

Overview

Are you faced with a hard-to-manage data explosion? The exponential growth of unstructured data can lead to rampant infrastructure costs. To gain control of your web and file-based data, you need a new storage solution that scales affordably and seamlessly.

The HP X9000 Network Storage Systems scale-out beyond traditional NAS in both capacity and performance. Designed to be extremely scalable, flexible, and cost-efficient, the X9000 systems deliver excellent performance and a modular storage infrastructure to accommodate unprecedented storage growth and performance. Central management allows the administrator to manage not just terabytes but multi-petabyte environments at the highest density possible. The pay-as-you-grow architecture lets customers avoid storage over-provisioning and manage costs. With an all-inclusive feature set there are no hidden or future costs of expensive add-ons. X9000 is the ideal platform for customers designing the next generation data center.

What's New

More solution flexibility:

- Software snapshots use namespace versioning to provide continuous and real-time view of past, allowing users to recover deleted files and administrator to restore system data (coming soon)
- Data archiving features include file immutability, retention period at the file level, and data validation and verification (coming soon)
- Expanded protocol support includes NFS, CIFS, HTTP/S, WebDAV (coming soon), FTP/S and NDMP
- X9320 adds versatility and performance; start smaller, size to fit, Enterprise and midline SAS in the same system (tier-in-a-box) and 6G SAS Enterprise manageability tools now include Storage Essentials and Insight Remote Support Consolidated block and file storage with 3PAR and X9300 Network Storage Gateway
- G7 Servers deliver more performance and use Less Power

Models

HP X9320 Network Storage Systems

HP X9320 Network Storage Systems are versatile, highly available, scale-out storage solutions that allow customers to add a performance or capacity systems quickly and easily into their environment for file data workloads.

| | |
|--|--------|
| HP X9320 1GbE Performance Block | QP330A |
| HP X9320 10GbE Performance Block | QP331A |
| HP X9320 IB Performance Block | QP332A |
| HP X9320 24TB Capacity Block Starter Kit | QP333A |
| HP X9320 24TB Capacity Block Exp Kit | QP334A |
| HP X9320 48TB Capacity Block Starter Kit | QP335A |
| HP X9320 48TB Capacity Block Exp Kit | QP336A |
| HP X9320 14.4TB Capacity Block Start Kit | QP337A |
| HP X9320 14.4TB Capacity Block Exp Kit | QP338A |

Overview



Performance
Block

Capacity Block
Starter Kit

Capacity Block
Expansion Kit

HP X9720 Network Storage System

HP X9720 Network Storage System is a turn-key, highly dense scale-out NAS appliance designed for those customers with extreme capacity needs.

HP X9720 Network Storage System Base Rack

HP X9700 Server Chassis

HP X9700 Blade Server

HP X9700 82TB Capacity Block

HP X9700 164TB Capacity Block

HP X9700 Expansion Rack

AW548A

AW549A

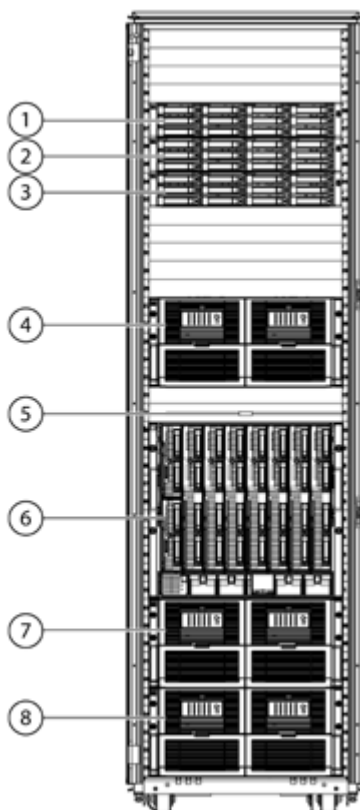
AW550C

AW551A

AW598B

AW552A

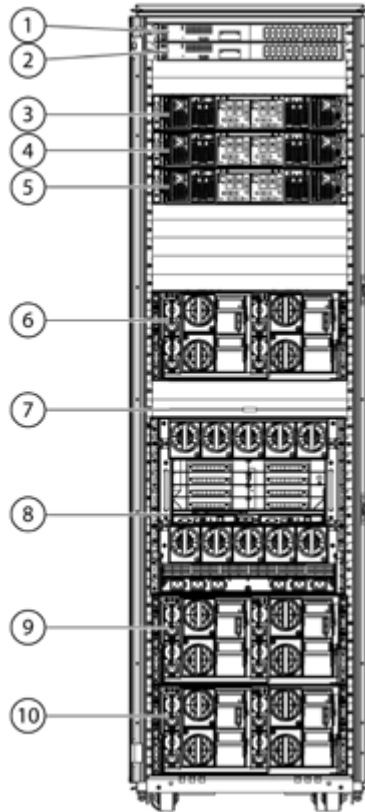
Overview



Front View of an HP X9720 base cabinet with three storage blocks

- | | |
|---|--|
| 1. X9720c 3, (Capacity block controllers and storage) | 5. TFT monitor and keyboard |
| 2. X9720c 2, (Capacity block controllers and storage) | 6. Blade server enclosure |
| 3. X9720c 1, (Capacity block controllers and storage) | 7. X9720cx 2, (Capacity block storage) |
| 4. X9720cx 3, (Capacity block storage) | 8. X9720cx 1, (Capacity block storage) |

Overview



Rear view of HP X9720 Network Storage System with three storage blocks

- | | |
|---|---|
| 1. Management switch 2 | 6. X9720cx 3, (Capacity block storage) |
| 2. Management switch 1 | 7. TFT monitor and keyboard |
| 3. X9720c 3, (Capacity block controllers and storage) | 8. Blade server enclosure |
| 4. X9720c 2, (Capacity block controllers and storage) | 9. X9720cx 2, (Capacity block storage) |
| 5. X9720c 1, (Capacity block controllers and storage) | 10. X9720cx 1, (Capacity block storage) |

HP X9300 Network Storage Gateways

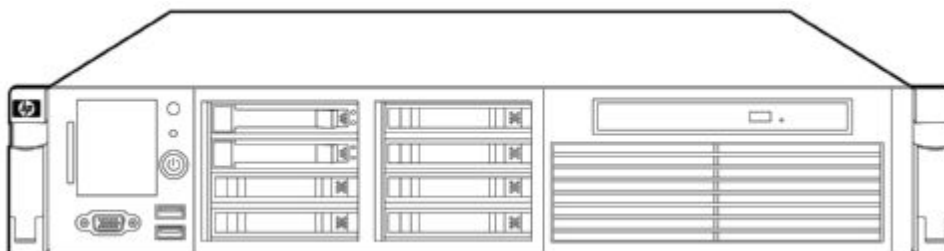
The HP X9300 Network Storage Gateways are flexible, scale-out solutions that bring feature rich gateway file services to HP 3PAR, P4000, P2000, EVA, or 3rd party arrays or SANs.

HP X9300 1GbE Network Storage Gateway

AW539C

HP X9300 10GbE/IB Network Storage Gateway

AW540C



HP X9300 Network Storage Gateway

HP X9300 Management Server

The HP X9300 Management Server provides a dedicated platform for cluster maintenance, monitoring and remote management services. The Management Server Software can also be run non-dedicated on one or more File Serving Nodes.

