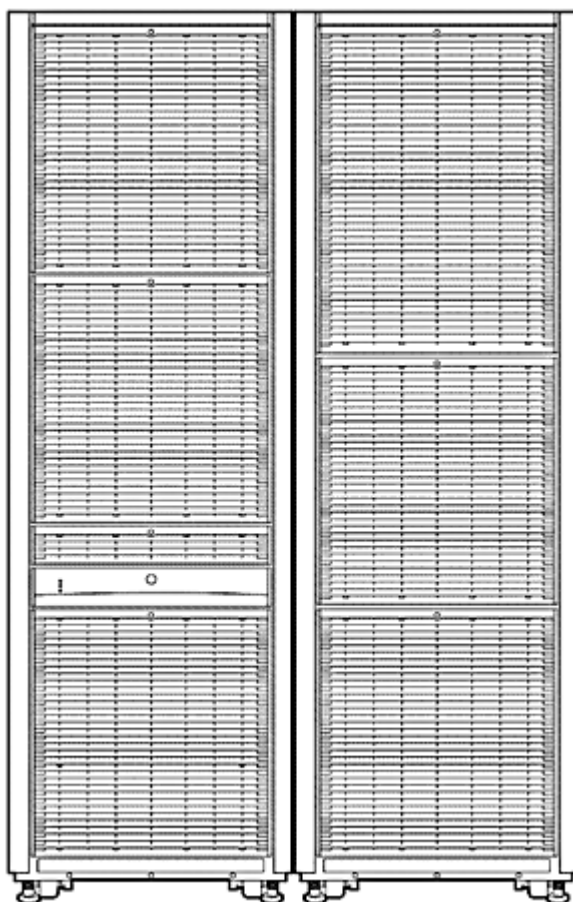


Overview

As an entry-level high-end array, the HP StorageWorks XP10000 Disk Array delivers "always-on" availability for mission-critical IT environments. Boot-once scalability and heterogeneous connectivity in a compact footprint increases business agility and decreases the stress of running applications where downtime is not an option. The XP10000 is designed for organizations that demand the most from their storage. No single-point-of-failure and non-disruptive online upgrades ensure that data is always available.

Outstanding random and sequential performance is ideal for database, OLTP, Oracle, SAP, and Exchange workloads. Advanced virtualization technology simplifies the lifecycle management of data in heterogeneous SAN environments by supporting up to 16 Petabytes of external storage—all of which can be managed from one single pane of glass. Flexible secure array partitioning eases management, while array-to-array local and remote data copying enables multi-site disaster tolerance. World-class service and support for IT environments meets the most demanding needs.

In a world where every business decision triggers an IT event, the XP10000 enables an adaptive enterprise—one that can quickly capitalize on and manage change. The breadth and value of the XP10000 capabilities ensure the ability to demand more agility for adapting to real-time business needs. Information is protected and available by uncompromised simplicity through consolidation and management efficiencies.



Overview

What's New

Functionality Element	XP10000
400 GB FC 10K rpm	The XP24000 and XP20000 disk arrays now support a higher capacity Fibre Channel (FC) disk drive.
4 Gb/sec disk drives	This drive increases the overall capacity internal to the array for tier 1 type storage needs.

Key Features and Benefits

HP StorageWorks XP10000 Disk Array delivers "always-on" availability for mission-critical IT environments. Boot-once scalability and heterogeneous connectivity in a compact footprint increases business agility and decreases the stress of running applications where downtime is not an option. The XP10000 also supports a large number of operating systems and offers very robust solutions.

Reliability

Extreme reliability means never losing any data, no matter what happens.

- The XP10000 provides "always-on" reliability with no single-point-of-failure and redundant hot-swappable components, including: disk drives, fans, processors, I/O interfaces, power supplies, batteries and control processors.
- This redundancy is further enhanced by the inherent RAID technology, which includes RAID 6 (6D+2P) that allows up to two disk drives of eight to fail and still maintain data availability.
- The XP10000 is also connected to HP's "Storage Technology Center" and is constantly being monitored by HP for any potential issues, so they can be proactively addressed before they can cause a problem.

