







HP X9000 Network Storage Systems (NAS)

Never in history has the demand for increasing storage capacity been so extreme. It is estimated that storage requirements will increase by more than fifty percent by 2011. For data centers to keep up they will have to adjust to the demand, and do it quickly. In addition to storage requirements for the traditional data center, the latest Cloud technologies are increasing storage demands as well.

The HP X9000 Network Storage Systems (X9000) scale-out beyond traditional network attached storage in both capacity and performance. Designed to be extremely scalable, flexible, and cost-efficient, the X9000 deliver excellent performance and a modular storage infrastructure to accommodate unprecedented storage growth and performance. Central management will allow you to manage not just terabytes but multi-petabyte environments at the highest density available from HP. The pay-as-you-grow architecture and an all-inclusive feature set eliminate storage over-provisioning or expensive add-ons.

The HP X9000 Network Storage Systems are platforms you can use to design a next generation data center, including public, private, and hybrid Cloud solutions

X9320	X9320	X9720	X9300
			
Scale-out modules			
Optimized for performance	Optimized for capacity	Dense architecture with over 1.3 PB in 2 floor tiles	Flexible solution to use with existing SAN storage
Raw capacity 21.6 TB or 43.2 TB	Raw capacity 48 TB, 96 TB or 192 TB	Scale from 82 TB to 656 TB (1 TB MDL-SAS) or 164 TB to 1.3 PB (2 TB MDL-SAS)	Use with HP P2000, EVA, P4000, and 3PAR or third-party arrays and SANs
48 or 96 450 GB SAS Drives	48 or 96 1 TB or 2 TB MDL-SAS drives		

Configuration Assistance, Storage Network Visio's & Ordering

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Visit storagenetworks.com or contact Storage Networks directly to obtain detailed Visio network diagrams depicting how the HP NAS System products can be integrated into your infrastructure.

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HP X9320 Network Storage System

The HP X9320 Network Storage Systems (x9320) are highly available, scale-out storage solutions that will allow you to add performance- or capacity-based storage quickly and easily.

The HP X9320 Storage System offers you scalable performance and capacity—independently

Performance Block	<p style="text-align: center;">Module</p> <div style="border: 1px solid white; padding: 5px; margin-bottom: 10px;"> <p>Intel Xeon 5600 Increased performance, durability, and energy efficiency</p> </div>  <p style="text-align: center;">1 GbE, 10 GbE, InfiniBand Models</p>	<p style="text-align: center;">Specifications</p> <p>Dual Active Servers G7 Intel® Xeon E5620 (2.40 GHz, 12 MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) •2x Quad Core •48 GB's RAM (4GBx12)</p> <p>Network Adapters HP NC364T PCIe 4Pt Gigabit HP NC550SFP Dual Port 10 GbE HP IB 4X QDR CX-2 PCI-e G2 Dual Port HCA</p>
Capacity Block Starter Kit	 <p style="text-align: center;">14.4 TB, 24 TB, 48 TB Models</p>	<p>Array Starter Kit 6G Dual Active Controllers 24 HDD's 2 Storage Shelves</p> <p>Drives Supported 600 GB SAS Enterprise Drive 1 TB SAS ML Drive 2 TB SAS ML Drive</p>
Capacity Block Expansion Kit	 <p style="text-align: center;">14.4 TB, 24 TB, 48 TB Models</p>	<p>Storage Expansion 6G 2 Storage Shelves 24 HDD's</p> <p>Drives Supported 600 GB SAS Enterprise Drive 1 TB SAS ML Drive 2 TB SAS ML Drive</p>

The X9320 is extremely flexible. Some models optimize performance while others emphasize capacity. The different configurations use a combination of:

- 1 TB 3G Serial Advanced Technology (SATA) disk drive
- 600 GB 6G Serial-Attached SCSI (SAS) disk drive
- 1 TB 6G SAS disk drive
- 2 TB 6G SAS disk drive
- 1 Gigabit Ethernet (GbE) ports
- 10 GbE ports
- InfiniBand ports

HP X9720 Network Storage System

HP X9720 Network Storage System (X9720) serves and stores hundreds of terabytes or petabytes of file-based data for your expanding applications. Designed to be extremely scalable, affordable and easy to manage, the X9720 delivers excellent performance and availability for service providers and enterprise data centers alike. Its ability to scale beyond traditional storage systems in both capacity and performance enables scalability





up to a maximum configuration of sixteen HP BladeSystem server blades with up to 128 CPU cores per unit for an astounding 3.2 GB per second of raw performance with up to 1312 TB of storage. The central management interface will allow you to manage not just terabytes but multiple petabyte systems. And it is highly affordable-with both low overall acquisition costs and low operational costs.