HP X9300 Management Server

AW547C

Overview



HP X9300 Management Server

Features and Benefits

| | |
|---|---|
| Single global namespace that scales up to 16 PB's | Conveniently manage up to 16 PB of data in a single global namespace and up to 1000+ nodes to evolve with your business needs. Flexibly mix and match storage topologies (SAN/NAS) within the single domain, to optimize performance and better leverage storage assets |
| Centralized management | More effectively manage file system provisioning, performance and optimization from a centralized, single pane of glass management tool, reducing administrative loads and helping IT staff to be more productive |
| Automated data mobility and load balancing | Automated data mobility and load balancing that enables customers to respond quickly to changing demands and improve TCO |
| HP management tools | Integration with higher level management tools that helps customers better manage the overall infrastructure and further reduce administrative loads. Frameworks supported include HP SIM, Storage Essentials and Insight Remote Support to better serve customer support needs |
| Policy-based Automatic Data Tiering | Non-disruptive and automated policy based data tiering enables performance or capacity optimization for initial placement and automated movement between tiers |
| Protect and manage critical data | Ability to protect and manage critical data with retention policies, Write Once (WORM) file immutability to ensure regulatory compliance, and broad ISV support for optimal solution support (coming soon) |
| Pay as you grow | Pay as you grow by easily adding nodes or storage components as requirements evolve. No need to overprovision your IT investments, you evolve with your business needs. The all inclusive software model ensures you have access to the data services you need to maximize your investment |
| Converged Infrastructure | Converged Infrastructure that reduces capital and operation costs. Built on ProLiant DNA with features like iLO, intelligent power, and Insight Remote Support to reduce operational overhead |
| Scale capacity and performance independently | Scale capacity and performance independently with fully distributed meta-data and multi-node architecture to avoid controller bottlenecks, eliminate hotspots and enhance availability |
| Resilient | Maintain growth and load-balance changing workloads without disruption for greater resiliency. The small addressable block size (4k) enables high performance for ALL workloads - Small file Random, Large file Sequential, mixed random and sequential workloads, and metadata intensive workloads |
| Easily add/replace nodes, and migrate storage components to new technologies | Easily add/replace nodes, and migrate storage components to new technologies without disruption for ultimate investment protection and future proofing. A single button data evacuation service enables a persistent data access layer with simple and secure change management |
| Rich Set of data services | A Rich Set of all inclusive data services improves operational flexibility and enables you to better manage your deployment. They include: policy based tiering, Continuous Remote Replication, snapshots, automatic storage balancing, and data evacuation |

Standard Features – HP X9320 Network Storage System

Performance Blocks Each X9320 Performance Block SKU contains two File Serving Nodes. The following detail is per File Serving Node. The difference between the three Performance Block models is the public network interface. The model ordered must have the network interface required to connect the X9320 system to the customer's network.

File Serving Node HP ProLiant DL 380 Generation 7 (G7)
http://h18004.www1.hp.com/products/quickspecs/13595_div/13595_div.html

Processor / Cache Two quad core Intel® Xeon® Processors E5620 (2.40 GHz, 12MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)

Memory 48GB (12 x 4GB) HP 4GB 1Rx4 PC3-10600R-9 Kit

| Network Ports | Description | Part Number | 1 GbE Ports | 10 GbE Ports | IB Ports |
|---------------|----------------------------------|-------------|-------------|--------------|----------|
| | HP X9320 1GbE Performance Block | QP330A | 8 | 0 | 0 |
| | HP X9320 10GbE Performance Block | QP331A | 4 | 2 | 0 |
| | HP X9320 IB Performance Block | QP332A | 4 | 0 | 2 |

NOTE: Each File Serving Node comes with 4-1 GbE ports for connectivity to the private cluster network all other ports are intended for connectivity to the customer data network.

Storage Controller File Serving Node storage controllers:
 External storage HBA: (2) HP SC08e SAS HBA
 Internal storage controller: (1) Embedded P410i Smart Array Controller
 Internal storage RAID level: 1

Disk Drives (2) HP 300GB 6G SAS 10K SFF DP ENT HDD

Power / Cooling Redundant hot plug replaceable power supply and fan modules in all servers.
 2 high voltage power cords (IEC C13 to C14) standard per server.

NOTE: X9000 series Network Storage Systems are primarily connected to PDUs in racks, so they ship standard with only PDU C-14 to C13 power cord(s). However, alternative power cords and power connectivity options exist. See the ProLiant DL Server and P2000 array QuickSpecs on hp.com for additional information on available options.

Capacity Block Starter Kit The Capacity Block Starter Kit is the primary storage building block for the system. A X9320 system can be configured with 1 or 2 starter kits. Each Capacity Block Starter Kit includes two active-active controllers, two 12 drive LFF disk enclosures and 24 HDD's. There are three starter kit models. The difference in the kits is the models of HDD's included:

Controller: HP P2000 G3 SAS MSA Array System Controller
http://h18000.www1.hp.com/products/quickspecs/13551_div/13551_div.html

Number of controllers: 2

Controller cache: 2 GB per controller

RAID levels: 5 / 6 (based on model)

LUNs: 512

Maximum LUN size: 16TB

Host interconnect: 4x 6Gb SAS host ports per controller

Standard Features – HP X9320 Network Storage System

| | |
|-------------------------|---|
| Disk Drives | Capacity Block Starter Kit models include 2-12 drive disk enclosures with 24 LFF HDDs. HDD Model options: HP P2000 600GB 6G SAS 15K LFF (3.5 inch) DP ENT HDD AP860A HP P2000 1TB 6G SAS 7.2K LFF (3.5 inch) DP MDL HDD AP861A HP P2000 2TB 6G SAS 7.2K LFF (3.5 inch) DP MDL HDD AW555A |
| Power / Cooling | Redundant hot plug replaceable power supply and fan modules in all disk enclosures. 2 high voltage power cords (IEC C13 to C14) standard per disk enclosure. NOTE: X9000 series Network Storage Systems are primarily connected to PDUs in racks, so they ship standard with only PDU C-14 to C13 power cord(s). However, alternative power cords and power connectivity options exist. See the ProLiant DL Server and MSA array QuickSpecs on hp.com for additional information on available options. |
| Storage Capacity | Capacity Block Starter Kit Storage Capacity <ul style="list-style-type: none">• 11.4 TB usable capacity, 14.4 TB raw capacity with 24 600GB 6G SAS HDDs• 16 TB usable capacity, 24 TB raw capacity with 24 1TB 6G ML SAS HDDs• 32 TB usable capacity, 48 TB raw capacity with 24 2TB 6G ML SAS HDDs" |

Management Features HP X9300 Management Server provides management of the X900 storage system and can be accessed via web browser.

HP ProLiant Onboard Administrator, powered by the Integrated Lights-Out 3 management processor simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration. It functions without additional software, and can be accessed from any location via a web browser.

X9300 Management Server

For additional information, please see: www.hp.com/go/iLOThe Management Server provides services used by the storage system to maintain cluster membership, quota management, file namespace management and a web based graphical user interface. HP X9000 Network Storage Systems require a Management Server to support cluster operations. The Management Server software can be run on a dedicated server (AW547C) or the software can be run on one or more of the clusters file serving nodes.

A preconfigured dedicated Management Server is automatically added to all orders but can be removed if not needed. If the customer has an operating X9000 cluster with one or more Management Servers an additional server is not required. More than one Management Server (dedicated, non-dedicated or combination) can be configured for high availability purposes. You cannot configure or operate an X9000 cluster without a Management Server (dedicated or non-dedicated)

NOTE: The dedicated Management Server (AW547C) is sold separately. The non-dedicated Management Server software is included with all X9000 systems.

| | |
|-------------------|---------------------------------|
| Server Platform | HP ProLiant DL 360 G7 |
| Form factor | 1U rack optimized |
| NIC Ports | 6 x 1GbE |
| Power Supplies | 2 |
| Remote management | HP Integrated Lights Out (iLO3) |

Standard Features – HP X9320 Network Storage System

Rack Airflow Requirements

Rack 10000 series Cabinets

The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors.

CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 5,350 sq cm (830 square inches) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).

Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 7 cm (2.75 inches)

CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

NOTE: For additional information, refer to the Setup and Installation Guide or the Documentation CD provided with the server, or to the server documentation located in the Support section at the following URL:

<http://h18000.www1.hp.com/products/servers/proliantdl145/index.html>

Telco and Threaded Hole Rack Support

Telco Rack Kit:

NOTE: Support for all 2-post Telco racks requires the use of the standard rack kit and an additional option kit from Rack Solutions: <http://www.racksolutions.com/hp>

Configuration Instructions - HP X9320 Network Storage System

Introduction

Configuring and ordering an HP X9320 Network Storage System is an easy process. The ordering tools are pre-populated with built-in rules to ensure your X9320 system is properly configured. You will only need to specify the Performance Block model based on the customer network connectivity, the number and type of capacity blocks, and any system options required and the ordering system will build the appropriate X9320 storage solution.

