Overview

HP Serviceguard for Linux is high availability clustering software designed to protect applications and services from planned and unplanned downtime. Serviceguard for Linux ensures 24x7 application availability by packaging an application or service with its associated resources, and moving that package to other servers as needed. Packages can be moved automatically when Serviceguard detects a failure in a resource, or manually in order to perform system maintenance or upgrades. By monitoring the health of each server (node) within a cluster, Serviceguard for Linux quickly responds to failures such as those that affect processes, memory, LAN media and adapters, disk, operating environments, and more. Serviceguard for Linux also includes many out-of-the-box features that ensure scalability and allow intricate control over cluster configuration, and optimizes in-house expertise for businesses already running Serviceguard for HP-UX. Application Integration Toolkits are also available, and serve to quickly integrate complex applications into a Serviceguard for Linux cluster. The Application Integration Toolkit portfolio includes an Oracle Database Toolkit and Serviceguard Extension for SAP for Linux (SGeSAP/LX), as well as many others which are available at no charge. Cost-effective options for Disaster Tolerant Solutions are designed to fit any environment or budget, offering your choice of software mirroring or hardware data replication. A complete set of solutions backed by a worldwide network of support and services all work together to bring enterprise-class availability to the industry-standard, open source Linux enterprise.

The following is a quick summary of HP Serviceguard for Linux features and support. For the most recent list of Linux distributions & kernels, servers and storage supported with Serviceguard for Linux, please always refer to the Serviceguard for Linux Certification Matrix, available at: http://www.hp.com/go/sglx.

- Supported Linux Distributions:
  - Red Hat EL 5
  - SUSE SLES10
- Supported Server Platforms
  - HP Integrity
  - HP ProLiant
  - Many 3rd party x86 class servers
- Supported Virtual Machines
  - SGLX in HP Integrity Virtual Machines guests
  - SGLX in VMware ESX guests
  - SGLX in Red Hat and SUSE Xen hosts (DOM0)
- Application Integration Toolkits
  - Oracle Database Toolkit
  - Serviceguard Extension for SAP for Linux (SGeSAP/LX)
  - Contributed Application Integration Toolkits available from: http://www.hp.com/go/softwaredepot/ha at no charge:
  - The Contributed Toolkit Suite includes:
    - Apache
    - MySQL
    - NFS
    - PostgreSQL
    - Samba
    - Tomcat
    - Sendmail
    - Virtual Machine Toolkit (for use with VMware)
  - OCSF2 Support with SUSE Enterprise Linux
  - Support for Serviceguard running on a Xen DOM0 Host
- Disaster Tolerant Solutions
  - Serviceguard for Linux Extended Distance Cluster (XDC) extends cluster distances up to 100 km, utilizes software RAID mirroring for data replication and is storage array independent
  - HP StorageWorks XP/EVA Cluster Extension Software for Linux (CLX) works seamlessly with HP Serviceguard for Linux, HP StorageWorks Continuous Access, and HP Disk Arrays to automate failover and failback between sites
- Software updates are distributed by HP Services to customers with support contracts

Overview

- For additional information on HP Serviceguard for Linux, visit: http://www.hp.com/go/sglx.

What's New

- HP Serviceguard for Linux A.11.19 portfolio addresses the customer demand for enterprise-class support of Linux high availability environments while at the same time providing many ease-of-use features and a broader support base for the integration toolkits in both physical and virtual environment.
- Reduce costs and improve quality of service
  - Improves application availability through reduced planned downtime with the help of new online package configuration capabilities
  - Provides support for faster failover (as low as 5 seconds) thus providing greater levels of protection and availability for mission-critical applications
  - Provides more flexibility and less complexity in configuring and managing applications by removing the need for custom coding through the package dependency features
- Bring high availability to applications into your virtual Linux environment
  - Provides VM Application Monitoring feature enhancement to help monitor applications running on a Virtual Machine and automatically failover the application to a different VM host
- Enhancements to existing toolkits
  - Modular package support and ASM support for Oracle Database toolkit
  - SGeSAP/LX toolkit enhancements (SAP kernel 7.10 and IPv6 support)
- With Autopass integration in the SG/LX 11.19 launch, there is a new managed licensing mechanism available on the core SG/LX product. A license entitlement certificate will be delivered via physical shipment for the new product numbers on the core Serviceguard for Linux Product. It will contain information needed to redeem license files online. This new electronic redemption process will allow for better service and support tracking.

Models

How to order HP Serviceguard for Linux

1. Serviceguard for Linux products for HP ProLiant/x86 servers can be ordered using product numbers via either value or volume sales channels. The contents of these product numbers are identical and it is the discretion of the sales team as to which is selected.
2. All HP Serviceguard for Linux products for HP ProLiant/x86 servers includes One Year of 24 x 7 Software Technical Support and Updates. Please see the Support Information section of these QuickSpecs for more information.
3. HP Serviceguard for Linux products for HP Integrity servers do NOT include bundled Software Technical Support and Updates. HP highly recommends ordering support for high availability solutions to ensure optimum protection for business critical applications. Please see the Support Information section of these QuickSpecs for details.

HP Serviceguard for Linux A.11.19 High Availability Clustering Software

HP Serviceguard for Linux on HP Integrity/ProLiant and other x86 Servers - Physical Media Kit T8719AA
Value sales channels
NOTE: This kit contains media only.

HP Serviceguard for Linux - Flexible-Quantity License T8720AA
(for Integrity Servers)
Licensed per Processor Core
NOTE: This part number can be used to purchase multiple licenses with a single activation key. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s).

HP Serviceguard for Linux - Flexible-Quantity License T8721AA
(for HP ProLiant and other third-party x86 servers through value sales channels)

Overview

Licensed per Server
NOTE: This part number can be used to purchase multiple licenses with a single activation key. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.

HP Serviceguard for Linux on HP ProLiant and other third-party x86 Servers - Physical Media Kit 519353-B21
NOTE: This kit contains media only.

HP Serviceguard for Linux on HP ProLiant and other third-party x86 Servers Single-Server License 519354-B21
Licensed per Server
NOTE: This license allows Serviceguard for Linux to be installed on 1 server. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.

HP Serviceguard for Linux - Flexible-Quantity License 519355-B21
(for HP ProLiant and other third-party x86 servers)
Licensed per Server
NOTE: This part number can be used to purchase multiple licenses with a single activation key. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.

HP Serviceguard for Linux Oracle Database Toolkit A.05.00
NOTE: Simplifies integration of an Oracle database (non-RAC) into a Serviceguard for Linux cluster.
NOTE: Requires HP Serviceguard for Linux.

HP Serviceguard Linux Oracle Database Toolkit for HP ProLiant/x86 Servers 463833-B21
Licensed per cluster
NOTE: Includes media and One Year 24x7 Software Support & Updates.

HP Serviceguard Linux Oracle Database Toolkit for HP ProLiant/x86 Servers - value sales channels T8676AA
Licensed per cluster
NOTE: Includes media and One Year 24x7 Software Support & Updates.

HP Serviceguard Linux Oracle Database Toolkit for HP Integrity Servers T2376A
Licensed per cluster
NOTE: Includes media.

HP Serviceguard Extension for SAP on Linux (SGeSAP/LX) A.03.00
NOTE: Simplifies the integration of complex high availability SAP environments into a Serviceguard for Linux cluster. Provides clustering for the major SAP applications based on SAP kernel 4.6, 6.x and 7.0 and MAXDB or Oracle database technology. Monitored and clustered components include SAP Central Instances, SAP System Central Services, SAP ABAP dialog instances, database and Livecache. Integrates with SAP Replicated Enqueue technology for two-node clusters. Additional support for SAP kernel 7.10 and full ipv6 cluster enablement is available with this release.
NOTE: Requires HP Serviceguard for Linux.
NOTE: Serviceguard Extension for SAP on Linux (SGeSAP/LX) for HP Integrity Servers is volume priced and licensed per SAP Central Instance (System ID).

HP Serviceguard Extension for SAP on Linux for HP ProLiant/x86 Servers 463834-B21
Licensed per physical server
NOTE: Includes media and One Year 24x7 Software Support & Updates.

HP Serviceguard Extension for SAP on Linux (SGeSAP/LX) for HP ProLiant/x86 Servers - value sales channels T8677AA
Licensed per physical server
NOTE: Includes media and One Year 24x7 Software Support & Updates.

Overview

HP Serviceguard Extension for SAP on Linux (SGeSAP/LX) for HP Integrity Servers
Licensed per SAP System ID
NOTE: Includes media.

1st SAP SID in a single cluster	T2392AA #001
2nd and 3rd SAP SIDs in a single cluster Must be ordered with quantity one of Option 001.	T2392AA #003
4th and beyond SAP SIDs in a single cluster Must be ordered with quantity one of Option 001 and quantity two of Option 003.	T2392AA #999

HP Serviceguard for Linux Contributed Application Integration Toolkits
NOTE: Requires HP Serviceguard for Linux.
Available from: http://www.hp.com/go/softwaredepot/ha: No charge

The following toolkits are part of the Contributed Toolkit Suite

- Apache
- MySQL
- NFS
- PostgreSQL
- Samba
- Tomcat
- Sendmail
- Virtual Machine toolkit (for use with VMware)

The other toolkits that are available are:

- Red Hat/ SUSE Xen Host (DOM0) support
- OCFS2 Support with SUSE Enterprise Linux
- Support for Serviceguard running on a Xen DOM0 Host

HP Serviceguard Linux Extended Distance Cluster (XDC) A.01.01
NOTE: Provides disaster tolerance for business-critical data and applications, ensuring application availability in the event of a site outage or disaster. Employs host-based replication utilizing Linux multi-device (MD) driver. Supports any combination of Fibre Channel storage arrays supported with Serviceguard for Linux and distance between data centers of up to 100 kilometers.
NOTE: Requires HP Serviceguard for Linux.