The HP X9720 Storage System can scale to extreme capacities

Extreme Scalability

- Ability to scale performance and capacity independently
- Starts at 82 TB and non-disruptively scales to 1312 TB

Unified Manageability

- System configuration/control from single management interface
- Instead of TB/administrator, simplified management enables PB/administrator

Extreme Affordability

- Archives can now be moved to more affordable content on demand system
- Lower acquisition cost



The maximum system configuration consists of two 42U racks which include an HP BladeSystem coupled with innovative new storage components combined with software which makes it easy to setup and use. The 12.8 cores per U of performance, 12 TB per U of storage capacity and software delivers ease of use and supports multiple use cases.

The X9720 offers you quick upgrades of storage capacity and/or performance by simply adding capacity blocks or blade servers of the needed resource.

X9720 Capacity Blocks

Capacity blocks are units of storage for the X9720. They consist of eighty-two drives in 7U rack space, are RAID 6 protected and have dual SAS controllers. The X9720 capacity blocks come in 82 TB and 164 TB capacities using 1 TB or 2 TB SAS Midline drives.

A capacity block is added without downtime simply by installing the unit into the rack, plugging in two cables and entering a simple command that brings the storage online and into the system.



X9720 Capacity Blocks



Disk Drives

- 1 TB or 2 TB 7200 RPM 6G Dual-Port SAS Midline
- Standard HP carriers
- Hot Swappable

- 82 drives in 7U
- Dual-Redundant Active- Active Controllers
- Redundant 3Gbit SAS Connect
- Eight 8+2 RAID 6 groups, 2 hot spares, ~78% storage efficiency

X9720 Server Blade

The Server Blade utilizes HP's industry-leading BladeSystem c7000 enclosure. The system starts at a 3 blade server configuration and can be expanded to 16 blades. This can provide you up to 12.8 cores/U of rack space.

The X9720 Server Blade



Blade Server

- Dual Quad Core Intel Xeon Processors
- Two Internal 2.5-inch 300 GB 10K SAS drives
- Dual 10 Gb NICs (PCA)
- Dual 3 Gb/sec SAS Connections (Mezzanine Slot)
- 24 GB Memory

Chassis

- 16 Blade Server Bays, 10U
- 8 Interconnect Bays
- Integrated NC553i Dual Port FlexFabric 10Gb Adapter provides 2 - 1/10 GbE ports exposed through the Server Chassis Virtual Connect modules
- HP ProLiant Onboard Administrator, powered by the Integrated Lights-Out 3 management processor



HP X9300 Network Storage Gateway

The X9300 Network Storage Gateway is flexible, scale-out solution that brings feature rich gateway file services to HP Modula Smart Array, HP Enterprise Virtual Array, HP 3PAR



Systems, HP P4000 SAN Solutions, or 3rd party arrays or SANs for those customers experiencing considerable unstructured data growth.

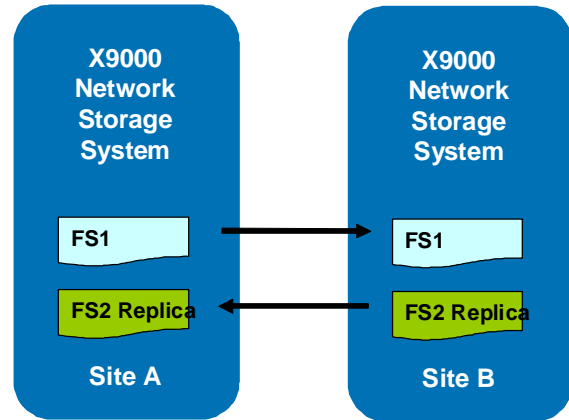
Integrated Remote Replication

All X9000 Network Storage Systems offer integrated remote replication for disaster recovery.