HP X9320 Series Network Storage Systems

| | | |
|------------------------------|-----------------------------------|---|
| Common Specifications | OS and File System | RedHat Enterprise Linux 5.5 64-bit X9000 File Serving Software 5.6 with licensing for all features including: <ul style="list-style-type: none">- Snapshots, file based (coming soon)- Snapshots, array based- Data Retention/WORM (coming soon)- Policy Based Tiering- Continuous Remote Replication- Data Rebalancing |
| | Protocol Support | NFS, CIFS, HTTP, HTTPS, FTP, FTPS and NDMP |
| | Optical Drive | DVD-RW standard for QuickRestore disaster recovery |
| | Remote Access | HP ProLiant Integrated Lights-Out 3 with Advanced Pack license |
| | Performance Block Platform | HP ProLiant DL380 G7 http://h18004.www1.hp.com/products/quickspecs/13595_div/13595_div.html |
| | Capacity Block Platform | HP P2000 G3 Modular Smart Array Systems http://h18000.www1.hp.com/products/quickspecs/13551_div/13551_div.html |
| | Form Factor (Configurable) | From 8U (24 HDD models) To 20U (96 HDD models) |
| | Factory Racking | Flexible factory racking is offered for the X9320. Factory racking for X9320 systems with other HP products such as additional X9000 series systems, HP ProLiant Servers and HP storage arrays is available based on the configuration. NOTE: #0D1 will appear after the part number on the sales order if HP factory integration is supported. |

Options - HP X9320 Network Storage System

There are three major components used in an X9320 system:

HP X9320 Performance Block

HP X9320 Capacity Block Starter Kit

HP X9320 Capacity Block Expansion Kit

Step 1 Choose a Performance Block Model

The difference between the three Performance Block models is the public network interface. The model ordered must have the network interface required to connect the X9320 system to the customer's network.

| | |
|--|--------|
| HP X9320 1GbE Performance Block | QP330A |
| Includes two File Serving Nodes Includes 4- 1GbE ports (HP NC364T) per node for connectivity to the customer's network | |
| NOTE: All X9320 Performance Block models include 4-1 GbE ports per node for connectivity to the X9000 cluster network | |
| HP X9320 10GbE Performance Block | QP331A |
| Includes two File Serving Nodes | |
| Includes 2 -10GbE ports (NC550SFP) per node for connectivity to the customer's network | |
| NOTE: All X9320 Performance Block models include 4-1 GbE ports per node for connectivity to the X9000 cluster network | |
| HP X9320 IB Performance Block | QP332A |
| Includes two File Serving Nodes | |
| Includes 2 - Infiniband ports (HP IB 4X QDR CX-2 PCIe G2 Dual Port HCA) per node for connectivity to the customer's network | |
| NOTE: All X9320 Performance Block models include 4-1 GbE ports per node for connectivity to the X9000 cluster network | |

Step 2 Choose the Capacity Block Starter Kit(s) (minimum 1, maximum 2)

The Capacity Block Starter Kit is the primary storage building block for the system. A X9320 system can be configured with 1 or 2 starter kits. There are three starter kit models to choose from. The difference in the kits is the model of HDD's included. Starter kit s do not have to match. Different starter kits can be used in a system.

| | |
|---|--------|
| HP X9320 24TB Capacity Block Starter Kit | QP333A |
| Includes two array controllers, 2-12 bay LFF drive enclosures with 24 7200 1TB ML SAS drives | |
| HP X9320 48TB Capacity Block Starter Kit | QP335A |
| Includes two array controllers, 2-12 bay LFF drive enclosures with 24 7200 2TB ML SAS drives | |
| HP X9320 14.4 Capacity Block Starter Kit | QP337A |
| Includes two array controllers, 2-12 bay LFF drive enclosures with 24 15K, 600GB Ent SAS drives | |

Options - HP X9320 Network Storage System

Step 3 Choose the Capacity Block Expansion Kit(s) (minimum 0, maximum 2)

The Capacity Block Expansion Kits are optional storage used to increase the system capacity. One expansion kit can be added to each starter kit. The HDD model of the expansion kit must match the HDD model of the starter kit. A X9320 system can be configured with 0, 1 or 2 expansion kits. There are three expansion kit models. The kits differ by the model of HDD's included.

| | |
|--|--------|
| HP X9320 24TB Capacity Block Exp Kit Includes 2-12 bay LFF drive enclosures with 24 7200 1TB ML SAS drives | QP334A |
| HP X9320 48TB Capacity Block Exp Kit Includes 2-12 bay LFF drive enclosures with 24 7200 2TB ML SAS drives | QP336A |
| HP X9320 14.4 Capacity Block Exp r Kit Includes 2-12 bay LFF drive enclosures with 24 15K, 600GB Ent SAS drives | QP338A |

Step 4 Choose the System Options

The following options are available for X9320 Network Storage Systems. For more information on X9000 compatibility with HP and non-HP hardware and software please visit the Single Point of Connectivity Knowledge (SPOCK) website:

<http://h20272.www2.hp.com/>

Add a Rack

The X9300 and X9320 support flexible factory rack-mounting options in either a standard 42U cabinet based on the HP 10000 G2 Series Rack or a choice of 42U extended, 36U and 22U heights.

The default rack selection for the X9300 and X9320 is the HP Universal Rack 10642 G2 Shock. The following options are automatically added to the CONFIGURATION, BY THE HP CONFIGURATORS (such as Watson or SBW)), when factory rack integration is selected:

- TFT (Keyboard with integrated mouse and 1U 17 inch flat panel display)
- KVM server console switch
- KVM IP Console 8-pack interface adapter
- (2) HP ProCurve E2910al-48G Switch W/ 10-GbE Interconnect Kit

NOTE: Factory rack integration should be selected unless a plan has been established for integrating the HP X9000 Network Storage System into the customer's existing environment. If a rack is not included with the order a network switch will not be included for the internal cluster network. A switch will be required and should be added to the order unless it will be provided by the customer.

Add 10 GbE Cables and Transceivers

HP X9320 Network Storage Systems with 10 GbE NIC's require Direct Attach Cables (DAC) for copper environments or fiber transceivers and cables for fiber-optic environments to connect to the facility network. There are multiple options and they must match the facility networking. If the customer does not already have the needed DAC's or fiber transceivers available at their site, then the correct ones should be selected. Up to four 10 GbE connections are supported per X9320. Without at least two DAC's or fiber transceivers per X9320 you will not be able to connect the system to the facility network.

For more information please see the HP NC550SFP Dual Port 10GbE Server Adapter QuickSpecs http://h18000.www1.hp.com/products/quickspecs/13555_na/13555_na.pdf.

Options - HP X9320 Network Storage System

Spare Disk Drives

| | | |
|-------------------------|--|--------|
| P2000 LFF (3.5") | Large Form Factor (LFF) P2000 Hard Drives | |
| | SAS Drives 3.5", Hot Plug | |
| | HP P2000 600GB 6G SAS 15K 3.5in ENT HDD | AP860A |
| | SAS Drives 3.5", Hot Plug | |
| | HP P2000 2TB 6G SAS 7.2K 3.5in MDL HDD | AW555A |
| | SATA Drives 3.5", Hot Plug | |
| | HP P2000 1TB 6G SAS 7.2K 3.5in MDL HDD | AP861A |

Add a Power Cord

HP X9000 Network Storage Systems come standard with at least one rack (IEC-IEC) PDU power cord. If you wish to use wall outlet power instead, you can choose a country- or region-specific power cord.

| | | |
|----------------------|---|--------|
| X9300 / X9320 | HP 1.83m 10A C13-UL US Power Cord | AF556A |
| | HP 1.83m 10A C13 China Power Cord | AF557A |
| | HP 2.5m 10A C13-Argentina Power Cord | AF558A |
| | HP 1.83m 10A C13 Brazil Power Cord | AF559A |
| | HP 1.83m 10A C13 Korea Power Cord | AF560A |
| | HP 1.83m 10A C13 Taiwan Power Cord | AF561A |
| | HP 2.0m 10A C13 India Power Cord | AF562A |
| | HP 2.5m C13 AU/NZ Power Cord | AF569A |
| | HP 1.83m 10A C13 CH Power Cord | AF565A |
| | HP 1.83m 10A C13 DK Power Cord | AF566A |
| | HP 1.83m 10A C13 EU Power Cord | AF568A |
| | HP 1.83m 10A C13 IL Power Cord | AF564A |
| | HP 1.83m C13 IT/CL Power Cord | AF571A |
| | HP 2m C13 Japan Power Cord | AF572A |
| | HP 1.83m 10A C13 UK Power Cord | AF570A |
| | HP 2.5m C13 ZA/IN Power Cord | AF567A |
| | HP 1.83m 10A C13 NBR14136 Brazil Power Cord | AF591A |