HP Serviceguard Linux Extended Distance Cluster (XDC) for HP ProLiant/x86 Servers Licensed per physical server NOTE: Includes media and One Year 24x7 Software Support & Updates.	463835-B21
HP Serviceguard Linux Extended Distance Cluster (XDC) for HP ProLiant/x86 Servers - value sales channels Licensed per physical server NOTE: Includes media and One Year 24x7 Software Support & Updates.	T8678AA
HP Serviceguard Linux Extended Distance Cluster (XDC) for HP Integrity Servers, Licensed per physical server NOTE: Includes media.	T2808AA

HP StorageWorks Cluster Extension for Linux (CLX)
NOTE: Provides disaster tolerance for business-critical data and applications, ensuring application availability in the event of a site outage or disaster. Employs array-based replication and mirroring utilizing HP Continuous Access (required). Requires identical Fibre Channel storage array family in both datacenters; distance between data centers is defined by the selected storage array.
NOTE: Requires HP Serviceguard for Linux and HP Continuous Access.
NOTE: For details please refer to the Cluster Extension for Linux Quickspecs for XP and EVA Storage Arrays at: http://h18000.www1.hp.com/products/quickspecs/12728_div/12728_div.html and http://h18006.www1.hp.com/products/quickspecs/12456_div/12456_div.html respectively.

Overview

HP StorageWorks XP Cluster Extension Linux, Licensed per physical server	T1657A
HP StorageWorks EVA Cluster Extension Linux, Licensed per physical server	T4393A

Product Highlights

NOTE: For a brief, printer friendly data sheet that describes this product and informs you of the essential capabilities and specifications, please visit: http://h71028.www7.hp.com/ERC/downloads/4AA2-0298ENW.pdf

HP Serviceguard for Linux Benefits

Stay available

- robust detection of faults in hardware and software
- protects application access from local failures and full site outages
- ensures data integrity with advanced features that protect critical assets
- automatic restoration within seconds
- effortless deployment of applications into a cluster

Stay maintainable

- online rolling upgrades reduce planned downtime for maintenance and upgrades
- application integration toolkits quickly integrate complex applications into a high availability environment
- common code-base with Serviceguard for HP-UX leverages in-house expertise
- intuitive cluster management included at no charge
- full range of support and services for the entire solution deliver a single point of support and accountability

Stay flexible

- easily integrates with other management tools such as HP SIM and OpenView
- supports both major Linux distributions
- cluster nodes physical & virtual servers supported as cluster nodes
- HP Integrity, HP ProLiant and continuously expanding support for 3rd party x86
- multi-platform SAN support protects existing storage investments

Stay scalable

- emerging open-source standards used to ensure interoperability of cluster components
- out-of-the-box enterprise features grow with your business
- package dependencies & package balancing enable intricate control over cluster behaviour
- disaster tolerant portfolio to suit budget and availability requirements

HP Serviceguard for Linux Capabilities

Increase overall cluster availability with fault resilient ProLiant and Integrity servers

HP ProLiant and Integrity quality and innovations provide maximum redundancy and fault-resilience across processor, disk, memory, power, cooling and I/O subsystems. Configurations of HP Serviceguard for Linux are completely tested and qualified on HP servers across multiple applications.

Improved application environment failover with support of virtualization technologies

HP Serviceguard for Linux supports key virtual machine offerings on ProLiant and Integrity server platforms to ensure the utmost availability and flexibility for application environments.

Greater protection over typical failover cluster configurations

HP Serviceguard for Linux uses additional hardware paths and software techniques to keep the application running on the same node and failing over to a new node as a last resort.

Ensure data integrity by eliminating "split-brain syndrome"

Cluster arbitration is essential to ensure the highest level of availability and data integrity. HP offers two alternatives for this requirement, one of which is required for a 2-node configuration and recommended for 3- or 4-node configurations to cover multiple failures. One method is through cluster lock LUN,

	which utilizes a shared LUN to provide a tie-break (arbitration) mechanism in the event a failure causes a 50% split in the cluster. The other method is through a Quorum Service, which runs on a separate PC or server and can arbitrate up to 50 clusters/100 cluster nodes. A single Quorum Service can provide arbitration service to both Linux and HP-UX clusters. This is particularly valuable in split-site configurations, with the Quorum Service at a third site, to ensure a cluster can create quorum in the event of a site failure.
Perform online reconfigurations	Reconfigure cluster nodes and packages and optimize your cluster performance without taking down the cluster.
Rolling upgrades eliminate downtime for upgrades	Allows software and hardware upgrades while the cluster remains up and running.
Workload allocation maintains performance levels	Applications can be configured to fail over to multiple nodes to minimize impact on the surviving nodes.
Disaster protection through stretch clustering	HP Serviceguard Extended Distance Cluster for Linux (XDC) is an available option that provides application and data integrity through software mirroring for disaster tolerant distances of up to 100 km. For distances up to 500 km, HP StorageWorks Cluster Extension works seamlessly with Serviceguard for Linux, HP StorageWorks Continuous Access, and your XP or EVA storage system to automate fail-over and fail-back between sites during disasters or major site outages.
Accelerate your Linux capabilities ahead of the competition	With operational features almost exactly the same as HP Serviceguard for HP-UX, you can easily integrate Linux clusters with common components and IT knowledge. You can prepare now to take advantage of the cost and control benefits of Linux more quickly.
Protect your existing storage investment	Serviceguard for Linux supports the HP MSA, EVA, and XP and EMC families of storage environments, allowing cost-effective integration into your existing multi-OS SAN infrastructure.
Leverage open standards	Rather than developing proprietary solutions which limit customer choice, HP Serviceguard for Linux supports emerging open-source standards to ensure interoperability of cluster components. Select 3rd party servers and storage are fully certified for use in a Serviceguard for Linux cluster, preserving the value of selecting an open operating environment.
Full solution support	As solid as the cluster itself, HP is solely accountable to you for all aspects of the solution, eliminating wasted time determining accountability among suppliers.
Rigorous testing, qualification, and support	HP conducts extreme stress and destructive testing based on best practices and standards to ensure that Serviceguard for Linux clusters will maintain the highest levels of availability for your mission critical applications.
Maintain highest levels of quality service	HP offers a comprehensive portfolio of support services to meet any level of service agreement you require.

Product Highlights

Intuitive, graphical interface provides multi-OS support through a common console	HP Serviceguard Manager is a web-based, HP System Management Homepage (HP SMH) plug-in tool, which allows users to visually configure, monitor, manage and administer a cluster and its components (e.g. nodes, packages). Intuitive color-coded icons will help quickly identify problems with the cluster so users can quickly react and resolve issues. HP Serviceguard Manager is also integrated with HP System Insight Manager (HP SIM) to enable management of multiple clusters running on Linux or HP-UX from a single browser. For more details see the Serviceguard Manager Capabilities section of this document.
Application solutions available	• HP Serviceguard for Linux Oracle Database Toolkit for HP ProLiant and Integrity provides the necessary scripts for database failover to quickly integrate Oracle into a Serviceguard for Linux cluster. • HP Serviceguard Extension for SAP for Linux provides high availability for SAP environments through fast, automated hardware, operating system and network failure detection and application restoration, bringing HP's proven mission-critical software, support and services capabilities to Linux and HP ProLiant and Integrity servers backed by HP and SAP. • HP Serviceguard Extended Distance Cluster for Linux provides disaster-tolerant capabilities by stretching a Serviceguard for Linux cluster up to 100 km, providing protection against site failures and data corruption while utilizing open source components. • Popular application deployments are documented in white papers at: http://www.hp.com/go/sglx.
Toolkits for common applications speed deployment	Simple script templates for HP ProLiant and Integrity designed specifically for widely used applications like NFS, Samba, Apache, MySQL, PostgreSQL, Tomcat and SendMail are available at no extra charge from: http://www.hp.com/go/softwaredepot/ha. Customers can easily customize configurations based on preferred cluster parameters and quickly install applications. The Serviceguard Developer's Toolbox program enables ISVs to work with HP to create and validate application toolkits. Information on this program is available at: http://www.hp.com/go/dsppha. Additional applications can be supported through simple custom shell scripts developed in-house via scripting or through the configuration capability of Serviceguard Manager or through HP Consulting.
Unsurpassed control of infrastructure and business services at all levels	HP offers a set of integrated management solutions to manage networks, systems, and clusters at different levels. At the enterprise level, HP offers OpenView to manage a multi-vendor environment. At the multi-system level, System Insight Manager is used to manage HP servers, storage, clients, printers, and other networked devices. At the single system level, System Management Homepage is used to consolidate and simplify system management for HP servers running HP-UX, Linux, and Microsoft Windows operating systems. For cluster management, Serviceguard Manager is used to configure, administer, and monitor a Serviceguard cluster running on HP-UX or Linux.

Product Highlights

HP Serviceguard Manager Capabilities

HP Serviceguard Manager is a new web-based, HP System Management Homepage (HP SMH) plug-in application, that replaces the functionality of the earlier Serviceguard management tools. HP Serviceguard Manager allows you to monitor and administer a Serviceguard cluster from any system with a browser.