Availability

Continuous availability is a vital requirement for most companies today. The costs associated with system downtime are skyrocketing. The XP10000 enables 24×7 operation in several ways:

- RAID technology and redundant data paths ensure that there is no single point-of-failure, virtually eliminating the likelihood of unplanned shutdown. If one of the two data paths fails, the other path takes over automatically. HP's "Storage Technology Center" is alerted to any problem, and that problem is quickly fixed with a minimum of stress while all data remains accessible.
- The XP10000 offer a painless growth path; it can be upgraded without ever taking the system down, so you can add capacity as required without disrupting business operations. In addition, HP's management software makes it easy to manage several additional arrays from a single console, so your storage capacity can grow without increasing demands on administrative staff.
- Integration with Business Copy XP and Continuous Access XP data replication software; as well as Cluster Extension XP and many 3rd party clustering software utilities enable continuous operation over multiple sites to protect against a local disaster.
- In case you need to restore data after a physical disaster, data replication techniques of HP's Business Copy XP and Continuous Access XP software with full integration within HP OpenView Data Protector backup management software ensures that you can rapidly restore your data and return to normal operation quickly and efficiently.
- In case of power outages data is protected in Cache or Shared Memory for at least 36 hours by nickel hydride batteries.

Scalability

The XP10000 allows you to start with the configuration you need today and scale up as your needs grow. Scales from 0 drives to 240 and to over 95 TB* of raw storage capacity inside a single array. This scalability permits organizations to accommodate constant growing storage needs without ever having to upgrade the box.

- Online upgrades allow for no interruptions to applications and never require a full-box/forklift upgrade

Overview

- 120 disk drives in the primary rack
- 120 disk drives in the second rack
- Over 95 TB of internal capacity, 16 PB of external capacity, 64 GB of Cache, and 6 GB of Shared Memory

	MIN	INCREMENT	MAX 1 rack	MAX 2 racks
Data Drives	0	4	116	236
Spare Drives	0	1	16	
Capacity	576 GB raw 288 GB usable	-	47 TB* raw 41 TB* usable**	95 TB* raw 83 TB* usable**
Cache	4/8 GB	4/8 GB	64 GB	
Shared Memory	1 GB	1 GB	6 GB	
CHIP Pairs**	1*	1	1	
Host Ports	16	8/16/32	48	
LDEVs	1	1	16,384	

* The capacity of disk drives, and therefore the data capacity of the disk array, is based on 1K = 1000, not 1024. These means that 1 GB = 1,000,000,000 bytes and 1 TB = 1,000,000,000,000 bytes.

** Usable capacity is determined by using a RAID 5 (7D+1P) configuration.

*** 16 Fibre Channel ports (1-4 Gbps) are included on the combination CHIP/ACP that is required for every XP10000. One additional CHIP of any type can be added to an XP10000.

Low Cost of Ownership

The XP10000 provides a low total cost of ownership when all factors are considered -- great price/performance ratio, increased productivity via higher throughput speeds, zero downtime, compact footprint to conserve floor space, and ease of management. In addition, connectivity to low cost external storage as well as the ability to consolidate proliferated storage allows you to more fully utilize storage assets and improve the quality of storage services that IT offers to the enterprise.

Virtualization

The XP10000 simplifies the management of heterogeneous SAN environments through its ability to support up to 16 PB of external storage-all configured 'behind' a single XP and managed from one single pane of glass. HP StorageWorks External Storage XP software uses advanced virtualization technology to allow storage administrators to host XP10000 Disk Array LUNs on externally attached disk arrays. In addition, no internal disks are required in the XP10000 in order to manage the externally connected storage arrays.

Instead of seeing a confusing collection of dissimilar arrays, host systems perceive all the data to be stored inside the XP disk array. In effect, the XP disk array becomes the storage controller for a flexible, multi-tiered collection of storage with a range of cost and performance capabilities. By configuring current or legacy storage systems behind a single XP10000, data can be moved back and forth dynamically across tiers, all of which is invisible to the applications.