Specifications - HP X9320 Network Storage System

X9320 System Environmental Specifications

| Specification | MinSystem - 1 Perf Block, 1 Cap Block Starter Kit: | MaxSystem - 1 Perf Block, 2 CB Starter Kits, 2 CB Exp Kits: | Each Perf Block | Each Cap Block Starter Kit | Each Cap Block Exp Kit | 2 - Net Switches | Mgmt Server (Optional) |
|-------------------------|--|--|-----------------------|--|---------------------------------|---------------------|------------------------------|
| Current - Amps (240VAC) | 12 | 22.2 | 8.6 | 3.4 | 3.4 | 2.2 | 2.1 |
| Max Power - Watts | 2396 | 4640 | 1,648 | 748 | 748 | 210 | 504 |
| Max Thermal - btu/hr | 8181 | 15843 | 5,627 | 2,554 | 2554 | 717 | 1,720 |
| Weight - lbs | 211 | 496 | 110 | 101 | 92 | 22 | 35 |
| Weight - kg | 96 | 226 | 50 | 46 | 42 | 10 | 16 |
| Form Factor - Units | 8U | 20U | 4U | 4U | 4U | 2U | 1U |

Standard Features – HP X9720 Network Storage System

| | | |
|------------------------------|-----------------------|---|
| HP X9700 Blade Server | Blade Server Platform | HP ProLiant BL460c Generation 7 (G7) http://h18004.www1.hp.com/products/quickspecs/12518_na/12518_na.html |
| | Processor | Two Quad core Intel® Xeon® Processors E5620 (2.40 GHz, 12MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) |
| | Memory | 24GB (6 x 4GB) HP 4GB 1Rx4 PC3-10600R-9 Memory Kit |
| | Expansion Slots | Mezzanine Slot 1 - HP Smart Array P700M/512 Controller, external storage interface Mezzanine Slot 2 - Open |
| | Network Ports | Integrated NC553i Dual Port FlexFabric 10Gb Adapter provides 2 - 1/10 GbE ports exposed through the Server Chassis Virtual Connect modules |
| | Internal Storage | Two Internal HP 300GB 10K 6G 2.5 SAS DP HDD |

| | | |
|--------------------------------|--------------------------|---|
| HP X9700 Server Chassis | Server Chassis Platform | C7000 c-Class Enclosure |
| | Capacity | 16 Blade Server Bays, 8 Interconnect Bays |
| | Storage Ports | HP 3Gb SAS Switch BladeSystem Dual Pack, bays 3&4, 8-4x ports (32 SAS lanes) per module, 16-4x ports (64 SAS lanes) total |
| | Network Ports - External | 2 - HP Z BLc VC Flex-10 Enet Module, VCM, bays 1&2, 8 - 10GbE ports per module, 16 - 10 GbE, ports total |
| | Form Factor | 10U |

| | | |
|---------------------------------------|--------------------|--|
| HP X9700 Capacity Block (82TB) | Storage Controller | MSA2060 Storage Array, Active-Active Controllers, 12 HDD Enclosure |
| | Storage | 70 HDD SAS/SATA Enclosure |
| | Drives | 82 HP 1TB 7.2k DP MDL SAS HDD (461137-B21), Hot Swappable |
| | RAID Configuration | RAID6 8+2, 2 Universal spares |
| | Capacity | 82TB Raw, 60TB Useable |
| | Form Factor | 7U |

| | | |
|--------------------------------------|--------------------|--|
| HP X9700 164TB Capacity Block | Storage Controller | MSA2060 Storage Array, Active-Active Controllers, 12 HDD Enclosure |
| | Storage | 70 HDD SAS/SATA Enclosure |
| | Drives | 82 HP 2TB 7.2k DP MDL SAS HDD (604081-001), Hot Swappable |
| | RAID Configuration | RAID6 8+2, 2 Universal spares |
| | Capacity | 164TB Raw, 120TB Useable |
| | Form Factor | 7U |

| | | |
|---|------------|---|
| HP X9720 Network Storage Sys Base Rack | Rack Model | HP 10642 Universal G2 Rack (42U) |
| | PDU's | 4, model varies by region and choice of single phase or three phase, HP 32A HV Core Only Corded PDU (252663-B33) HP 24A HV Core Only Corded PDU (252663-D74) HP 40A HV Core Only Corded PDU (252663-D75) HP 3PH 24A NA Mod PDU (AF512A) HP 3PH 16A INTL Mod PDU (AF513A) |
| | TFT | Automatically added to the rack by the ordering system based on the region: AZ870A HP TFT7600 KVM Console US Kit |



Standard Features – HP X9720 Network Storage System

| | |
|---------------------------------------|---|
| | AZ871A HP TFT7600 KVM Console UK Kit |
| | AZ872A HP TFT7600 KVM Console GR Kit |
| | AZ873A HP TFT7600 KVM Console FR Kit |
| | AZ874A HP TFT7600 KVM Console Intl Kit |
| | AZ875A HP TFT7600 KVM Console SP Kit |
| | AZ876A HP TFT7600 KVM Console Den Kit |
| | AZ877A HP TFT7600 KVM Console Nw Kit |
| | AZ878A HP TFT7600 KVM Console SE-FI Kit |
| | AZ879A HP TFT7600 KVM Console Swi Kit |
| | AZ880A HP TFT7600 KVM Console Port Kit |
| | AZ881A HP TFT7600 KVM Console Bel Kit |
| | AZ882A HP TFT7600 KVM Console JPN Kit |
| | AZ883A HP TFT7600 KVM Console Rus Kit |
| | AZ884A HP TFT7600 KVM Console Intl Kit |
| Network Ports - Internal Cluster Only | 2 - HP ProCurve Switch 2810, 24 1GbE Ports each, 48 1GbE ports total, Internal cluster connectivity |
| Form Factor | 42U |

HP X9700 Expansion Rack

Rack Model HP 10642 Universal G2 Rack (42U), Added to orders of more than 4 Capacity Blocks

For more information including details on rack stabilization options:
<http://h18004.www1.hp.com/products/servers/proliantstorage/racks/10000series-g2/index.html>

PDU's 4, model varies by region and choice of single phase or three phase,
 HP 32A HV Core Only Corded PDU (252663-B33)
 HP 24A HV Core Only Corded PDU (252663-D74)
 HP 40A HV Core Only Corded PDU (252663-D75)
 HP 3PH 24A NA Mod PDU (AF512A)
 HP 3PH 16A INTL Mod PDU (AF513A)

Form Factor 42U

Management Features The Management Server provides management of the X9000 storage system and can be accessed via web browser.

HP ProLiant Onboard Administrator, powered by the Integrated Lights-Out 3 management processor simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration. It functions without additional software, and can be accessed from any location via a web browser.

Management Server For additional information, please see: www.hp.com/go/iLOHP X9720 Network Storage Systems require a Management Server to support cluster operations. The Management Server software can be run on a dedicated Blade Server or on a non-dedicated Blade Server also acting as a file serving node. For X9720 environments a dedicated Management Server is recommended. More than one Management Server (dedicated, non-dedicated or combination) can be configured for high availability purposes. The default configuration includes 3 Blade Servers, one dedicated as a Management Server and two dedicated as file serving nodes and configured as an HA pair. It is recommended all new cluster configurations include one Blade Server to be used as a dedicated Management Server and all file serving Blade Servers be ordered in HA pairs. Non-dedicated and HA Management Server configurations need to be coordinated with the installer. If the X9720 will be added to an operating X9000 cluster an additional Management Server is not required.

NOTE: The non-dedicated Management Server software is included with all X9000 systems.



Standard Features – HP X9720 Network Storage System

Rack Airflow Requirements

Rack 10000 series Cabinets

The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors.

CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 5,350 sq cm (830 square inches) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).

Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 7 cm (2.75 inches)

CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

NOTE: For additional information, refer to the Setup and Installation Guide or the Documentation CD provided with the server, or to the server documentation located in the Support section at the following URL:

<http://h18000.www1.hp.com/products/servers/proliantdl145/index.html>

Telco and Threaded Hole Rack Support

Telco Rack Kit:

NOTE: Support for all 2-post Telco racks requires the use of the standard rack kit and an additional option kit from Rack Solutions: <http://www.racksolutions.com/hp>

Configuration Instructions - HP X9720 Network Storage System

Introduction

Configuring and ordering an HP X9720 Network Storage System is a simple process. The ordering tools are pre-populated with built-in rules to ensure your X9720 system is properly configured. You will only need to specify the number of Blade Servers, the number and type of Capacity Blocks, and any system options required. The ordering system will build the appropriate X9720 storage solution.