- Configuration capabilities
  - Cluster create/modify/delete
  - Package create/modify/delete
  - Operation Log (Progress messages) for configuration and administration operations
- Role-based access
  - Management of cluster and package access policies
  - Enable configuration and administration for non-root user
- Administration functions enable users to perform tasks including:
  - Run, halt, or move one or more packages (each of which is a logical group of applications and their resources)
  - Change node switching and package switching on one or more packages
- Easy-to-understand confirmation dialogues are provided to inform users about the consequences of administrative actions. Users are shown the specific Serviceguard command used and progress messages that track the ongoing administrative operation.
- Monitoring functions enable users to act on changing status:
  - Color-coded, graphically-intuitive icons visually present online status and configuration information for a cluster and its components (e.g. member nodes and packages)
- Property sheets provide detailed information about clusters, nodes and packages monitored
- Auto-Refresh provides automatic updates, including the property sheets, and can be enabled or disabled
- Manage cluster remotely from any system with a browser
- Comprehensive online help is available
- Ease of use minimizes training to remotely manage clusters from any system with a browser
- Ability to view consolidated cluster log (Syslog) and package logs.
- Integrated with HP System Insight Manager (HP SIM) to enable management of multiple clusters running on Linux and HP-UX from a single browser

Supported with:

- Serviceguard version A.11.17.01 or later
- Serviceguard OPS Edition A.11.17.01 or later
- Earlier versions of Serviceguard use Serviceguard Manager A.05.01 available at: http://www.hp.com.go/softwaredepot/ha
- Internet Explorer 6.0 or higher
- Mozilla 1.5 or higher

HP Serviceguard for Linux Supported Configurations

NOTE: This is a list of supported configurations at time of writing. Please refer to the Serviceguard for Linux Certification Matrix at http://www.hp.com/go/sglx for the most up-to-date list of supported configurations and important notes and caveats.

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. HP offers two alternatives for this requirement, one of which is required for a 2-node configuration and recommended for 3- or 4-node configurations to cover multiple failures.
- 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.
- Quorum Service: Runs on a separate PC or server and can arbitrate up to 150 clusters/300 cluster nodes. One Quorum Service provides arbitration service to Linux and HP-UX clusters. This is particularly valuable in split-site configurations, with the Quorum Service 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 in a Linux environment can manage up to 150 clusters and 300 nodes. The Quorum Service and clustered nodes may be on different subnets. You can create the Quorum Service to be a package, so it is highly available. The package must run outside the cluster that the quorum server serves.
- Run on any HP PC or server certified for SUSE or Red Hat EL 3 or above.
- Minimum memory requirements 128 MB
- Locks up to 16 MB of memory.
- Single quorum service for a maximum of 300 nodes; up to 150 heterogeneous clusters.

Cluster Types

- Active/Active
- Active/Standby
- Rotating Standby

Linux Distributions

- Red Hat Enterprise Linux 5 (includes AP) Kernel Versions
  - RHEL5 … 2.6.18-8.EL5
  - RHEL5 … 2.6.18-8.1.6.EL5
  - RHEL5 … 2.6.18-8.1.8.EL5
  - RHEL5 … 2.6.18-8.1.14.E15
  - RHEL5 … 2.6.18-8.1.15.E15
  - RHEL5 … 2.6.18-49.EL5
  - RHEL5.1 … 2.6.18-53.EL5
  - RHEL5.1 … 2.6.18-53.1.4.EL5
  - RHEL5.1 … 2.6.18-53.1.6.EL5
  - RHEL5.1 … 2.6.18-53.1.13.EL5
  - RHEL5.1 … 2.6.18-53.1.14.EL5
  - RHEL5.1 … 2.6.18-53.1.19.EL5
  - RHEL5.1 … 2.6.18-53.1.21.EL5
  - RHEL5.2 … 2.6.18-92.EL5
  - RHEL5.2 … 2.6.18-92.1.1.EL5
  - RHEL5.2 … 2.6.18-92.1.10.EL5
  - RHEL5.2 … 2.6.18-92.1.13.EL5

- RHEL4 U6 [ES/AS] … 2.6.9-78.EL
- RHEL4 U6 [ES/AS] … 2.6.9-78.0.1.EL

- Novell SUSE Linux Enterprise Server 10 Kernel Versions
  - SLES10 ... errata 2.6.16.21-0.8
  - SLES10 SP1 … errata 2.6.16.46
  - SLES10 SP1 … errata 2.6.16.46-0.12
  - SLES10 SP1 … errata 2.6.16.46-0.14
  - SLES10 SP1 … errata 2.6.16.53-0.8
  - SLES10 SP1 … errata 2.6.16.53-0.16
  - SLES10 SP1 … errata 2.6.16.54-0.2.3
  - SLES10 SP1 … errata 2.6.16.54-0.2.5
  - SLES10 SP1 … errata 2.6.16.54-0.2.8
  - SLES10 SP1 … errata 2.6.16.54-0.2.11
  - SLES10 SP2 … errata 2.6.16.60-0.21
  - SLES10 SP2 … errata 2.6.16.60-0.25
  - SLES10 SP2 … errata 2.6.16.60-0.27
  - SLES10 SP2 … errata 2.6.16.60-0.30

Hypervisors

- HP Integrity Virtual Machines
- VMware ESX

HP Integrity Servers

- HP Integrity BladeSystem c-Class
  - HP Integrity BL860c Server Blade
  - HP Integrity BL870c Server Blade
- HP Integrity Entry-Level Servers
  - HP Integrity rx1600, rx1600-2
  - HP Integrity rx1620, rx1620-2
  - HP Integrity rx2600, rx2620, rx2620-2
  - HP Integrity rx2660
  - HP Integrity rx3600
  - HP Integrity rx4640
  - HP Integrity rx5670
  - HP Integrity rx6600
- HP Integrity Midrange Servers
  - HP Integrity rx7620
  - HP Integrity rx7640
  - HP Integrity rx8620
  - HP Integrity rx8640
- HP Integrity High-End Servers
  - Superdome

Specifications

HP ProLiant Servers

- HP ProLiant BladeSystem p-Class
  - HP ProLiant BL20p, BL20p G2, BL20p G3, BL20p G4 Server Blades
  - HP ProLiant BL25p, BL25p G2 Server Blades
  - HP ProLiant BL40p Server Blade
  - HP ProLiant BL45p, BL45p G2 Server Blades
- HP ProLiant BladeSystem c-Class
  - HP ProLiant BL260c G5 Server Blades
  - HP ProLiant BL2x220c G5 Server Blades
  - HP ProLiant BL460c Server Blades
  - HP ProLiant BL465c, BL465 G5 Server Blades
  - HP ProLiant BL480c Server Blades
  - HP ProLiant BL495c G5 Server Blade
  - HP ProLiant BL680c G5 Server Blade
  - HP ProLiant BL685c, BL685c G5 Server Blades
- HP ProLiant DL
  - HP ProLiant DL160 G5, DL160 G5p
  - HP ProLiant DL165 G5
  - HP ProLiant DL180 G5
  - HP ProLiant DL185 G5
  - HP ProLiant DL320 G5, DL320 G5p
  - HP ProLiant DL320s
  - HP ProLiant DL360, DL360 G2, DL360 G3, DL360 G4, DL360 G4p, DL360 G5
  - HP ProLiant DL365, DL365 G5
  - HP ProLiant DL380, DL380 G2, DL380 G3, DL380 G4, DL380 G5
  - HP ProLiant DL385, DL385 G2, DL385 G5, DL385 G5p
  - HP ProLiant DL560
  - HP ProLiant DL580, DL580 G2, DL580 G3, DL580 G4, DL580 G5
  - HP ProLiant DL585, DL585 G2, DL585 G5
  - HP ProLiant DL740
  - HP ProLiant DL760, DL760 G2
  - HP ProLiant DL785 G5
- HP ProLiant ML
  - HP ProLiant ML310 G5
  - HP ProLiant ML350 G3, ML350 G4p, ML350 G5
  - HP ProLiant ML370 G3, ML370 G4, ML370 G5
  - HP ProLiant ML570 G3, ML570 G4

Specifications

Industry Standard Servers

- IBM System x
  - eServer 325
  - xSeries 346
  - x3250 M2, x3350, x3450, x3650T
  - x3455, x3550
  - x3650, x3655
  - x3755, x3800
  - x3850, x3850 M2, x3950, x3950 M2
- IBM BladeCenter
  - HS12, HS21, HS21 Extended Memory
  - LS21, LS22, LS41, LS42
- Dell PowerEdge
  - R200, R300, R805, R900, R905
  - SC1435
  - M600, M605
  - 1900, 1950, 2850, 2900, 2950, 2970, 6950
- Fujitsu Siemens PRIMERGY
  - RX200 S4, RX300 S4
  - RX330 S1, RX600 S4
  - BX600 S3, BX630 S2
- Sun x64 Sunfire Servers
  - X4100, X4100 M2, X4150
  - X4200, X4200 M2
  - X4450
  - X4140, X4240, X4440, X4540, X4500, X4600 M2
  - X2100 M2, X2200 M2

Fibre Channel Storage Up to 16 nodes

- HP StorageWorks MSA
  - MSA2000fc
- HP StorageWorks EVA
  - EVA 3000 / 5000
  - EVA 4x00 / 6x00 / 8x00
- HP StorageWorks XP
  - XP48
  - XP128
  - XP512
  - XP1024
  - XP10000, XP12000
  - XP20000, XP24000
- EMC Symmetrix
  - Symmetrix 8000-Series: 5, 5.5
  - Symmetrix DMX: 6, 6.5, 7.0
- EMC CLARiiON
  - CLARiiON CX/AX

Fibre Channel switches

Switches and hubs supported on selected disk array

NOTE: Please contact your HP Storage representative for the latest firmware revision for switch connectivity support on Linux.

Specifications

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

Support Information

NOTE: HP offers a number of software support services, many of which are provided to our customers at no additional charge. HP Worldwide Customer Service contact numbers are available at: http://www.hp.com/country/us/en/wwcontact.html. For U.S. customers, indicate "Serviceguard Linux" when prompted for the product name.