The XP10000's virtualization feature also reduces the total cost of storage ownership by:

- Exploiting common storage management across multiple vendors' systems
- Easily deploying a dual-vendor policy
- Facilitating simpler and lower cost data migrations
- Increasing storage utilization
- Extending the life of legacy storage

Supported arrays include the HP StorageWorks MSA family of low-cost arrays, the HP EVA disk array family, the HP XP disk array family, and many current and legacy arrays from other storage

Overview

providers, including EMC, IBM, and HDS.

For a complete/up-to-date list of supported arrays and accompanying firmware versions, please contact your HP representative.

Consolidation

Consolidating storage onto the XP10000 allows companies to dramatically reduce the high maintenance of managing proliferated storage. Costs of hardware maintenance decrease by managing only one piece of equipment, not many, and by retiring aging equipment. Management costs, which can be 3 to 4 times the cost of hardware, can be reduced allowing one powerful point of management. And with increased asset utilization and efficiency through management of low-cost external tiered storage (such as an MSA connected as External Storage behind an XP), companies can buy less storage.

Performance

The XP10000 offers industry-leading performance through which customers can achieve outstanding levels of random I/O support for database, OLTP, data warehousing and other I/O intensive applications.

- Max Sequential Performance = 1.3 GB/s
- Max Random Performance Cache = 700,000 IOPS
- Max Random Performance Disk = 16,000 IOPS
- Max Random Cache Hit (single port) = 35,000 IOPS
- Max Data Bandwidth = 8.5 GB/s
- Max Control Bandwidth = 3.6 GB/s

Heterogeneous Connectivity

A wide variety of servers and operating systems can be connected to an XP disk array

- HP-UX
- Windows - W2K, 2003
- LINUX - IA2, Red Hat
- HP OpenVMS
- HP NonStop
- Mainframe
- HP Tru64 UNIX
- IBM AIX
- Sun Solaris
- Dynix PTX, NCR