HP X9720 Series Network Storage Systems

| | | |
|------------------------------|-----------------------------------|---|
| Common Specifications | OS and File System | RedHat Enterprise Linux 5.5 64-bit X9000 File Serving Software 5.6 with licensing for all features including: - Snapshots, file based (coming soon) - Data Retention/WORM (coming soon) - Policy Based Tiering - Continuous Remote Replication - Data Rebalancing |
| | Protocol Support | NFS, CIFS, HTTP, HTTPS, FTP, FTPS and NDMP |
| | Optical Drive | DVD-RW standard for QuickRestore disaster recovery |
| | Remote Access | HP ProLiant Integrated Lights-Out 3 with Advanced Pack license |
| | Server Blade Platform | HP ProLiant BL460c G7 http://h18004.www1.hp.com/products/quickspecs/12518_na/12518_na.html |
| | Capacity Block Platform | HP X9000 Smart Array Systems |
| | Form Factor (Configurable) | From 1 or 2 dedicated 42U racks |
| | Factory Racking | All X9720 systems ship factory racked. Factory racking of X9720 systems with other HP products including other X9000 series systems, HP ProLiant Servers and HP storage arrays is not supported. |

There are three configurable components used in a X9720 system:

HP X9700 Blade Server
HP X9700 82TB Capacity Block
HP X9700 164TB Capacity Block

In addition to the three configurable components all new systems automatically include a base rack and a performance chassis. Systems with more than 4 capacity blocks also automatically include an expansion rack.

Step 1 Select the Power Configuration (Single Phase or Three Phase)

Two power configurations are available for the X9720, single phase or three phase. The order default is single phase. The X9720 power configuration must match the facility power configuration. The facility power requirements are detailed in Step 3. PDU's are included with the system and are based on the order region.

Configuration Instructions - HP X9720 Network Storage System

Step 2 Choose the Number of 82TB Capacity Blocks Required (min 0, max 8)

The minimum system includes (1) 82TB Capacity Block (AW551A) or (1) 164TB Capacity Block (AW598B). Storage capacity can be increased by adding 82TB or 164TB Capacity Blocks (AW551A or AW598B). The maximum number of Capacity Blocks is (8). Any combination of 82TB or 164TB Capacity Blocks can be used.

NOTE: For proper operation of the system a minimum of two Performance Blocks are required for each 164TB Capacity Block ordered. The ratio of two Performance Blocks per Capacity Block is also recommended for each 82TB Capacity Block ordered with the system

HP X9700 82TB Capacity Block

AW551A

Step 3 Choose the Number of 164TB Capacity Blocks Required (min 0, max 8)

The minimum system includes (1) 82TB Capacity Block (AW551A) or (1) 164TB Capacity Block (AW598B). Storage capacity can be increased by adding 82TB or 164TB Capacity Blocks (AW551A or AW598B). The maximum number of Capacity Blocks is (8). Any combination of 82TB or 164TB Capacity Blocks can be used.

Note: For proper operation of the system a minimum of two Performance Blocks are required for each 164TB Capacity Block ordered. The ratio of two Performance Blocks per Capacity Block is also recommended for each 82TB Capacity Block ordered with the system.

HP X9700 164TB Capacity Block

AW598B

Step 4 Select the Number of Blade Servers Required (Min 2, Max 16)

The default configuration includes 3 Blade Servers, one dedicated as a Management Server and two dedicated as file serving nodes and configured as an HA pair. The maximum number of Blade Servers is (16). It is recommended all new cluster configurations include one Blade Server to be used as a dedicated Management Server and all Blade Servers be ordered in pairs for HA configuration.

HP X9700 Blade Server

AW550C

Options - HP X9720 Network Storage System

Step 5 Add the System Options

The following options are available for X9720 Network Storage Systems. For more information on X9000 compatibility with HP and non-HP hardware and software please visit the Single Point of Connectivity Knowledge (SPOCK) website: <http://h20272.www2.hp.com/>

Add 10 GbE Cables and Transceivers

Network connectivity for the X9720 is provided by redundant HP Virtual Connect Flex-10 10Gb Ethernet Modules. 10 GbE connections require either Direct Attach Cable (DAC) for copper environments or fiber transceivers and cables for fiber-optic environments. Typically fiber-optics are used for 10 GbE connectivity.. The type of fiber transceiver depends on the facility network setup. If the facility does not already have the required transceivers available at the site, then the correct transceivers should be ordered, options include:

- HP BLc 10Gb SR SFP+ Opt (455883-B21)
- HP BLc 10Gb LR SFP+ Opt (455886-B21)
- HP BLc 10Gb LRM SFP+ Opt (455889-B21)
- HP BLc VC 1Gb SX SFP Opt Kit (453151-B21)
- HP BLc VC 1Gb RJ-45 SFP Opt Kit (453154-B21)

NOTE: One 453154-B21 is included with each Virtual Connect module for system interconnect purposes. Each Virtual Connect module can hold an additional 6 transceivers. At least two additional transceivers are required, 1 Per VC Module, to connect the system to the site network.

For more information on HP Virtual Connect Flex-10 10Gb Ethernet Module networking and related connectivity options see the QuickSpecs: http://h18004.www1.hp.com/products/quickspecs/13127_div/13127_div.html

Add Spare Disk Drives

| X9720 LFF (3.5") | Large Form Factor (LFF) X9720 Hard Drives | |
|------------------|--|------------|
| | HP 1TB 7.2k DP MDL SAS (Hot Plug) | 461137-B21 |
| | HP 2TB 7.2k DP MDL SAS 1y Wty HDD (Hot Plug) | 604081-001 |

X9720 System Environmental Specifications

| Base Rack | Minimum Base Rack Configuration (with 2 Blade Servers, 1 82TB Capacity Block): | Maximum Base Rack Configuration (with 16 Blade Servers, 4 164TB Capacity Blocks): | Each Blade Server | Each 82TB Capacity Block | Each 164TB Capacity Block |
|-------------------------|--|---|-------------------|--------------------------|---------------------------|
| | | | | | |
| Current - Amps (240VAC) | 10.7 | 50.7 | 0.9 | 6.8 | 8.6 |
| Max Power - Watts | 2,450 | 11,563 | 200 | 1,553 | 1,967 |
| Typical Power - Watts | - | - | - | - | 1,070 |
| Max Thermal - btu/hr | 8,357 | 39,447 | 682 | 5,297 | 6,710 |
| Weight - lbs | 1,159 | 2,459 | 14 | 368 | 368 |
| Weight - kg | 526 | 1,115 | 6 | 167 | 167 |

Options - HP X9720 Network Storage System

| Expansion Rack | Minimum Exp Rack Configuration (with 1 82TB Capacity Block): | Maximum Exp Rack Configuration (with 4 164TB Capacity Blocks): | Each Blade Server | Each 82TB Capacity Block | Each 164TB Capacity Block |
|-------------------------|--|--|-------------------|--------------------------|---------------------------|
| Current - Amps (240VAC) | 6.8 | 34.2 | 0.9 | 6.8 | 8.6 |
| Max Power - Watts | 1,553 | 7,866 | 200 | 1,553 | 1,967 |
| Typical Power - Watts | - | - | - | - | 1,070 |
| Max Thermal - btu/hr | 5,297 | 26,839 | 682 | 5,297 | 6,710 |
| Weight - lbs | 773 | 1,877 | 14 | 368 | 368 |
| Weight - kg | 351 | 852 | 6 | 167 | 167 |

Facility Power Requirement (Per Rack, available under raised floor)

North America/Japan: 4 x 50A (40A useable) , 200-240VAC, Single Phase Circuits
 Facility Power Receptacle: Non-NEMA CS8264C 50A or equivalent
 Or
 4 x 30A, Three Phase 200-240V Circuits
 Facility Power Receptacle: NEMA L15-30R

International: 4 x 32A , 200-240VAC, Single Phase Circuits
 Facility Power Receptacle: IEC60309 2 pole, 3 wire, 200-240VAC, 32A
 Or
 4 x 16A , 380-415v 3Ø Wye, Three Phase Circuits
 Facility Power Receptacle: IEC60309 4 pole, 5 wire, 220/380, 240/415V

NOTE: Some X9720 configurations can be supported with only 2 power circuits per rack while still maintaining power redundancy. The base rack can support up to 4 Blade Servers and up to 2 capacity blocks powered with 2 circuits. The expansion rack can support up to 4 capacity blocks powered with 2 circuits. Expansion beyond these limits requires the addition of 2 power circuits to the appropriate rack.