- Support for HP ProLiant and Supported 3rd Party x86 Class Servers: Serviceguard for Linux software products for HP ProLiant and 3rd party x86 class servers include one year of 24 x 7 HP Software Technical Support and Update Service with Care Pack uplifts to 3 years of coverage available. This service provides access to HP technical resources for assistance in resolving software implementation or operations problems. The service also provides access to software updates and reference manuals either in electronic form or on physical media as they are made available from HP. With this service, Serviceguard for Linux customers will benefit from expedited problem resolution as well as proactive notification and delivery of software updates. For more information about this service, see: http://www.hp.com/services/swsupport. To initiate support, Customers may need to contact HP to register their product.
  - If the subscription was purchased through an HP channel partner, Customers must contact HP to activate support using the following URL: http://www.hp.com/go/sglx-reg. HP recommends that Customers contact HP immediately to register their product so there is no delay in receiving software technical support.
  - If the subscription was purchased directly from HP, support has already been activated and no action is required. Once registered for this service, Customers will receive a letter in the mail containing the Customer Service Phone number for their reference and their Service Agreement Identifier (SAID). After receiving the SAID, Customers can go to the Software Update Manager (SUM) web page to view their contract online and select electronic delivery for their updates.
- Support for HP Integrity Servers: Serviceguard for Linux software products for HP Integrity servers do NOT include bundled support. HP highly recommends that Customers order support for any high availability configurations in order to provide the utmost protection for business critical applications and services.
- Warranty: HP 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.

HP Serviceguard Linux A.11.19 High Availability Clustering Software		
HP Serviceguard for Linux on HP ProLiant and other third-party x86 Servers Single-Server License		519354-B21
HP Serviceguard for Linux - Flexible-Quantity License (for HP ProLiant and other third-party x86 servers)		519355-B21
Flexible Upfront 24x7 Software Support & Updates	HP CP 1Y 24x7 SW Support	included
	HP CP 3Y 24x7 SW Support	HA107A3#9E0
	HP CP 4Y 24x7 SW Support	HA107A4#9E0
	HP CP 5Y 24x7 SW Support	HA107A5#9E0
Flexible Upfront Support Plus 24	HP CP 1Y Support Plus 24	included
	HP CP 3Y Support Plus 24	HA110A3#9E0
	HP CP 4Y Support Plus 24	HA110A4#9E0
	HP CP 5Y Support Plus 24	HA110A5#9E0

Specifications

Flexible Upfront Proactive 24	HP CP 1Y Proactive 24	included
	HP CP 3Y Proactive 24	HA111A3#9E0
	HP CP 4Y Proactive 24	HA111A4#9E0
	HP CP 5Y Proactive 24	HA111A5#9E0
Flexible Upfront Critical Service	HP CP 1Y Critical Service	included
	HP CP 3Y Critical Service	HA112A3#9E0
	HP CP 4Y Critical Service	HA112A4#9E0
	HP CP 5Y Critical Service	HA112A5#9E0
Fixed Upfront 24x7 Software Support & Updates	HP Fixed Upfront 3Y 24x7 SW Support NOTE: HP 3y 24x7 Serviceguard Fixed Upfront SW Support is only available for HP Serviceguard Linux products for HP ProLiant and supported 3rd party x86 servers sold through volume sales channels.	UJ742E
HP Serviceguard for Linux - Flexible-Quantity License (for HP ProLiant and other third-party x86 servers through value sales channels)		T8721AA
Flexible Upfront 24x7 Software Support & Updates	HP CP 1Y 24x7 SW Support	included
	HP CP 3Y 24x7 SW Support	HA107A3#9DW
	HP CP 4Y 24x7 SW Support	HA107A4#9DW
	HP CP 5Y 24x7 SW Support	HA107A5#9DW
Flexible Upfront Support Plus 24	HP CP 1Y Support Plus 24	included
	HP CP 3Y Support Plus 24	HA110A3#9DW
	HP CP 4Y Support Plus 24	HA110A4#9DW
	HP CP 5Y Support Plus 24	HA110A5#9DW
Flexible Upfront Proactive 24	HP CP 1Y Proactive 24	included
	HP CP 3Y Proactive 24	HA111A3#9DW
	HP CP 4Y Proactive 24	HA111A4#9DW
	HP CP 5Y Proactive 24	HA111A5#9DW
Flexible Upfront Critical Service	HP CP 1Y Critical Service	included
	HP CP 3Y Critical Service	HA112A3#9DW
	HP CP 4Y Critical Service	HA112A4#9DW
	HP CP 5Y Critical Service	HA112A5#9DW
HP Serviceguard for Linux - Flexible-Quantity License (for Integrity Servers)		T8720AA#2AH
Flexible Upfront Software Updates	HP CP 1Y SW Updates	HA108A1#6A4
	HP CP 3Y SW Updates	HA108A3#6A4
	HP CP 4Y SW Updates	HA108A4#6A4
	HP CP 5Y SW Updates	HA108A5#6A4
Flexible Upfront 24x7 Software Support & Updates	HP CP 1Y 24x7 SW Support	HA107A1#6A4
	HP CP 3Y 24x7 SW Support	HA107A3#6A4
	HP CP 4Y 24x7 SW Support	HA107A4#6A4
	HP CP 5Y 24x7 SW Support	HA107A5#6A4
Flexible Upfront Support Plus	HP CP 1Y Support Plus	HA110A1#6A4
	HP CP 3Y Support Plus	HA110A3#6A4
	HP CP 4Y Support Plus	HA110A4#6A4
	HP CP 5Y Support Plus	HA110A5#6A4
Flexible Upfront Support Plus 24	HP CP 1Y Support Plus	HA110A1#6A4
	HP CP 3Y Support Plus 24	HA110A3#6A4
	HP CP 4Y Support Plus 24	HA110A4#6A4
	HP CP 5Y Support Plus 24	HA110A5#6A4

Specifications

Flexible Upfront Proactive 24	HP CP 1Y Proactive 24	HA111A1#6A4
	HP CP 3Y Proactive 24	HA111A3#6A4
	HP CP 4Y Proactive 24	HA111A4#6A4
	HP CP 5Y Proactive 24	HA111A5#6A4
Flexible Upfront Critical Service	HP CP 1Y Critical Service	HA112A1#6A4
	HP CP 3Y Critical Service	HA112A3#6A4
	HP CP 4Y Critical Service	HA112A4#6A4
	HP CP 5Y Critical Service	HA112A5#6A4

HP Serviceguard for Linux Oracle Database Toolkit A.05.00		
Serviceguard Linux Oracle Database Toolkit for HP ProLiant/x86 Servers - volume sales channels		463833-B21
Flexible Upfront 24x7 Software Support & Updates	HP CP 1Y 24x7 SW Support	included
	HP CP 3Y 24x7 SW Support	HA107A3#9E1
	HP CP 4Y 24x7 SW Support	HA107A4#9E1
	HP CP 5Y 24x7 SW Support	HA107A5#9E1
Flexible Upfront Support Plus 24	HP CP 1Y Support Plus 24	included
	HP CP 3Y Support Plus 24	HA110A3#9E1
	HP CP 4Y Support Plus 24	HA110A4#9E1
	HP CP 5Y Support Plus 24	HA110A5#9E1
Flexible Upfront Proactive 24	HP CP 1Y Proactive 24	included
	HP CP 3Y Proactive 24	HA111A3#9E1
	HP CP 4Y Proactive 24	HA111A4#9E1
	HP CP 5Y Proactive 24	HA111A5#9E1
Flexible Upfront Critical Service	HP CP 1Y Critical Service	included
	HP CP 3Y Critical Service	HA112A3#9E1
	HP CP 4Y Critical Service	HA112A4#9E1
	HP CP 5Y Critical Service	HA112A5#9E1
Fixed Upfront 24x7 Software Support & Updates	HP Fixed Upfront 3Y 24x7 SW Support NOTE: HP 3y 24x7 Serviceguard Fixed Upfront SW Support is only available for HP Serviceguard Linux products for HP ProLiant and supported 3rd party x86 servers sold through volume sales channels.	UJ743E
Serviceguard Linux Oracle Database Toolkit for HP ProLiant/x86 Servers - value sales channels		T8676AA
Flexible Upfront 24x7 Software Support & Updates	HP CP 1Y 24x7 SW Support	included
	HP CP 3Y 24x7 SW Support	HA107A3#9DX
	HP CP 4Y 24x7 SW Support	HA107A4#9DX
	HP CP 5Y 24x7 SW Support	HA107A5#9DX
Flexible Upfront Support Plus 24	HP CP 1Y Support Plus 24	included
	HP CP 3Y Support Plus 24	HA110A3#9DX
	HP CP 4Y Support Plus 24	HA110A4#9DX
	HP CP 5Y Support Plus 24	HA110A5#9DX
Flexible Upfront Proactive 24	HP CP 1Y Proactive 24	included
	HP CP 3Y Proactive 24	HA111A3#9DX
	HP CP 4Y Proactive 24	HA111A4#9DX
	HP CP 5Y Proactive 24	HA111A5#9DX