The XP10000 can be connected through all popular host interconnections

- Fibre Channel
- FICON
- ESCON
- iSCSI

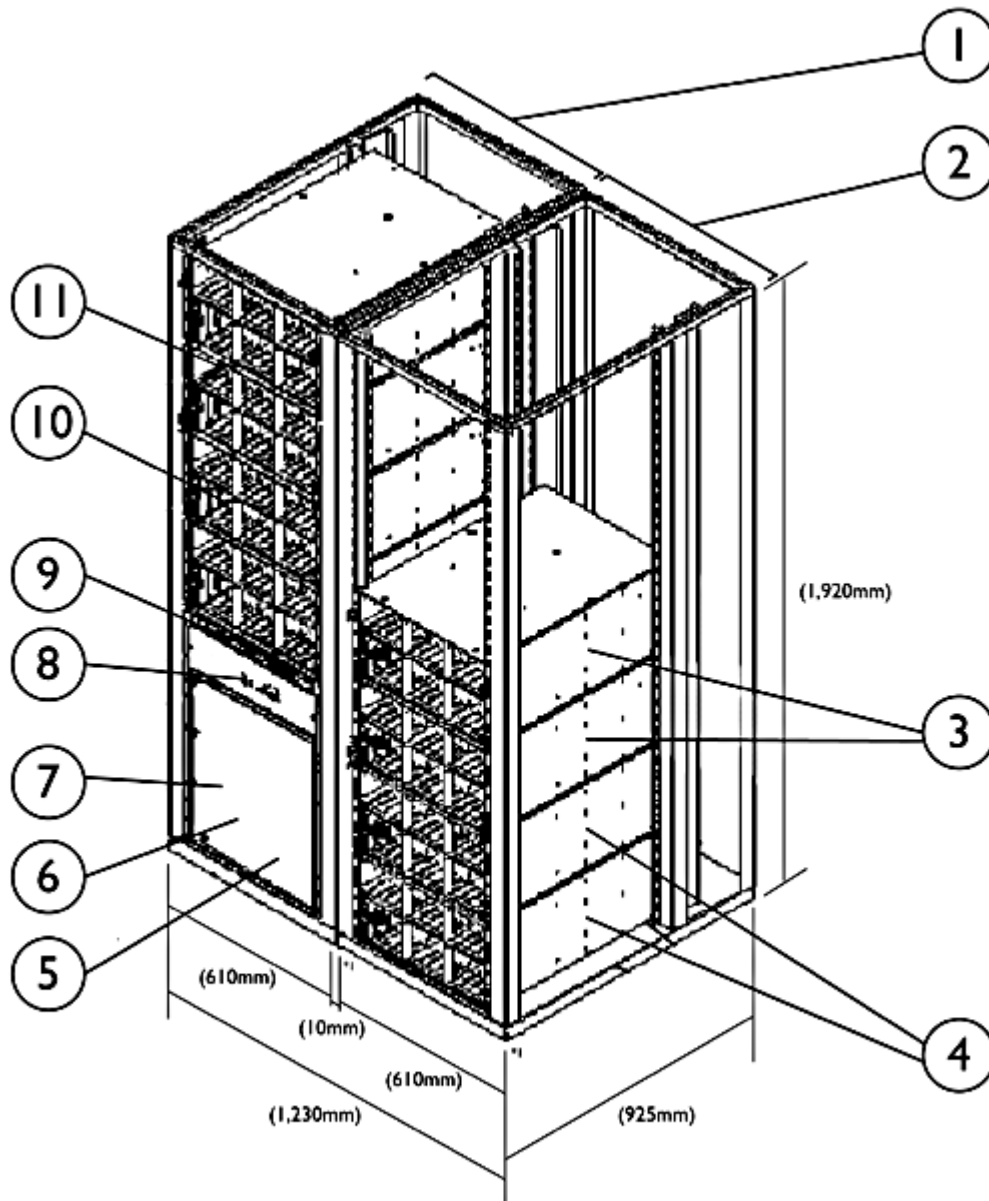
Redundancy

The HP StorageWorks XP10000 Disk Array is designed with no single point of component failure. It has full component and function redundancy, providing full fault tolerance for disk array processors, shared memory, cache, control and data connections, power supplies, cooling fans, and batteries. The XP has redundant power supplies with multiple connections to AC power from different sources, using single-phase in 50 or 60 Hz.

Manageability

Multiple arrays and hundreds of terabytes can be managed from a single web-based management station - by existing staff

Standard Features



*1: This includes the thickness of side covers (12.5mm x2)

- | | | |
|--------------------------|------------------|---------------------------|
| 1. Primary Rack | 5. Power Supply | 9. SVP |
| 2. Secondary Rack | 6. Battery Box | 10. Disk Chassis (DKU-R0) |
| 3. Disk Chassis (DKU-R3) | 7. DKC Box | 11. Disk Chassis (DKU-R1) |
| 4. Disk Chassis (DKU-R2) | 8. Control Panel | |