Standard Features - HP X9300 Network Storage System

Gateway File Serving Node HP ProLiant DL 380 Generation 7 (G7)
http://h18004.www1.hp.com/products/quickspecs/13595_div/13595_div.html

Processor / Cache Two Intel® Xeon® Processor E5620 (2.40 GHz, 12MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)

Memory 48GB (12 x 4GB) HP 4GB 1Rx4 PC3-10600R-9 Registered

| Expansion Slots | Slot number | Bus Type | Connector width | Bus number | Form factor | Notes |
|-----------------|-------------|----------|-----------------|------------|-------------|------------------------------|
| | 1 | X8 PCI-e | X16 | 7 | FL/FH | |
| | 2 | X4 PCI-e | X8 | 10 | HL/FH | |
| | 3 | X4 PCI-e | X8 | 13 | HL/FH | |
| | 4 | X8 PCI-e | X16 | 16 | FL/HH | Reserved for 10GbE or IB NIC |
| | 5 | X4 PCI-e | X8 | 20 | HL/HH | |
| | 6 | X4 PCI-e | X8 | 23 | HL/HH | |

| Network Ports | Model | 1 GbE Ports | 10 GbE Ports | Infiniband Ports |
|---------------|--|-------------|--------------|------------------|
| | HP X9300 1GbE Network Storage Gateway (AW539C) | 8 | 0 | 0 |
| | HP X9300 10GbE/IB Network Storage Gateway (AW540C) | 4 | 2 or | 2 |

NOTE: Each Gateway comes with 4-1 GbE ports for connectivity to the private cluster network. All other ports are intended for connectivity to the customer data network.

Power / Cooling Redundant hot plug replaceable power supply and fan modules in all servers and disk enclosures.
 2 high voltage power cords (IEC C13 to C14) standard per server and disk enclosure.

NOTE: X9000 series Network Storage Systems are primarily connected to PDUs in racks, so they ship standard with only PDU C-14 to C13 power cord(s). However, alternative power cords and power connectivity options exist. See the ProLiant DL Server and MSA array QuickSpecs on hp.com for additional information on available options.

HP X9300 Network Storage Gateways are designed to be connected to a SAN or storage array by adding a recommended Fibre Channel or SAS HBA, or by using an iSCSI initiator.

Host Bus Adapter (HBA) Support HBA selection is left as your choice based on existing infrastructure and/or desired array support. Please see compatible HBAs listed in the 'Options' section below.

NOTE: See the following URL for additional information about Fibre Channel HBAs:
<http://h18006.www1.hp.com/storage/saninfrastructure/hba.html>

Standard Features - HP X9300 Network Storage System

| | | |
|--------------------------------------|--|---|
| <p>HP SAN / Array Support</p> | <p>HP 3PAR Utility Storage</p> <p>HP LeftHand P4000 Storage Systems</p> <p>HP P2000 (SAS)</p> | <p>http://h18006.www1.hp.com/storage/highlights/3par.html NOTE: Array compatibility, does not include feature integration</p> <p>http://h18006.www1.hp.com/storage/highlights/lefthandsans.html NOTE: Array compatibility, does not include feature integration</p> <p>http://h18006.www1.hp.com/storage/disk_storage/msa_diskarrays/index.html NOTE: Array compatibility, includes integrated snapshot feature</p> <p>http://h18006.www1.hp.com/products/storageworks/eva/index.html NOTE: Array compatibility, does not include feature integration</p> |
| | <p>HP Enterprise Virtual Array (EVA)</p> | |

HP X9300 Network Storage Gateways and third-party storage arrays/SAN interoperability statement

HP acknowledges that some third-party storage arrays/SAN environments have been successfully tested for interoperability with X9300 Gateway products. HP will provide support for the HP Gateway products when connected to third-party storage arrays, but HP will not provide support on third-party storage arrays/SAN unless specifically called out in an HP Support contract. HP may support the third-party SAN environment attached to HP Gateway product(s) when specifically under contract with HP, but that SAN coverage does not extend to supporting the SAN connectivity of the third-party array.

If you call HP Services and the problem is determined to be caused by a third-party storage array or the storage arrays' connectivity into a non-HP supported SAN, you will be directed to contact the third-party storage array supplier for support.

Management Features HP X9300 Management Server provides management of the X9000 storage system and can be accessed via web browser.

HP ProLiant Onboard Administrator, powered by the Integrated Lights-Out 3 management processor simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration. It functions without additional software, and can be accessed from any location via a web browser.

For additional information, please see: www.hp.com/go/iLO

X9300 Management Server

The Management Server provides services used by the storage system to maintain cluster membership, quota management, file namespace management and a web based graphical user interface. HP X9000 Network Storage Systems require a Management Server to support cluster operations. The Management Server software can be run on a dedicated server (AW547C) or the software can be run on one or more of the clusters file serving nodes.

A preconfigured dedicated Management Server is automatically added to all orders but can be removed if not needed. If the customer has an operating X9000 cluster with one or more Management Servers an additional server is not required. More than one Management Server (dedicated, non-dedicated or combination) can be configured for high availability purposes. You cannot configure or operate an X9000 cluster without a Management Server (dedicated or non-dedicated)

NOTE: The dedicated Management Server (AW547C) is sold separately. The non-dedicated Management Server software is included with all X9000 systems.

| | |
|-------------------|---------------------------------|
| Server Platform | HP ProLiant DL 360 G7 |
| Form factor | 1U rack optimized |
| NIC Ports | 6 x 1GbE |
| Power Supplies | 2 |
| Remote management | HP Integrated Lights Out (iLO3) |

Standard Features - HP X9300 Network Storage System

Rack Airflow Requirements

Rack 10000 series Cabinets

The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors.

CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 5,350 sq cm (830 square inches) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).

Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 7 cm (2.75 inches)

CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

NOTE: For additional information, refer to the Setup and Installation Guide or the Documentation CD provided with the server, or to the server documentation located in the Support section at the following URL:

<http://h18000.www1.hp.com/products/servers/proliantdl145/index.html>

Telco and Threaded Hole Rack Support

Telco Rack Kit:

NOTE: Support for all 2-post Telco racks requires the use of the standard rack kit and an additional option kit from Rack Solutions: <http://www.racksolutions.com/hp>

Configuration Instructions – HP X9300 Network Storage Gateway

Introduction

Configuring and ordering an HP X9300 Network Storage Gateway is an easy process. The ordering tools are pre-populated with built-in rules to ensure your X9300 order is properly configured. You will only need to specify the Gateway model based on the customer network connectivity, the storage interface cards and any system options required and the ordering system will build the appropriate X9300 Gateway solution.

HP X9300 Series Network Storage Gateways

| | | |
|------------------------------|--------------------|---|
| Common Specifications | OS and File System | RedHat Enterprise Linux 5.5 64-bit X9000 File Serving Software 5.6 with licensing for all features including: - Snapshots, file based (coming soon) - Data Retention/WORM (coming soon) - Policy Based Tiering - Continuous Remote Replication - Data Rebalancing |
| | Protocol Support | NFS, CIFS, HTTP, HTTPS, FTP, FTPS and NDMP |
| | Optical Drive | DVD-RW standard for QuickRestore disaster recovery |
| | Remote Access | HP ProLiant Integrated Lights-Out 3 with Advanced Pack license |
| | Gateway Platform | HP ProLiant DL380 G7 http://h18004.www1.hp.com/products/quickspecs/13595_div/13595_div.html |
| | Form Factor | 2U |
| | Factory Racking | Flexible factory racking is offered for the X9300. Factory racking for X9300 systems with other HP products such as additional X9000 series systems, HP ProLiant Servers and HP storage arrays is available based on the configuration. NOTE: #0D1 will appear after the part number on the sales order if HP factory integration is supported. |

Step 1 Choose a Gateway Model

The difference between the two Gateway models is the public network interface. The model ordered must have the network interface required to connect the X9300 to the customer's network.

| | |
|--|--------|
| HP X9300 1GbE Network Storage Gateway | AW539C |
| Includes 4-1GbE ports (HP NC364T) for connectivity to the customer's network | |
| HP X9300 10GbE/IB Network Storage Gateway | AW540C |
| Choose between 10GbE and Infiniband high bandwidth connectivity options when configuring the Gateway Provides 2 10GbE or IB ports for connectivity to the customer's network | |

NOTE: X9300 Network Storage Gateways should be implemented in pairs with storage shared between the gateways.

NOTE: All Gateway models include 4-1 GbE ports per node for connectivity to the X9000 cluster network.