Specifications

Flexible Upfront Critical Service	HP CP 1Y Critical Service	included
	HP CP 3Y Critical Service	HA112A3#9DX
	HP CP 4Y Critical Service	HA112A4#9DX
	HP CP 5Y Critical Service	HA112A5#9DX
Serviceguard Linux Oracle Database Toolkit for HP Integrity Servers		T2376A
Flexible Upfront Software Updates	HP CP 1Y SW Updates	HA108A1#6A2
	HP CP 3Y SW Updates	HA108A3#6A2
	HP CP 4Y SW Updates	HA108A4#6A2
	HP CP 5Y SW Updates	HA108A5#6A2
Flexible Upfront 24x7 Software Support & Updates	HP CP 1Y 24x7 SW Support	HA107A1#6A2
	HP CP 3Y 24x7 SW Support	HA107A3#6A2
	HP CP 4Y 24x7 SW Support	HA107A4#6A2
	HP CP 5Y 24x7 SW Support	HA107A5#6A2
Flexible Upfront Support Plus	HP CP 1Y Support Plus	HA110A1#6A2
	HP CP 3Y Support Plus	HA110A3#6A2
	HP CP 4Y Support Plus	HA110A4#6A2
	HP CP 5Y Support Plus	HA110A5#6A2
Flexible Upfront Support Plus 24	HP CP 1Y Support Plus	HA110A1#6A2
	HP CP 3Y Support Plus 24	HA110A3#6A2
	HP CP 4Y Support Plus 24	HA110A4#6A2
	HP CP 5Y Support Plus 24	HA110A5#6A2
Flexible Upfront Proactive 24	HP CP 1Y Proactive 24	HA111A1#6A2
	HP CP 3Y Proactive 24	HA111A3#6A2
	HP CP 4Y Proactive 24	HA111A4#6A2
	HP CP 5Y Proactive 24	HA111A5#6A2
Flexible Upfront Critical Service	HP CP 1Y Critical Service	HA112A1#6A2
	HP CP 3Y Critical Service	HA112A3#6A2
	HP CP 4Y Critical Service	HA112A4#6A2
	HP CP 5Y Critical Service	HA112A5#6A2

HP Serviceguard Extension for SAP on Linux (SGeSAP/LX)		
Serviceguard Extension for SAP on Linux (SGeSAP/LX) for HP ProLiant/x86 Servers - volume sales channels		463834-B21
Flexible Upfront 24x7 Software Support & Updates	HP CP 1Y 24x7 SW Support	included
	HP CP 3Y 24x7 SW Support	HA107A3#9E2
	HP CP 4Y 24x7 SW Support	HA107A4#9E2
	HP CP 5Y 24x7 SW Support	HA107A5#9E2
Flexible Upfront Support Plus 24	HP CP 1Y Support Plus 24	included
	HP CP 3Y Support Plus 24	HA110A3#9E2
	HP CP 4Y Support Plus 24	HA110A4#9E2
	HP CP 5Y Support Plus 24	HA110A5#9E2
Flexible Upfront Proactive 24	HP CP 1Y Proactive 24	included
	HP CP 3Y Proactive 24	HA111A3#9E2
	HP CP 4Y Proactive 24	HA111A4#9E2
	HP CP 5Y Proactive 24	HA111A5#9E2

Specifications

Flexible Upfront Critical Service	HP CP 1Y Critical Service	included
	HP CP 3Y Critical Service	HA112A3#9E2
	HP CP 4Y Critical Service	HA112A4#9E2
	HP CP 5Y Critical Service	HA112A5#9E2
Fixed Upfront 24x7 Software Support & Updates	HP Fixed Upfront 3Y 24x7 SW Support NOTE: HP 3y 24x7 Serviceguard Fixed Upfront SW Support is only available for HP Serviceguard Linux products for HP ProLiant and supported 3rd party x86 servers sold through volume sales channels.	UJ744E
Serviceguard Extension for SAP on Linux (SGeSAP/LX) for HP ProLiant/x86 Servers - value sales channels		T8677AA
Flexible Upfront 24x7 Software Support & Updates	HP CP 1Y 24x7 SW Support	included
	HP CP 3Y 24x7 SW Support	HA107A3#9DY
	HP CP 4Y 24x7 SW Support	HA107A4#9DY
	HP CP 5Y 24x7 SW Support	HA107A5#9DY
Flexible Upfront Support Plus 24	HP CP 1Y Support Plus 24	included
	HP CP 3Y Support Plus 24	HA110A3#9DY
	HP CP 4Y Support Plus 24	HA110A4#9DY
	HP CP 5Y Support Plus 24	HA110A5#9DY
Flexible Upfront Proactive 24	HP CP 1Y Proactive 24	included
	HP CP 3Y Proactive 24	HA111A3#9DY
	HP CP 4Y Proactive 24	HA111A4#9DY
	HP CP 5Y Proactive 24	HA111A5#9DY
Flexible Upfront Critical Service	HP CP 1Y Critical Service	included
	HP CP 3Y Critical Service	HA112A3#9DY
	HP CP 4Y Critical Service	HA112A4#9DY
	HP CP 5Y Critical Service	HA112A5#9DY
Serviceguard Extension for SAP on Linux (SGeSAP/LX) for HP Integrity Servers - 1st SAP SID		T2392AA#001
Flexible Upfront Software Updates	HP CP 1Y SW Updates	HA108A1#67M
	HP CP 3Y SW Updates	HA108A3#67M
	HP CP 4Y SW Updates	HA108A4#67M
	HP CP 5Y SW Updates	HA108A5#67M
Flexible Upfront 24x7 Software Support & Updates	HP CP 1Y 24x7 SW Support	HA107A1#67M
	HP CP 3Y 24x7 SW Support	HA107A3#67M
	HP CP 4Y 24x7 SW Support	HA107A4#67M
	HP CP 5Y 24x7 SW Support	HA107A5#67M
Flexible Upfront Support Plus	HP CP 1Y Support Plus	HA110A1#67M
	HP CP 3Y Support Plus	HA110A3#67M
	HP CP 4Y Support Plus	HA110A4#67M
	HP CP 5Y Support Plus	HA110A5#67M
Flexible Upfront Support Plus 24	HP CP 1Y Support Plus	HA110A1#67M
	HP CP 3Y Support Plus 24	HA110A3#67M
	HP CP 4Y Support Plus 24	HA110A4#67M
	HP CP 5Y Support Plus 24	HA110A5#67M
Flexible Upfront Proactive 24	HP CP 1Y Proactive 24	HA111A1#67M
	HP CP 3Y Proactive 24	HA111A3#67M
	HP CP 4Y Proactive 24	HA111A4#67M
	HP CP 5Y Proactive 24	HA111A5#67M

Specifications

Flexible Upfront Critical Service	HP CP 1Y Critical Service	HA112A1#67M
	HP CP 3Y Critical Service	HA112A3#67M
	HP CP 4Y Critical Service	HA112A4#67M
	HP CP 5Y Critical Service	HA112A5#67M
Serviceguard Extension for SAP on Linux (SGeSAP/LX) for HP Integrity Servers - 2nd and 3rd SAP SIDs		T2392AA#003
Flexible Upfront Software Updates	HP CP 1Y SW Updates	HA108A1#67Q
	HP CP 3Y SW Updates	HA108A3#67Q
	HP CP 4Y SW Updates	HA108A4#67Q
	HP CP 5Y SW Updates	HA108A5#67Q
Flexible Upfront 24x7 Software Support & Updates	HP CP 1Y 24x7 SW Support	HA107A1#67Q
	HP CP 3Y 24x7 SW Support	HA107A3#67Q
	HP CP 4Y 24x7 SW Support	HA107A4#67Q
	HP CP 5Y 24x7 SW Support	HA107A5#67Q
Flexible Upfront Support Plus	HP CP 1Y Support Plus	HA110A1#67Q
	HP CP 3Y Support Plus	HA110A3#67Q
	HP CP 4Y Support Plus	HA110A4#67Q
	HP CP 5Y Support Plus	HA110A5#67Q
Flexible Upfront Support Plus 24	HP CP 1Y Support Plus	HA110A1#67Q
	HP CP 3Y Support Plus 24	HA110A3#67Q
	HP CP 4Y Support Plus 24	HA110A4#67Q
	HP CP 5Y Support Plus 24	HA110A5#67Q
Flexible Upfront Proactive 24	HP CP 1Y Proactive 24	HA111A1#67Q
	HP CP 3Y Proactive 24	HA111A3#67Q
	HP CP 4Y Proactive 24	HA111A4#67Q
	HP CP 5Y Proactive 24	HA111A5#67Q
Flexible Upfront Critical Service	HP CP 1Y Critical Service	HA112A1#67Q
	HP CP 3Y Critical Service	HA112A3#67Q
	HP CP 4Y Critical Service	HA112A4#67Q
	HP CP 5Y Critical Service	HA112A5#67Q
Serviceguard Extension for SAP on Linux (SGeSAP/LX) for HP Integrity Servers - 4th and beyond SAP SIDs		T2392AA#999
Flexible Upfront Software Updates	HP CP 1Y SW Updates	HA108A1#67R
	HP CP 3Y SW Updates	HA108A3#67R
	HP CP 4Y SW Updates	HA108A4#67R
	HP CP 5Y SW Updates	HA108A5#67R
Flexible Upfront 24x7 Software Support & Updates	HP CP 1Y 24x7 SW Support	HA107A1#67R
	HP CP 3Y 24x7 SW Support	HA107A3#67R
	HP CP 4Y 24x7 SW Support	HA107A4#67R
	HP CP 5Y 24x7 SW Support	HA107A5#67R
Flexible Upfront Support Plus	HP CP 1Y Support Plus	HA110A1#67R
	HP CP 3Y Support Plus	HA110A3#67R
	HP CP 4Y Support Plus	HA110A4#67R
	HP CP 5Y Support Plus	HA110A5#67R
Flexible Upfront Support Plus 24	HP CP 1Y Support Plus	HA110A1#67R
	HP CP 3Y Support Plus 24	HA110A3#67R
	HP CP 4Y Support Plus 24	HA110A4#67R
	HP CP 5Y Support Plus 24	HA110A5#67R