Integrated remote replication offers you a disaster recovery solution at no extra costs

Integrated Replication

- Ideal for any file based Disaster Recovery
- No additional cost
- Scalable performance for faster replication
- Reduce solution cost
- Less time to replicate
- Scale with confidence
- Access storage from both sites



The X9000 integrated replication offers [CustomerName]:

- Continuous Remote Replication
- Parallel Replication—all servers used
- File based Replication
- File System accessible on remote site
- Recover from loss of WAN/LAN connection
- Pause/Resume feature
- Provide a copy of the data for Disaster Recovery to a second site
- Reduced recovery time after a disaster
- Local convenience copy for faster READ access at the second site
- The second site is also an active file system allowing access to files, unlike existing DR solutions which are active-passive
- Continuous replication allows data to remain up-to-date at all times
- Simplifies disaster recovery and reduces downtime
- Allows for a low RPO/RTO
- Parallel replication across multiple segment servers using the patented IBRIX segmented architecture
- Allows for fast data transfer of large amounts of data
- Balances the load across servers
- Tracks changes on the source file system and continuously replicates these changes to the target file system ASAP
- Each segment server replicates the changes in parallel and independently
- One cluster can have multiple source file systems
- 1-to-1 mapping of file systems from one cluster to another
- A file system on a cluster can either be the source or target
- One to many site replication



Data Tiering

The X9000 Network Storage Systems allows data tiering in a single namespace.

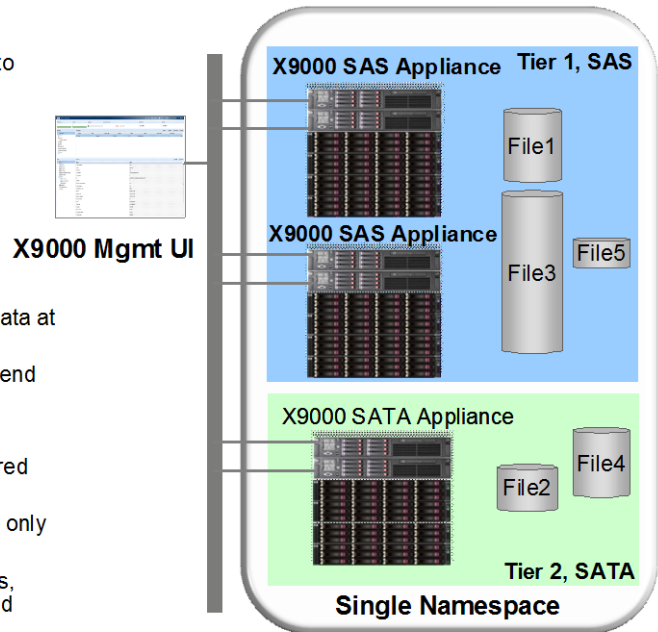
The X9000 offers you the advantages of high-performance storage where it is needed and the advantages of cost effective tier 2 storage—all in the same namespace

Functionality

- Migrate files from one tier of storage to another within the same namespace
- Policy based trigger of file movement
- Scheduled activity performed in the background by the system

Business Benefit

- Data is always online and available
- Quickly and easily access the older data at any time
- Data movement is transparent to the end user
- No change in the directory location
- Automated once the policy is configured
- Reduce costs by moving infrequently accessed data to slow tiers and store only the “hot” data on faster tiers
- Optimize the use of storage resources, improve overall storage efficiency, and reduce TCO



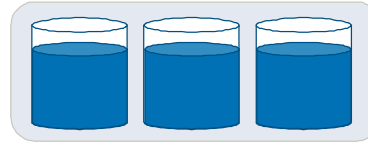
File System Rebalancing

Adding capacity to a storage system is only part of the solution when the existing file system approaches maximum. The X9000 Network Storage Systems will allow you to increase file system and it will automatically rebalance the file system to provide maximum performance.

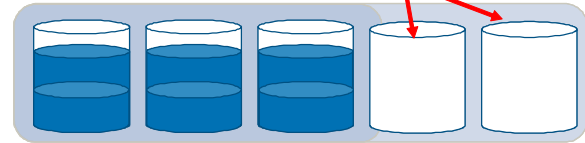
Functionality

- Dynamic, non-disruptive redistribution of data across physical storage elements to provide balanced storage utilization

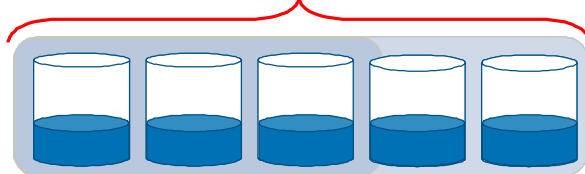
Existing file system approaching capacity



Add storage to existing file system



Distribute active file system across all available storage to insure efficient utilization



Business Benefit

- Improves performance by avoiding hot-spots on existing storage or when new storage capacity is added
- Improves storage procurement process through efficient utilization for existing storage
- Lowers administrative overhead and operational costs by automating rebalancing

Software Snapshots

Software Snapshot is a versioning file system that will allow you a continuous and real time view of the past giving users access to the file system as it appeared at the instance of the snapshot.