Step 2 Select the Storage Interface

NOTE: The X9300 Gateway supports up to two storage interfaces. A minimum of one and maximum of two Host Bus Adapter (FC or SAS) or Network Adapter (iSCSI) MUST be selected when configuring the system. Network ports provided with the Gateway for connectivity to the cluster network and customer's network cannot be used for interfacing with iSCSI storage.

| | | |
|---------------------------------|--|------------|
| X9300 Storage Interfaces | HP SC08Ge HBA | 488765-B21 |
| | HP SC08e 6 Gb SAS HBA | 614988-B21 |
| | HP 82Q 8Gb Dual Port PCI-e FC HBA | AJ764A |
| | HP NC364T PCIe 4Pt Gigabit Server Adptr | 435508-B21 |
| | HP NC550SFP Dual Port 10GbE Server Adptr | 581201-B21 |

Configuration Instructions – HP X9300 Network Storage Gateway

Step 3 Model AW540C Only - Add Network Interface

NOTE: AW540C supports one expansion slot for interfacing the Gateway with the customer's network. One 10GigE or Infiniband interface adapter **MUST** be selected when ordering.

| | | |
|--------------------------|--|------------|
| X9300 | HP NC364T PCIe 4Pt Gigabit Server Adptr | 435508-B21 |
| Model AW540C | HP NC550SFP Dual Port 10GbE Server Adptr | 581201-B21 |
| Network Interface | QLogic 4X QDR IB PCI-e G2 HCA | 583211-B21 |
| | HP IB 4X QDR CX-2 PCI-e G2 Dual Port HCA | 592520-B21 |
| | HP IB 4X DDR CX-2 PCI-e G2 Dual Port HCA | 592521-B21 |

Options— HP X9300 Network Storage Gateway

Step 4 - Choose the System Options

The following options are available for X9300 Network Storage Gateways. For more information on X9000 compatibility with HP and non-HP hardware and software please visit the Single Point of Connectivity Knowledge (SPOCK) website: <http://h20272.www2.hp.com/>

Add More Memory

NOTE: All models come with 48GB standard and are expandable up to 72GB with the following option kit.

X9300

24GB Memory Upgrade (requires 6 of the following DIMMs)

HP 4GB 1Rx4 PC3-10600R-9 Kit

593339-B21

NOTE: All DDR3 memory option kits consist of one DIMM per kit. The 24GB upgrade requires that a quantity of 6 of this memory kit be ordered (3 DIMMS for each processor)

Add a Rack

X9300

Rack Options

The X9300 and X9320 support flexible factory rack-mounting options in either a standard 42U cabinet based on the HP 10000 G2 Series Rack or a choice of 42U extended, 36U and 22U heights.

The default rack selection for the X9300 and X9320 is the HP Universal Rack 10642 G2 Shock. The following options are automatically added to the order when factory rack integration is selected:

- TFT (Keyboard with integrated mouse and 1U 17 inch flat panel display)
- KVM server console switch
- KVM IP Console 8-pack interface adapter
- (2) HP E2910a1-48G Switch W/10-GbE Interconnect Kit

NOTE: Factory rack integration should be selected unless a plan has been established for integrating the HP X9000 Network Storage System into the customer's existing environment. If a rack is not included with the order a network switch will not be included for the internal cluster network. A switch will be required and should be added to the order unless it will be provided by the customer.

Options— HP X9300 Network Storage Gateway

Add 10 GbE Cables and Transceivers

X930010 GbE Cables and Transceivers

HP X9300 Network Storage Gateways with 10 GbE NIC's require Direct Attach Cables (DAC) for copper environments or fiber transceivers and cables for fiber-optic environments to connect to the facility network. There are multiple options and they must match the facility networking. If the customer does not already have the needed DAC's or fiber transceivers available at their site, then the correct ones should be selected. Up to two 10 GbE connections are supported per Gateway.

Without at least one DAC or fiber transceiver per Gateway you will not be able to connect the system(s) to the facility network. If additional 10 GbE interfaces have been selected for iSCSI storage connectivity then additional DAC's or fiber transceivers (up to two per interface) will need to be included.

For more information please see the HP NC550SFP Dual Port 10GbE Server Adapter QuickSpecs

http://h18000.www1.hp.com/products/quickspecs/13555_na/13555_na.pdf

Add a Power Cord

HP X9000 Network Storage Systems come standard with at least one rack (IEC-IEC) PDU power cord. If you wish to use wall outlet power instead, you can choose a country- or region-specific power cord.

X9300 Power Cords

| | |
|---|--------|
| HP 1.83m 10A C13-UL US Power Cord | AF556A |
| HP 1.83m 10A C13 China Power Cord | AF557A |
| HP 2.5m 10A C13-Argentina Power Cord | AF558A |
| HP 1.83m 10A C13 Brazil Power Cord | AF559A |
| HP 1.83m 10A C13 Korea Power Cord | AF560A |
| HP 1.83m 10A C13 Taiwan Power Cord | AF561A |
| HP 2.0m 10A C13 India Power Cord | AF562A |
| HP 2.5m C13 AU/NZ Power Cord | AF569A |
| HP 1.83m 10A C13 CH Power Cord | AF565A |
| HP 1.83m 10A C13 DK Power Cord | AF566A |
| HP 1.83m 10A C13 EU Power Cord | AF568A |
| HP 1.83m 10A C13 IL Power Cord | AF564A |
| HP 1.83m C13 IT/CL Power Cord | AF571A |
| HP 2m C13 Japan Power Cord | AF572A |
| HP 1.83m 10A C13 UK Power Cord | AF570A |
| HP 2.5m C13 ZA/IN Power Cord | AF567A |
| HP 1.83m 10A C13 NBR14136 Brazil Power Cord | AF591A |

Specifications – HP X9300 Network Storage Gateway

Standard Memory

DDR3 Registered (RDIMM) with ECC Capabilities

- 48GB (12 x 4GB)

Maximum Memory

- 36GB per processor, 72GB total (based on use of 4GB modules)

DDR3 memory population guidelines

Installation guidelines for additional memory are summarized below:

- X9300 / X9320
 - There are three (3) channels per processor; six (6) channels total
 - There are three (3) DIMM slots for each memory channel; eighteen (18) total slots
 - Memory channel 1 consists of the three (3) DIMMs that are closest to the processor
 - Memory channel 3 consists of the three (3) DIMMs that are furthest from the processor
- DIMM slots that are white should be populated first
- Use only Registered memory (RDIMMs)
- Do not install DIMMs if the corresponding processor is not installed
- If only one processor is installed in a 2CPU system, only half of the DIMM slots are available

For more information on memory configuration, consult QuickSpecs for the HP ProLiant DL380 G7 Server or the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator

Memory options:

Registered DIMMs (RDIMMs)

HP 4GB 1Rx4 PC3-10600R-9 Kit

NOTE: All DDR3 memory option kits consist of one DIMM per kit.

NOTE: 24GB memory upgrade should be ordered as a quantity of 6 of the memory kits.

X9300 System Environmental Specifications

| Specification | Each X9300 Gateway | Network Switches (2) | Mgmt Server (Optional) |
|--------------------------------|--------------------|-------------------------|------------------------|
| Max Current - Amps (240VAC) | 4.3 | 2.2 | 2.1 |
| Max Power - Watts | 824 | 210 | 504 |
| Max Thermal - btu/hr | 2,813 | 717 | 1,720 |
| Weight - lbs | 55 | 22 | 35 |
| Weight - kg | 25 | 10 | 16 |
| Form Factor - Units | 2U | 2U | 1U |

X9300

HP 750W Power Supply

Part Number - AC 750W PSU

512327-B21

X9300 Management Server

X9300 Management Server

HP X9000 Network Storage Systems require a Management Server to support cluster operations. The Management Server software can be run on a dedicated server or on a file serving node. A preconfigured Management Server is automatically added to all orders but can be removed if not needed. If the customer has an operating X9000 cluster with one or more Management Servers an additional server is not required. More than one Management Server (dedicated, non-dedicated or combination) can be configured for high availability purposes. You cannot configure or operate an X9000 cluster without a Management Server (dedicated or non-dedicated).