Specifications

Flexible Upfront Proactive 24	HP CP 1Y Proactive 24	HA111A1#67R
	HP CP 3Y Proactive 24	HA111A3#67R
	HP CP 4Y Proactive 24	HA111A4#67R
	HP CP 5Y Proactive 24	HA111A5#67R
Flexible Upfront Critical Service	HP CP 1Y Critical Service	HA112A1#67R
	HP CP 3Y Critical Service	HA112A3#67R
	HP CP 4Y Critical Service	HA112A4#67R
	HP CP 5Y Critical Service	HA112A5#67R

HP Serviceguard for Linux Extended Distance Cluster (XDC)		
Serviceguard Linux Extended Distance Cluster (XDC) for HP ProLiant/x86 Servers - volume sales channels		463835-B21
Flexible Upfront 24x7 Software Support & Updates	HP CP 1Y 24x7 SW Support	included
	HP CP 3Y 24x7 SW Support	HA107A3#6Z9
	HP CP 4Y 24x7 SW Support	HA107A4#6Z9
	HP CP 5Y 24x7 SW Support	HA107A5#6Z9
Flexible Upfront Support Plus 24	HP CP 1Y Support Plus 24	included
	HP CP 3Y Support Plus 24	HA110A3#6Z9
	HP CP 4Y Support Plus 24	HA110A4#6Z9
	HP CP 5Y Support Plus 24	HA110A5#6Z9
Flexible Upfront Proactive 24	HP CP 1Y Proactive 24	included
	HP CP 3Y Proactive 24	HA111A3#6Z9
	HP CP 4Y Proactive 24	HA111A4#6Z9
	HP CP 5Y Proactive 24	HA111A5#6Z9
Flexible Upfront Critical Service	HP CP 1Y Critical Service	included
	HP CP 3Y Critical Service	HA112A3#6Z9
	HP CP 4Y Critical Service	HA112A4#6Z9
	HP CP 5Y Critical Service	HA112A5#6Z9
Fixed Upfront 24x7 Software Support & Updates	HP Fixed Upfront 3Y 24x7 SW Support NOTE: HP 3y 24x7 Serviceguard Fixed Upfront SW Support is only available for HP Serviceguard Linux products for HP ProLiant and supported 3rd party x86 servers sold through volume sales channels.	UJ745E
Serviceguard Linux Extended Distance Cluster (XDC) for HP ProLiant/x86 Servers - value sales channels		T8678AA
Flexible Upfront 24x7 Software Support & Updates	HP CP 1Y 24x7 SW Support	included
	HP CP 3Y 24x7 SW Support	HA107A3#9DZ
	HP CP 4Y 24x7 SW Support	HA107A4#9DZ
	HP CP 5Y 24x7 SW Support	HA107A5#9DZ
Flexible Upfront Support Plus 24	HP CP 1Y Support Plus 24	included
	HP CP 3Y Support Plus 24	HA110A3#9DZ
	HP CP 4Y Support Plus 24	HA110A4#9DZ
	HP CP 5Y Support Plus 24	HA110A5#9DZ
Flexible Upfront Proactive 24	HP CP 1Y Proactive 24	included
	HP CP 3Y Proactive 24	HA111A3#9DZ
	HP CP 4Y Proactive 24	HA111A4#9DZ
	HP CP 5Y Proactive 24	HA111A5#9DZ

Specifications

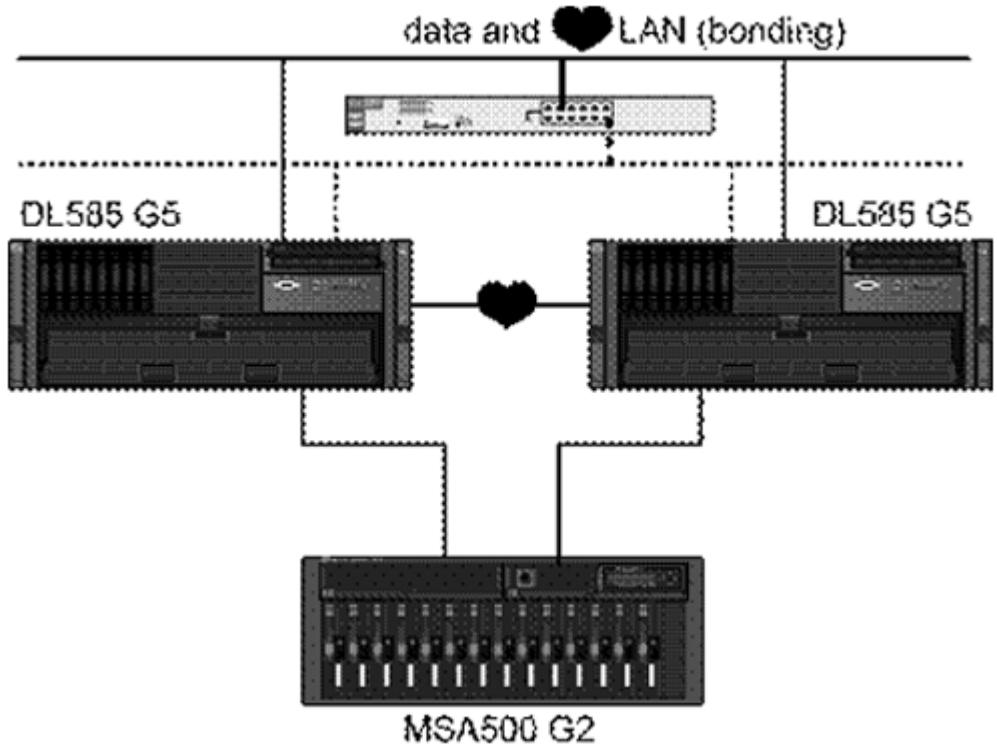
Flexible Upfront Critical Service	HP CP 1Y Critical Service	included
	HP CP 3Y Critical Service	HA112A3#9DZ
	HP CP 4Y Critical Service	HA112A4#9DZ
	HP CP 5Y Critical Service	HA112A5#9DZ
Serviceguard Linux Extended Distance Cluster (XDC) for HP Integrity Servers		T8678AA
Flexible Upfront Software Updates	HP CP 1Y SW Updates	HA108A1#6A8
	HP CP 3Y SW Updates	HA108A3#6A8
	HP CP 4Y SW Updates	HA108A4#6A8
	HP CP 5Y SW Updates	HA108A5#6A8
Flexible Upfront 24x7 Software Support & Updates	HP CP 1Y 24x7 SW Support	HA107A1#6A8
	HP CP 3Y 24x7 SW Support	HA107A3#6A8
	HP CP 4Y 24x7 SW Support	HA107A4#6A8
	HP CP 5Y 24x7 SW Support	HA107A5#6A8
Flexible Upfront Support Plus	HP CP 1Y Support Plus	HA110A1#6A8
	HP CP 3Y Support Plus	HA110A3#6A8
	HP CP 4Y Support Plus	HA110A4#6A8
	HP CP 5Y Support Plus	HA110A5#6A8
Flexible Upfront Support Plus 24	HP CP 1Y Support Plus	HA110A1#6A8
	HP CP 3Y Support Plus 24	HA110A3#6A8
	HP CP 4Y Support Plus 24	HA110A4#6A8
	HP CP 5Y Support Plus 24	HA110A5#6A8
Flexible Upfront Proactive 24	HP CP 1Y Proactive 24	HA111A1#6A8
	HP CP 3Y Proactive 24	HA111A3#6A8
	HP CP 4Y Proactive 24	HA111A4#6A8
	HP CP 5Y Proactive 24	HA111A5#6A8
Flexible Upfront Critical Service	HP CP 1Y Critical Service	HA112A1#6A8
	HP CP 3Y Critical Service	HA112A3#6A8
	HP CP 4Y Critical Service	HA112A4#6A8
	HP CP 5Y Critical Service	HA112A5#6A8

Cluster Topologies

SCSI configuration topology

- Use the HP ProLiant configuration tools to find the appropriate part numbers.
- A hub or switch is necessary to connect the two client LANs. The customer must then connect the client LANs to the remainder of their network infrastructure.
- What is critical is the number of LAN connections and the SCSI connection to the MSA500 G2 Storage. There needs to be a minimum of two LAN connections per server configured in a bond and used for both heartbeat and data, whereas the recommended configuration includes three LAN connections per server (one heartbeat and two public) with bonding and one SCSI adapter connection to the Modular Smart Array 500 G2. Integrated LANs may be used when possible.
- When using multiple paths to storage, Cluster Lock LUN is not supported and the use of a quorum service is required.

Figure 1: HP's recommended cluster configuration for SCSI in a switch attach configuration.



Fibre Channel configuration topology

- Up to 16 nodes are supported in a Fibre Channel configuration
- A quorum service or cluster lock LUN is only required for 2-node configurations, it is optional for 3- to 16-node configurations.
- LAN connection to switches, white papers are available on the Procurve section of the HP Web site (http://www.hp.com/rnd/index.htm), 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 direct attach and switch attach configurations, 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 the MSA2000FC documentation for complete connectivity details.

Figure 2: HP's recommended cluster configuration for Fibre Channel using a dual-controller Fibre Channel system in a direct attach configuration.