Standard Features

XP10000 Hardware	The XP10000 hardware consists of a primary rack that will hold up to 120 disk drives. This primary rack also contains the control panel, service processor (SVP), Cache Memory, Shared Memory, Crossbar Switch, Batteries, Client-Host Interface Processors (CHIPs), and Array Control Processors (ACPs). A second rack can be added that can hold up to 120 more disk drives.
XP10000 Software	A full complement of software tools are available for XP10000 Disk Array management, management integration, and to enable a wide range of High Availability solutions. Please see the "HP StorageWorks XP Disk Array Software Products" QuickSpecs for further information: http://h18000.www1.hp.com/products/quickspecs/12066_na/12066_na.html
Server connectivity	The XP10000 connects to a variety of servers and operating systems. For details on which servers and operating systems are currently supported, please contact your resellers and your HP technical support to review the supported server and operating system information.
Client Host Interface Processors (CHIPs)	Client Host Interface Processors (CHIPs) provide connections to host or servers that use the XP10000 for data storage (either directly connected to the servers or through SAN switches). The primary function of a CHIP is to process host commands and signal the ACPs to read or write Cache to or from the disk drives. In addition, CHIPs access and update the cache track directory, monitor data access patterns, and emulate host device types. The CHIPs are configured in pairs for redundancy. 16 ports of short-wave Fibre Channel 1 to 4 Gbps Auto sensing with Continuous Access support are included on the combination CHIP/ACP pair that is required for every XP10000. One additional CHIP pair of any type can be installed. CHIP pairs available for use in the XP10000 include: <ul data-bbox="409 1181 1329 1402" style="list-style-type: none">● 8, 16, and 32 port 2 Gbps auto sensing short-wave and long-wave Fibre Channel● 8, 16, and 32 port 4 Gbps auto sensing short-wave and long-wave Fibre Channel● 16 port ExSA Channel (ESCON compatible)● 8 port 2 Gbps auto-sensing FICON in both short-and long-wave versions● 16 port 2 Gbps auto-sensing FICON in both short-and long-wave versions● 16 port 4 Gbps auto-sensing FICON in both short-and long-wave versions● 8 port Gigabit Ethernet iSCSI CHIP pair *NOTE: The standard optical transceiver (small form-factor pluggable [SFP]) on the Fibre Channel CHIPs is short-wave. Long-wave SFP transceivers can be ordered individually. A single Fibre Channel port can be quickly converted from short-wave to long-wave by swapping a short-wave SFP transceiver for a long-wave SFP transceiver. Both 2Gbps and 4Gbps long-wave transceivers are available.
Array Control Processor (ACP)	The Array Control Processor (ACP) performs all data movement between the disk drives and Cache Memory. The ACP also provides data protection through the use of RAID 1, RAID 5, and RAID 6. The ACP blade has four 2 Gbps FC-AL loops, or 8 loops total per pair, and supports up to 60 disk drives per loop. The ACP is configured as a pair for redundancy. The XP10000 ACP is combined with a 16 port Fibre Channel CHIP.

Standard Features

Cache memory

The XP10000 supports up to 64 GB of Cache. Cache Memory is used to temporarily store data from the host until it is written to disk, or to stage data requested by the host from the disk. The XP10000 Cache Memory Modules are installed on Cache Platform Boards:

- Each Cache Platform Board pair supports up to 4 sets of 8 GB Cache Memory Modules (up to 64 GB for the pair).

Cache is configured as two sets of memories located in different power domains, into which data that is to be written on the disk is mirrored, so the data will not be lost even if a failure occurs.

XP Cache can also be allocated to particular host/port combinations to ensure that those hosts/ports enjoy optimized performance of Cache-oriented I/O. These cache partitions are assigned to specified disk array groups. Up to 16 partitions of at least 4GB can be created in an XP10000. Assigning cache in this way provides another method for tuning performance for data access for performance critical applications. Cache can be partitioned separate from storage partitions.

Shared memory

Shared Memory of up to 6 GB is independent of the Cache Memory and is used to store tables, side files, and other information, thus freeing up the Cache Memory for user data. Shared Memory is also used to store system configuration information. The configuration information includes system components mapping, LUN maps, Cache pointers, and RAID levels.

Switch support details

The XP10000 connects to the leading Fibre Channel switches in the industry today. For detailed information on supported switch configurations, please contact your sales representative.

Disk Drive Support

The number and type of disk drives installed in an XP10000 array is flexible. Disk drives must be added in groups of four. Additional capacity can be installed over time as capacity needs grow. All disk drives use the industry standard dual ported 2 Gbps Fibre Channel Arbitrated Loop (FC-AL) interface, except for the 400 GB disk drive which is 4 Gbps. Each disk drive is connected to both of the redundant ACPs in a pair by separate Fibre Channel arbitrated loops. Spare drives are automatically used in the event of a disk drive failure.

FC Disk Drives

The XP10000 supports 73 GB, 146 GB, 300 GB, and 400 GB Fibre Channel disk drives. FC drives are designed for a high capacity/high performance storage option within the array and for high priority applications such as OLTP, Oracle, SAP, and Exchange workloads.