NOTE: The non-dedicated Management Server software is included with all X9000 systems.

| | | |
|-----------------------|-------------------------------|---|
| Specifications | OS and X9000 Software | RedHat Enterprise Linux 5.5 64-bit X9000 File Serving Software 5.6 Management Server |
| | Server Platform | HP ProLiant DL360 G7 http://h18004.www1.hp.com/products/quickspecs/13598_div/13598_div.html |
| | Processor | Intel® Xeon® Processor E5506 (2.13 GHz, 4MB L3 Cache, 80 Watts, DDR3-800) |
| | Memory | 8GB (2 x 4GB) |
| | Internal Controller | Internal Smart Array Controller P410i with internal SAS port for O/S drives |
| | Internal Storage | 2 x 300GB 6G SAS 10K 3.5" ENT hot-plug SFF HDDs (O/S mirror) |
| | Network Ports | 6 x Gigabit Ethernet (2x internal and 4x integrated NIC) |
| | Management Ports | 1 Integrated Lights Out (iLO3) port |
| | Server Expansion Slots | 2 x PCIe |
| | Form Factor | 1U rack optimized |

HP X9300 Management Server

Includes quad-port 1GbE NIC (HP NC364T) for connectivity to the cluster network

AW547C

Services and Support, Care Pack Information and Warranty

Warranty

HP X9000 Network Storage Systems come with a standard 3-3-3 warranty (3 years parts exchange, 3 years labor and 3 years onsite, next business day response). Software media is warranted to be free of physical defect for a period of 90 days from delivery.

Services Included with the Product One year of HP Software Support, standard 9x5 business hours (software advisory and remedial software telephone support, new version license rights, and media and documentation distribution service).

For increased uptime, productivity and ROI -HP Care Pack packaged services for Storage

These days, you need to get the most out of your storage investment-you can't afford not to. When you buy HP storage products and solutions, it's also a good time to think about what levels of service and support you may need. To help take the worry out of deploying, designing, maintaining, and managing your environment, we've designed a portfolio of service options that are as: flexible, reliable and scalable as your storage. Unlike storage-only vendors, we take a holistic approach to your entire environment, bridging storage, servers, blades, software and network infrastructures with our HP Care Pack packaged services for Storage.

Protect your business beyond the warranty

When it comes to robustness and reliability, standard warranties on today's computing equipment have matured just as the technologies have matured. Good news on some fronts-but also a source of potential problems and subsequent consequences that come from depending on standard warranties alone. Standard warranty protects against product defects and some causes of downtime- but not the business. By using a standard approach to warranty uplifts, such as HP Care Pack Services, you can reduce downtime risks and be more certain of operational consistency for both mission-critical and standard business computing. Simply put, HP Care Pack Services normalize the warranty of combined products - helping you proactively guard against unplanned downtime.

Extending warranties with HP Care Pack Services

For cost-effective upgrading or extending your standard warranty, HP Care Pack Services offer a suite of standard reactive hardware and software support services that are sold separately, or combined as with our Support Plus and Support Plus 24 services. The portfolio also provides a combination of proactive and reactive services, such as Proactive 24 Service and Critical Service. In addition, with HP Proactive Select we offer an innovative approach to service delivery that gives you the flexibility to acquire the specific proactive services you need today, then add services as your needs evolve. HP Proactive Select offers a broad set of technical or per-event type service options - including server, storage, and network, SAN device, and software, environment, installation and education services. Services that you can mix and match depending on your specific requirements, from preliminary planning and equipment delivery to installation, configuration, integration, and testing, through every level of ongoing support. Our HP Care Pack packaged services for Storage assures help when you need it most. And for many products, post-warranty HP Care Pack Services are available when your original warranty has expired.

HP Storage Services: Offering reliability, flexibility and value-just like your storage

HP Storage Services offers a full spectrum of customer care, from technology support to complex migrations to complete completely managed services. HP Factory Express provides customization, integration and deployment services for turnkey solutions. HP Education offers flexible, comprehensive training on storage networking, disk storage systems, and storage software to help your IT staff get the most out of your investments. And HP Financial solutions extend innovative financing and asset management programs to cost-effective buy, manage and eventually retire your older equipment.

HP Storage Services, the trusted business technology experts who manage your technology in action, because when technology works, business works. <http://www.hp.com/hps/storage>

NOTE: Care Pack Services availability may vary by product and country.

HP Care Pack Services are sold by HP and HP Authorized Service Partners:

- Services for customers purchasing from HP or an enterprise reseller are quoted using HP order configuration tools.
- Customers purchasing from a commercial reseller can find HP Care Pack Services at <http://www.hp.com/go/lookuptool>

Services and Support, Care Pack Information and Warranty

Recommended HP Care Pack Services for optimal satisfaction with your HP product.

Recommended Services

3-Year HP Support Plus 24

For a higher return on your storage investment, HP Support Plus 24 provides integrated hardware and software support services designed specifically for your technology. Available 24x7, this 3-year combined reactive support option delivers onsite hardware support and over-the-phone software support around-the-clock. Leverage the full strength of HP Technology Services - customers can trust the services professionals at HP to work collaboratively with them, putting our strategic and technical know-how to work across their entire infrastructure.

- Improve uptime with responsive hardware and software services
- Enjoy consistent service coverage across geographically dispersed sites
- Update HP software at a predictable cost
- Increase customer satisfaction-with no interoperability gaps

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6638EN.pdf>

HP Enterprise NAS Implementation Service

For smooth startup and better business outcomes, HP Enterprise NAS Implementation Service - provides implementation of HP Enterprise NAS in your storage environment.

- Allows your IT resources to stay focused on their core tasks and priorities
- Customized implementation to meet your business's configuration requirements
- Reduces implementation time, impact and risk to your storage environment
- Helps ensure a successful implementation for complex deployments by providing HP project management
- Helps you more effectively utilize HP product by knowledge gained from HP Service specialist during onsite delivery of the service

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA2-9419ENW.pdf>

HP Enterprise NAS Upgrade Service

The HP Enterprise NAS Upgrade service provides HP Installation of software upgrades that enables your HP NAS cluster to be upgraded safely and with minimal service interruption. The service provides onsite upgrades for customers not wishing to perform their own upgrade installation.

- Quickly realize productivity gains through professional installation and configuration of upgrades to your HP Enterprise NAS environment
- By engaging HP, customers' IT staff can stay focused on their core tasks and priorities, resulting in less impact to your business.

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA2-9424ENW.pdf>

Services and Support, Care Pack Information and Warranty

Optional HP Care Pack Services that will enhance your HP product experience.

Optional Services

5-Year HP Support Plus 24

As an alternative to our recommended support level, for customers who need to improve uptime with responsive 24x7 product support:

HP Support Plus 24 helps you increase performance and availability with comprehensive, consistent hardware and software services. Working with your IT team, HP Services engineers deliver onsite hardware support and over-the-phone software support around-the-clock 365 days per year. Service coverage encompasses HP products and selected multivendor hardware and software.

In addition, this convenient HP Care Pack packaged service makes software updates available to you at substantial savings.

Choose Support Plus 24 when you need to:

- Improve uptime with responsive hardware and software services available anytime
- Cost-effectively obtain expert 24x7 multivendor hardware and software support
- Enjoy consistent service coverage across geographically dispersed sites
- Update HP and selected third-party software at a predictable cost
- Take advantage of subscription savings on software updates

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6638EN.pdf>

eSupport

HP eSupport is a portfolio of technology-based services that assist you with managing your business environment - from the desktop to the data center.

Support Portal

The HP support portal provides one-stop access to the information, tools and services you need to manage the daily operations of your IT environment.

Features include:

- Access to self-solve tools (including search technical knowledge base)
- Efficient logging and tracking of support cases
- Collaboration with other business and IT professionals
- Download of patches and drivers
- Access to diagnostic tools
- Proactive notification of relevant information

Access to certain features of the support portal requires an HP service agreement. To access the support portal, visit: <http://www.hp.com/support>

Customer Technical Training

Consider education as an integral part of your strategy to get the best return on investment for your HP storage solution. HP offers a variety of training courses on storage software, networking, archiving and disk storage systems. Our classes are available in many delivery modalities from traditional instructor-led courses at one of our 80 training centers worldwide to on-site training customized to your needs or online. www.hp.com/learn/storage

HP Services Awards

HP Services continues to be recognized for service and support excellence by customers, partners, industry organizations and publications around the world. Recent honors and award reflect our services team's dedications, technical expertise, professionalism and uncompromising commitment to customer satisfaction. For a list of all our awards, please visit: <http://h20219.www2.hp.com/services/cache/433028-0-0-225-121.htm>

Services and Support, Care Pack Information and Warranty

**Additional Services
Information**

For more information about HP Care Pack Services for Storage, please visit:
<http://www.hp.com/hps/storage>

If you have specific questions, contact your local HP representative. Contact information for a representative in your area can be found at "Contact HP" <http://www.hp.com>

© Copyright 2011 Hewlett-Packard Development Company, L.P.
The information contained herein is subject to change without notice.

Windows is a US registered trademark of Microsoft Corporation. Intel is a US registered trademark of Intel Corporation.

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

For hard drives, 1 GB = 1 billion bytes. Actual formatted capacity is less.