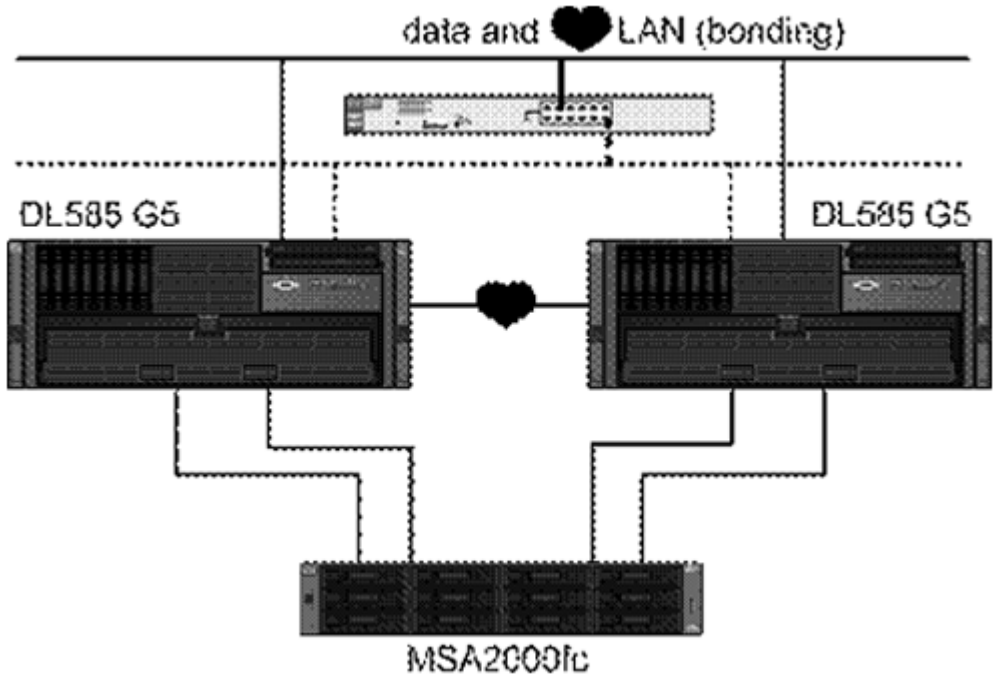
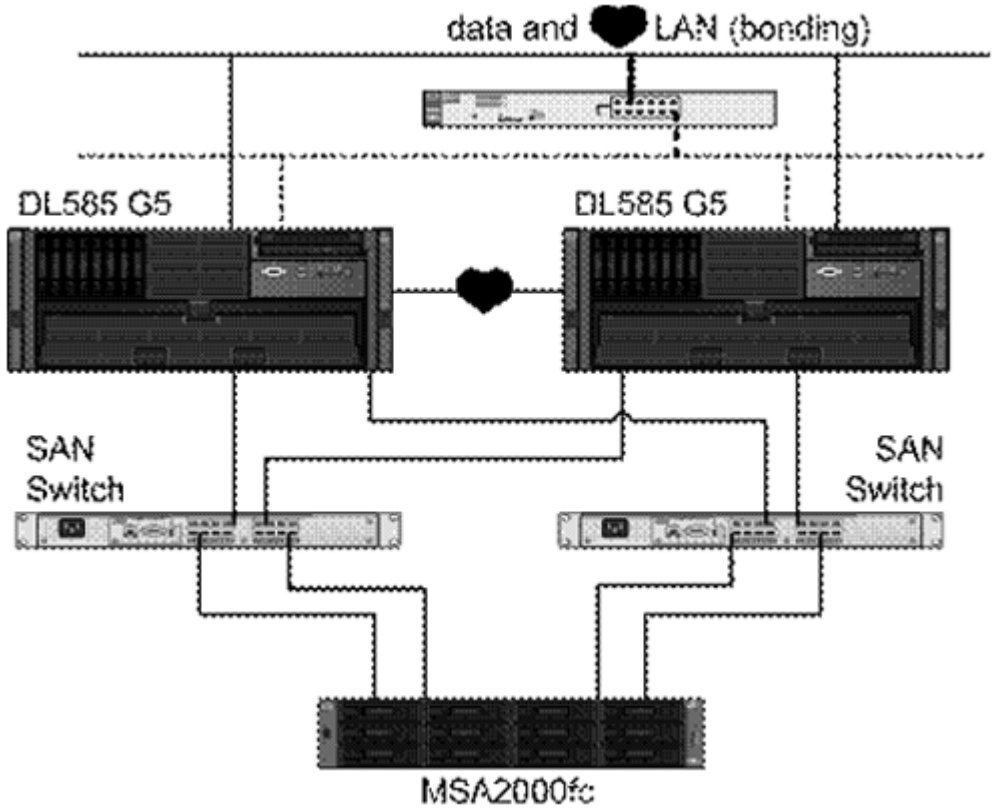


Figure 3: HP's recommended cluster configuration for Fibre Channel using a dual-controller Fibre Channel system in a switch attach configuration.



Specifications

Disaster Tolerant Solutions

HP Serviceguard Extended Distance Cluster for Linux

HP Serviceguard Extended Distance Cluster (XDC) for Linux is a disaster-tolerant clustering solution that provides failover capabilities for mission-critical data and applications up to 100 kilometers, ensuring that customers' businesses remain running in the event of a system failure or disaster. It is designed to protect applications from a wide variety of software and hardware failures, monitoring the health of each server (node) and quickly responding to failures including system processes, system memory, LAN media and adapters, and application processes. XDC employs software RAID mirroring to replicate data and requires the use of Serviceguard for Linux, which is available for purchase separately.

Product Configuration Rules

- Supports Red Hat EL 4 Update 3 or later, and Red Hat EL 5; SLES9 SP2 or later, and SLES10
- Supports both HP ProLiant servers and Integrity servers
- Requires Serviceguard for Linux (11.16.07 or later)
- Compatible with all Serviceguard for Linux-supported Fibre Channel storage
- Must use a quorum service in a third site
- Support for 2-node or 4-node clusters

Features

- Automated recovery point objective (RPO) timer
- Automatic, bi-directional data and application failover up to 100 km
- Software-based mirroring
- Cluster enablement of the MD (multi device) driver
- Integrated with Serviceguard for Linux
- Tightly integrated with HP hardware, software, and services
- Open source components

Benefits

- Gives customers more flexibility by enabling them to define the time period for acceptable data loss
- Enables both sites to run applications concurrently, better utilizing all resources
- Compatible with all Fibre Channel storage arrays supported by Serviceguard for Linux
- Added protection against data corruption by the MD driver
- Integration with Serviceguard for Linux enables key features such as rolling upgrades and workload balancing
- Accountability from one vendor
- Leverages non-proprietary, industry-standard technologies, enabling use of existing in-house expertise

For more information, please visit: http://www.hp.com/go/xdclinux.

Specifications

HP StorageWorks Cluster Extension for Linux for XP and EVA Storage Arrays

HP StorageWorks Cluster Extension (CLX) software offers protection against system downtime from fault, failure, and disasters. It enables flawless integration of the remote mirroring capabilities of HP Continuous Access with the high-availability capabilities provided by HP Serviceguard for Linux. This extended-distance solution allows for more robust disaster recovery topologies as well as automatic failover, failback, and redirection of mirrored pairs for accelerated recovery.

- For XP and EVA disk arrays
- Supports RedHat and SUSE SLES

For more information and support details, please visit:
HP StorageWorks XP Cluster Extension: http://www.hp.com/go/clxxp
HP StorageWorks EVA Cluster Extension: http://www.hp.com/go/clxeva

HP StorageWorks XP Cluster Extension Linux	T1657A
HP StorageWorks EVA Cluster Extension Linux LTU	T4393A

Cluster topology and geography with XP and EVA Cluster Extension

- The current maximum number of nodes supported is 16. A Quorum Service node is required to provide arbitration to clusters in a CLX configuration. It provides arbitration services for the cluster when a cluster partition is discovered. A node running the Quorum Service cannot be a member of any cluster to which it is providing cluster quorum services.
- The recommended configuration implements two data centers with the nodes of the cluster split equally between them and a third site housing the Quorum Service.
- The minimum supported configuration is two data centers, with one of the data centers housing the Quorum Service. In this configuration, if the data center housing the Quorum Service is down, the nodes in the second data center will not be able to form the cluster, as there is no quorum. At the minimum, the Quorum Service should be in a separate room with its own power circuit.
- The maximum distance between the data centers is currently limited either by the maximum distance supported for the networking type or by the Continuous Access link being used, whichever is shorter - but no more than 100 kilometers, when integrated with Serviceguard for Linux.
- DWDM (Dense Wave Division Multiplexing) device can be used for the network and data replication links to increase the distance up to 100 kilometers between data centers, when integrated with Serviceguard for Linux.

Cluster networking links with XP and EVA Cluster Extension

- The supported network interfaces used for cluster heartbeat are 10Base-T and 100Base-T.
- Maximum 500 km cable length distance for IP network and FC SAN with maximum of 20 ms round-trip delay between servers and between EVAs
- No routing is allowed for the cluster heartbeat network between the data centers.
- There must be at least two alternately routed cluster heartbeat links between the data centers to prevent the "backhoe problem". The "backhoe problem" can occur when all cables are routed through a single trench and a tractor on a construction job severs all cables, disabling all communications between the data centers.
- One of the heartbeat links has to be a dedicated link. The other heartbeat link can be shared with the application network link.