Snaps can include complete file systems, directories, and files and are read-only and immutable. In addition, snaps allow recovery of files in event of deletion or for backup purposes. Also, they can be replicated using CRR (Remote Replication)

Write Once, Read Many Support

Write-Once, Read-Many (WORM) data-protection feature offers a simple and secure method for archiving records as part of a compliance solution to meet the toughest of industry regulations.

WORM applies across the filesystem namespace. You can have one file system with WORM and another without. When a filesystem is declared WORM, old snapshots can be deleted.

Furthermore, the X9000 Network Storage Systems provide Data Validation that computes and saves the checksum for each file and allows for periodic data verification.

HP Insight Control

The X9000 Network Storage Systems are built on HP ProLiant G7 technology that includes HP Integrated Lights-Out 3 (iLO 3). iLO 3 delivers turbo-charged performance with remote console operation. iLO 3 also supports Integrated Platform Management Interface (IPMI) and Data Centre Management Interface (DCMI) standards and delivers high-performance hardware-based Advanced Encryption Standard (AES) encryption.



HP Insight Remote Support

HP Insight Remote Support provides you secure remote support so you can spend less time solving problems and more time focused on your business. You can have your systems remotely monitored for hardware failure using secure technology that has been proven at thousands of companies around the world. In many cases this can avoid problems before they occur.

HP Insight Remote Support Advanced fully integrates into HP Systems Insight Manager. It provides comprehensive remote monitoring, notification/advisories, dispatch and proactive service support for nearly all HP servers, storage, network, and SAN environments, plus selected Dell, Sun, and IBM Windows servers that have a support obligation with HP. It also enables HP to deliver higher levels of proactive support in line with HP Mission Critical Services support agreements.

HP X9000 Standard Features and Benefits

- **Scalable infrastructure reduces time and cost**—scale performance and capacity without having to reboot the system, making upgrades easy and seamless. The ability to scale capacity or performance quickly and easily, as needs arise, reduces the time and cost previously required to have new systems up and running.
- **Single namespace for easy management**—increases capacity utilization and simplifies management with a single namespace that can scale to 16 petabytes.
- **Scale bandwidth and application performance online**—fully distributed metadata provides breakthrough performance for both data intensive and transactional applications.
- **Supports all major file protocols concurrently**—consolidate Windows, MAC, Linux, and UNIX file data in a single, managed pool of storage, regardless of protocol (CIFS/NFS, HTTP/S, FTP/S and NDMP). In addition, the X9000 includes a native SMB implementation for faster and more secure Windows file serving workloads.
- **On-the-fly storage rebalancing**—respond to rapidly changing business needs by evenly distributing files across the storage to eliminate hotspots and ensure performance level is maintained.
- **High availability and dynamic load balancing**—system redundancy and automatic detection of hardware and software failures provides consistent availability, while dynamic load balancing ensures hotspots are reduced and data is always available.
- **Site level protection for disaster recovery**—continuous remote replication between geographically dispersed sites which reduces risk of business outage and costly downtime.
- **Full featured appliance lowers acquisition costs**—comes as a complete scale-out NAS appliance fully configured with a rich feature set that includes a single namespace, rebalancing, continuous remote replication, policy management, and data tiering.
- **Easy-to-use central management interface**—the X9000 management server enables a single point for system configuration and control, which includes monitoring health status, performance utilization, file system expansion, and server and storage capacity. The management software does not require a dedicated server.
- **Data tiering optimizes storage efficiency**—built-in policy management and automated file migration which reduces cost by moving less active data from higher





cost storage to more affordable storage, thus lowering operational costs and improving overall storage efficiency.

- **Modular pay-as-you-grow architecture**—multi-tiered storage eliminates costly over-provisioning which allows you to more easily match the storage system to your business requirements.
- **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.

Warranty and Services

The HP X9000 Network Storage Systems come with an HP Global Limited Warranty and Technical Support, which includes:

- Three Years Warranty Parts Replacement
- One Year Next Business Day On-site Warranty Service
- Customer Self Repair for Select Parts
- One Year 9x5 Technical Phone Support
- Online Business Support Center and IT Resource Center





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