Batteries

The XP10000's power fail strategy provides for environmental-friendly Nickel-Hydride batteries, which maintain system operation for up to 20 milliseconds during power outages and protect data in Cache and Shared Memory for at least 36 hours.

Standard Features

Software Components

Software Features

When disaster strikes, it can mean much more than a temporary loss of computing power. Work delays, data degradation, and data loss can quickly translate into lost revenue, lost profits, and lost customers. HP provides a range of solutions that address varying degrees of availability and scalability.

These solutions range from:

- Consolidation and Virtualization - External Storage XP, Tiered Storage XP, and Disk/Cache Partition XP
- Internal Mirrors - Business Copy XP
- Remote Mirrors - Continuous Access XP
- Path Management - Auto Path XP (AIX, Solaris), Secure Path XP (HP-UX, Windows, Linux)
- Clustering - Local Cluster Solutions
- Long Distance Clusters - Cluster Extension XP
- Worldwide Clusters - Continental clusters

The XP10000 disk array also provides unique local and remote replication capabilities for the IBM eServer zSeries and for IBM z/OS, z/VM and VSE environments.

A full complement of software tools are available for XP10000 Disk Array management, management integration, and to enable a wide range of High Availability solutions. Please see the "HP StorageWorks XP Disk Array Software Products" QuickSpecs for further information:

http://h18000.www1.hp.com/products/quickspecs/12066_na/12066_na.html

Service and Support, HP Care Pack, and Warranty Information

Warranty and Services Included with the Product Services included with the XP10000 are:

- Hardware site preparation.
- Array installation and start up.
- Warranty level of hardware reactive support is 2 years, 24×7, 4 hour response on critical repairs. Next calendar day response for all other repairs.
- Proactive 24 proactive services
- Software support-1 year of 24×7 support services, which includes LTU, right to new versions, documentation, phone in assistance and access to the IT Resource Center
- Software enablement is bundled in with each individual software title.

HP Proactive 24 Service is an integrated hardware and software support solution designed to help you get more from your IT investment. It combines industry-leading preventive assistance with responsive support that helps you address problems quickly and effectively.

- Assigned account manager who is your primary contact for proactive services and access to HP's diverse technical resources
- Your account manager works closely with your IT staff to understand your environment and goals; document all the components of your infrastructure; recommend changes to improve availability, performance, and stability; and monitor ongoing operations using state-of-the-art remote tools
- Comprehensive 24 x 7 assistance
- 1 year 2-hour response for software issues, includes phone-in assistance, License to Use, rights to new versions, documentation and access to the IT Resource Center
- 2 years onsite response for hardware problems; 4-hour response for critical problems, next calendar day response for all other repairs.

HP warrants only that the Software media will be free of physical defects for a period of ninety (90) days from delivery.

For more information about HP's Global Limited Warranty and Technical Support, visit ftp://ftp.compaq.com/pub/products/storageworks/warranty/EN_321708-008.pdf

Recommended Services

- 3 Years - HP Proactive 24 Service
 - Easily extends support of your environment to three full years
- HP Support Plus 24 Service is recommended to cover any devices used as external storage that will appear as a LUNs on the XP10000
- Data Replication service
 - Accelerate your time-to-ROI with HP implementation and integration expertise
 - Enjoy rapid results when you deploy industry-leading HP Data Replication technologies
 - Provides optimal solution to meet your IT and business needs via flexible scalable services

Service and Support, HP Care Pack, and Warranty Information

Available HP Care Pack Services Extend your product warranty with a wide choice of cost-saving support packages.

HP Care Pack Services are sold by HP and HP authorized enterprise and commercial resellers. Services for customers purchasing via direct and enterprise resellers are quoted using HP order configuration tools. Additional information about HP Care Pack Service features and benefits is available at <http://www.hp.com/hps/carepack/services/>.

