun-2012	Version 32	Changed	Changes made throughout the entire QuickSpecs. Note that the title has changed
27-Apr-2009	Version 31	Changed	Updated the Contributed Toolkit Suite throughout the Overview section and HPE StorageWorks MSA and EMC Symmetrix in Fibre Channel Storage in the Specifications section Completely revised Linux Distributions and Industry Standard Servers in the Specifications section HPE Serviceguard for Linux Oracle Database Toolkit was changed to A.05.00 in the Specifications section Removed Single-path and Multi-path SCSI Mass Storage in the Specifications section NOTE the title has changed
		Added	HPE ProLiant BL260c G5 Server Blade, BL2x220c G5 Server Blade and BL495 G5 Server Blade to HPE ProLiant BladeSystem c-Class, HPE ProLiant DL160 G5 and G5p, DL180 G5, DL185 G5, DL320 G5p and DL385 G5p to HPE ProLiant DL and HPE ProLiant ML310 G5 to HPE ProLiant ML in HPE ProLiant Servers in the Specifications section HPE Serviceguard for Linux - Flexible - Quantity License to HPE Serviceguard Linux A.11.19 High Availability Clustering Software in the Specifications section
22-Aug-2008	Version 30	Added	Note added.
14-Jul-2008	Version 29	Added	Supported Virtual Machines - SGLX in HPE Integrity Virtual Machines guests, SGLX in VMware ESX guests to the Introduction in the Overview section and SGLX in Red Hat and SUSE Xen hosts (DOMO) - supported Summer 2008 to the Introduction and What's new in the Overview section.
19-May-2008	Version 28	Changed	The QuickSpecs was completely rewritten. NOTE the title has changed.
11-Apr-2008	Version 27	Added	HPE ProLiant BL260c G5 Server Blade and HPE ProLiant DL180 G5 were added to Servers in the Specifications section.
31-Mar-2008	Version 26	Changed	Changes made throughout the entire QuickSpecs.
05-Sep-2007	Version 25	Added	Added the Environment-friendly Products and Approach object to the Technical Specifications section.
18-Jul-2007	Version 23	Changed	Changes made throughout the entire QuickSpecs.

Summary of Changes

Date	Version History	Action	Description of Change
11-Jul-2007	Version 22	Changed	Changes made to the What's New section and in the Specifications section.
09-Jul-2007	Version 21	Changed	Extensive changes made throughout the QuickSpecs.
14-Nov-2006	Version 20	Changed	Extensive changes made throughout the QuickSpecs.
17-Mar-2006	Version 19	Changed	Made changes to "Supported Options for HPE Serviceguard for Linux and Red Hat Global File System (T2398AA)" in the SPECIFICATIONS section.
		Added	Added "Cluster File System" to the SPECIFICATIONS section.
06-Feb-2006	Version 18	Changed	Changes made throughout the entire QuickSpecs.
22-Jul-2005	Version 17	Changed	Changes made within Models, Product High lights, and Specifications.
27-Jun-2005	Version 16	Changed	Changes made within What's New, HPE Serviceguard for Linux Capabilities, Specifications, Supported Models, and Related Options, and other minor formatting changes throughout.
		Added	HP Serviceguard Extension for SAP Linux LTU (T1227AA)" in Related Options Section.
14-Feb-2005	Version 15	Changed	Changes made within What's New and Models. Other changes made to Product High lights, HPE Serviceguard Manager Capabilities, Specifications, Supported and Related Options, and other minor formatting changes throughout.
		Added	"Supported Options for HPE Serviceguard for Linux" in Supported Models Section.
01-Nov-2004	Version 14	Changed	Changed Ordering Information to Models and revised. Other changes made to Supported Models, Related Options, and other minor formatting changes throughout.
06-Aug-2004	Version 13	Changed	Changes made throughout the Overview, Product High lights and Specifications sections
22-Jul-2004	Version 12	Changed	Changes made throughout the Overview, Product High lights and Specifications sections.
23-Apr-2004	Version 11	Changed	Changes were made throughout the Overview, Product High lights and Specifications sections. Serviceguard for Linux ProLiant Cluster part numbers were changed from B23 to B24.
25-Mar-2004	Version 10	Changed	Reversed each of the changes made throughout the Overview, Product High lights and Specifications sections on March 10th.
10-Mar-2004	Version 9	Changed	Changes made throughout the Overview, Product High lights and Specifications sections.
14-Dec-2003	Version 8	Changed	Changed "(January 2004)" to "(March 2004)" in what's new section
		Removed	"The Quorum Service is a separate product provided on the "Serviceguard Distributed Components" CD." and "The Quorum Service is required for a 2-node configuration and recommended for a 3- to 4-node configuration."
17-Nov-2003	Version 7	Changed	The content in this document was completely revised for this announcement.
06-Sep-2003	Version 6	Changed	The Document was placed into the new format
10-Jun-2003	Version 5	Changed	The content in this document was completely revised. Please note that the document has been placed in a new template as well.
16-Apr-2003	Version 4	Changed	Information updated.
11-Mar-2003	Version 3	Changed	What's New, Overview, and Configuration Information sections were updated.
30-Jan-2003	Version 2	Changed	Technical Specifications sections were updated.
19-Nov-2002	Version 1	Created	New QuickSpecs

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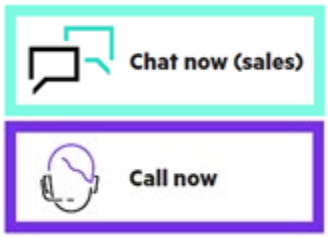

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