Data replication Continuous Access links

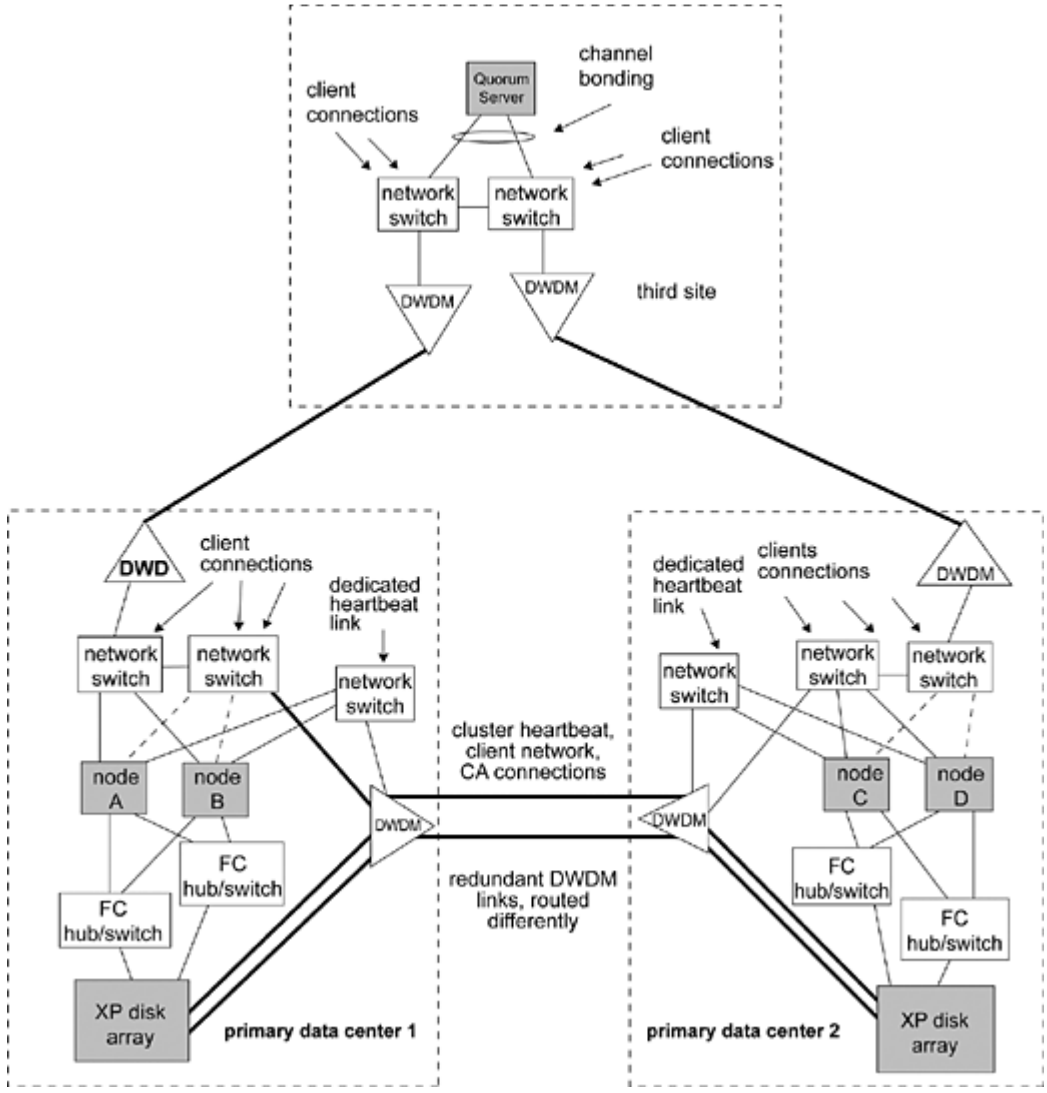
There must be at least two alternately routed Continuous Access links between the two primary data centers.

NOTE: The maximum distance between the two primary data centers is currently limited either by the maximum distance supported for the cluster networking type or by the Continuous Access link being used, whichever is shorter.

Specifications

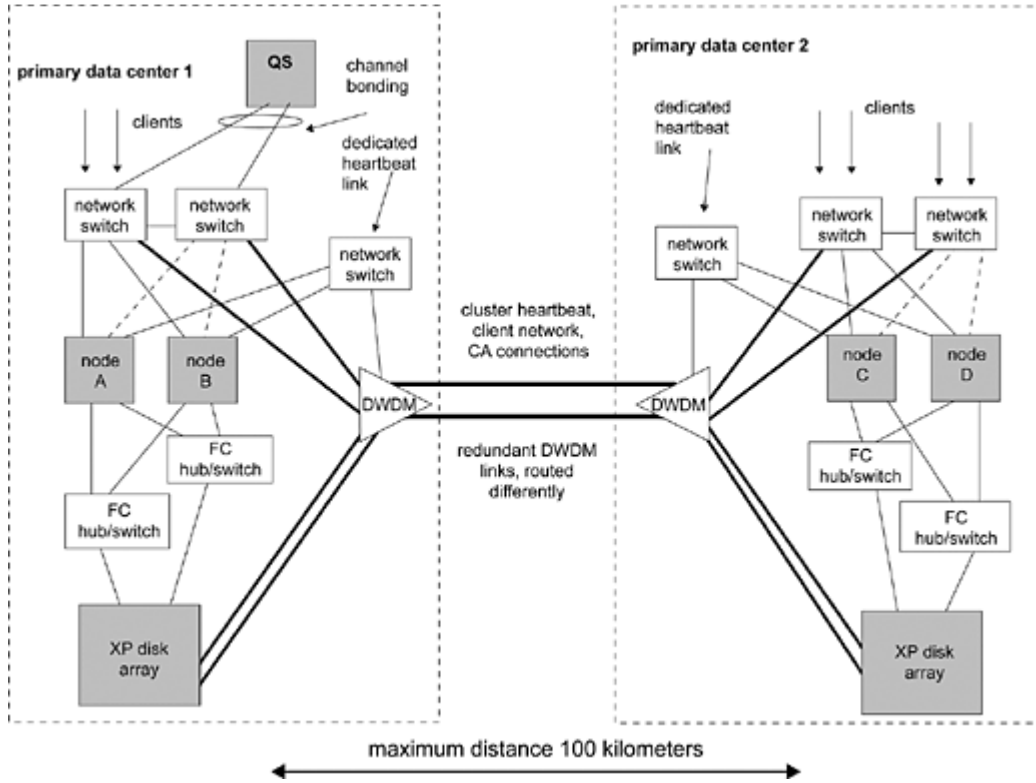
DWDM links for both networking (cluster heartbeat and application network) and Continuous Access	• The maximum distance supported between the data centers for a DWDM configuration is 100 kilometers. • Both the networking (cluster heartbeat and application network) and Continuous Access links can go through the same DWDM box. A separate DWDM box is not required. • The fiber-optic links between the DWDM boxes must be "dark fiber" links, non-switched circuits. There must be two alternately routed links between the two primary data centers. • For the highest availability, it is recommended to have two separate DWDM boxes (in each data center) used for the links between each data center. However, since most DWDM boxes are typically designed to be fault tolerant, it is acceptable to use only one DWDM box (in each data center) for the links between each data center. If a single DWDM box is used, a minimum of one active and one redundant standby fiber link feature of the DWDM box must be configured. When using ESCON for Continuous Access, note that the ESCON timeout is shorter than the DWDM link failover time. Therefore, a minimum of two active fiber links on the DWDM box must be configured.
Quorum service	• With only one IP address configurable for a Quorum Service, it is suggested to configure the LAN used for the Quorum Service IP address with two or more physical LAN cards using Channel Bonding to improve the availability of the Quorum Service if a LAN card failure occurs. A node running the Quorum Service cannot be a member of any cluster to which it is providing cluster quorum services. You can create the Quorum Server to be a package, so it is highly available. The package must run outside the cluster that the quorum server serves. • The Quorum Service can provide arbitration services for up to 100 heterogeneous clusters or 300 cluster nodes. Some versions of Serviceguard (See Quorum Server Release Notes) support new functionality in the Quorum Server that allows you to configure more than one subnet on which communication between the Quorum Server and the cluster nodes can take place.

Recommended configuration with two data centers and the Quorum Server in a third location.



In the example above, the DWDM boxes connected between the two Primary Data Centers are configured with multiple dark fibre links. The DWDM links are used for both networking and Continuous Access data replication. If the DWDM box is fault tolerant, only one is required in each data center. If it's not fault tolerant, two are required in each data center. The Quorum Service site distance can be up to 100 kilometers away from either Primary Data Center since DWDM links are also used. The Quorum service can be on a different subnet than the cluster. It is also supported to connect to the Arbitrator data center without DWDM links, as long as the distance is within the allowed specifications for the network type being used.

Minimum supported configuration with two data centers below:



In the example above, the Quorum Service is in data center 1. Note that if data center 1 is down, the cluster nodes in data center 2 will not be able to form a new cluster. Therefore, this configuration is not recommended.

Software requirements

The solution requires the following software:

XP implementation

- Red Hat Enterprise Server or SUSE Linux Enterprise Server
- HP Serviceguard for Linux
- Quorum Server
- XP RAID Manager
- XP firmware
- HP XP Cluster Extension Linux
- HP XP Continuous Access
- HP StorageWorks HBA

EVA Implementation

- RedHat Enterprise Linux or SUSE Linux Enterprise Server
- HP Serviceguard for Linux
- EVA Command View
- EVA firmware VCS for EVA3000/5000 or EVA firmware XCS for EVA4000/6000/8000
- HP EVA Cluster ExtensionLinux
- HP EVA Continuous Access
- QLogic multipath

Specifications

For more information

For more information regarding this solution, go to:
XP Cluster Extension: http://www.hp.com/go/clxxp
EVA Cluster Extension: http://www.hp.com/go/clxeva
To learn more about HP's other Serviceguard high availability products and solutions, please visit:
http://www.hp.com/go/serviceguard
http://www.hp.com/go/sglx
http://www.hp.com/go/sglx/gfs

Environment-friendly Products and Approach

End-of-life Management and Recycling

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

The EU WEEE directive (2002/95/EC) 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 web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.