HP Care Pack Services Deployment and Per Event Services	Service Available
HP Installation & Startup	Included with HW
HP Implementation	Included with most SW titles
HP Data Replication Solution Service	Available

For more information about Deployment and Per Event Services for HP Storage, visit <http://www.hp.com/hps/storage/>.

HP Care Pack Services Availability Services	1 yr	3 yr	4 yr	5 yr
HP Proactive 24 Service	Included	Available	Available	Available
HP Critical Service	Available	Available	Available	Available

Deployment and Per Event Service Descriptions

- XP Performance Tuning and Optimization
 - Ongoing analysis and tuning designed to keep your array running efficiently.
- XP Performance Analysis
 - Provides data collection, detailed I/O analysis, and enhancement recommendations for the XP Disk Array.
- High Availability Storage Assessment
 - Identify potential risks to business success that may exist in your XP Storage/SAN environment.
- Availability Assessment for SANs
 - Recommendations for reducing or eliminating risks to the availability of your SAN infrastructure.
- SAN Solution Service
 - You get a powerful network storage solution up-and-running quickly and efficiently, with minimal disruption and rapid returns on your SAN investment.
- HP Open Systems Data Migration
 - Transfers your critical information to a new or reconfigured storage array in an open systems environment - across a data center or around the world.
- HP Open Systems Data Migration Extension
 - Accommodates additional capacity to be migrated beyond what is included in the base HP Open Systems Data Migration Service.
- HP Mainframe Data Migration
 - Transfers your critical information to a new or reconfigured storage array in a mainframe environment - across a data center or around the world.
- HP Mainframe Data Migration Extension
 - Accommodates additional capacity to be migrated beyond what is included in the base HP Data Migration Mainframe Service.

Service and Support, HP Care Pack, and Warranty Information

- HP Mixed Environment Data Migration
 - Transfers your critical information to a new or reconfigured storage array in a mixed mainframe and open systems environment - across a data center or around the world.
- HP Mixed Environment Data Migration Extension
 - Accommodates additional capacity to be migrated beyond what is included in the base HP Data Migration Mixed Environment Service.
- LUN Implementation for XP
 - When redeploying your storage array, this service maximizes effectiveness by providing the necessary activities to implement a new LUN or Virtual Disk (Vdisk) configuration.
- Data Replication Solution Service
 - Ensures a timely, cost-effective deployment of your data replication solution that cuts risk and shortens your time-to-results.

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>

Instant Support Enterprise Edition (ISEE)

HP Instant Support Enterprise Edition (ISEE) provides a single remote monitoring and support solution for your IT data center. ISEE uses continuous hardware event monitoring and automated notification to identify and prevent potential critical problems.

ISEE is a feature of HP Hardware Support Onsite Service with Next-Day response or better, Proactive Essentials, Proactive 24, Critical Service and warranty support for the selected products.

For more information or to download ISEE, visit <http://www.hp.com/go/instant-support>

HP Education Services

Managing The HP StorageWorks XP Disk Array (H6773s)

<http://education.hp.com/datasheets/h6773s.pdf>

For more information about HP Education Services for Storage and SAN, visit

<http://education.hp.com/curr-storsan.htm>

Service and Support, HP Care Pack, and Warranty Information

Additional Services Information

For more information about Deployment, Per Event, Consulting and Education services for HP Storage, visit: <http://www.hp.com/hps/storage/>

For more information about HP Care Pack Services for Storage, visit:

http://www.hp.com/hps/carepack/storage/cp_networked.html

For more information about HP Storage Software, services and updates, visit:

<http://h18006.www1.hp.com/storage/software.html>

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>

Family Information

Functionality Element	XP12000	XP10000	XP1024	XP128
Max Sequential Performance	9.9 GB/s	1.3 GB/s	2.1 GB/s	1.2 GB/s
Max Random Performance Cache	2,500,000 IOPS	700,000 IOPS	544,000 IOPS	272,000 IOPS
Max Random Performance Disk	120,000 IOPS	16,000 IOPS	66,000 IOPS	33,000 IOPS
Max Data Bandwidth	68 GB/s	8.5 GB/s	10 GB/s	5 GB/s
Max Control Bandwidth	13 GB/s	3.6 GB/s	5 GB/s	2.5 GB/s
Max Raw Capacity	454 TB* + 32 PB External Storage	95 TB* + 16 PB External Storage	149 TB*	36 TB*
Max Cache	256 GB	64 GB	128 GB	64 GB
Host System Interface	2 Gbps Fibre Channel 4 Gbps Fibre Channel ESCON 2 Gbps FICON 4 Gbps FICON iSCSI	2 Gbps Fibre Channel 4 Gbps Fibre Channel ESCON 2 Gbps FICON 4 Gbps FICON iSCSI	2 Gbps Fibre Channel ESCON 2 Gbps FICON iSCSI	2 Gbps Fibre Channel ESCON 2 Gbps FICON iSCSI
RAID levels supported	RAID 1 (2D + 2D) RAID 1 (4D + 4D) RAID 5 (3D + 1P) RAID 5 (7D + 1P) RAID 5 (14D + 2P) RAID 5 (28 D + 4P) RAID 6 (6D + 2P)	RAID 1 (2D + 2D) RAID 1 (4D + 4D) RAID 5 (3D + 1P) RAID 5 (7D + 1P) RAID 5 (14D + 2P) RAID 5 (28 D + 4P) RAID 6 (6D + 2P)	RAID 1 (2D + 2D) RAID 1 (4D + 4D) RAID 5 (3D + 1P) RAID 5 (7D + 1P)	RAID 1 (2D + 2D) RAID 1 (4D + 4D) RAID 5 (3D + 1P) RAID 5 (7D + 1P)
Drive Interface	2/4 Gbps FC-AL Dual Active Ports	2/4 Gbps FC-AL Dual Active Ports	1 Gbps FC-AL Dual Active Ports	1 Gbps FC-AL Dual Active Ports
Drive Capacity	73 GB FC15K rpm 146 GB FC 10K rpm 146 GB FC 15K rpm 300 GB FC 10K rpm 300 GB FC 15K rpm 400 GB FC 10K rpm	73 GB FC15K rpm 146 GB FC 10K rpm 146 GB FC 15K rpm 300 GB FC 10K rpm 300 GB FC 15K rpm 400 GB FC 10K rpm	36 GB FC 15K rpm 73 GB FC 10K rpm 73 GB FC 15K rpm 146 GB FC 10K rpm 300 GB FC 10K rpm	36 GB FC 15K rpm 73 GB FC 10K rpm 73 GB FC 15K rpm 146 GB FC 10K rpm 300 GB FC 10K rpm
Disk Drives	1152	240	1024	128
External storage capability	XP1024, XP128, XP512, XP48, XP256, EVA8000, EVA6000, EVA4000, EVA5000, EVA3000, MSA1500, MSA1000, EMC, IBM, ESS, and HDS arrays**	XP1024, XP128, XP512, XP48, XP256, EVA8000, EVA6000, EVA4000, EVA5000, EVA3000, MSA1500, MSA1000, EMC, IBM, ESS, and HDS arrays**	None	None
Online firmware update	One CHIP processor at a time keeps all ports operating with no host port interruption	One CHIP processor at a time keeps all ports operating with no host port interruption	One CHIP blade at a time keeps the other blade operating, may interrupt a host with a single connection	One CHIP blade at a time keeps the other blade operating, may interrupt a host with a single connection
Batteries	Nickel-Hydride batteries maintain system power for up to one minute during	Nickel-Hydride batteries that maintain Cache and Shared Memory during	Batteries that maintain cache and shared memory during outages	Batteries that maintain cache and shared memory during outages

Family Information

	power outages allowing for uninterrupted service. After one minute data is either destaged or Cache and Shared Memory is battery protected.	outages.		
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* The capacity of disk drives, and therefore the data capacity of the disk array, is based on 1K = 1000, not 1024. These means that 1 GB = 1,000,000,000 bytes and 1 TB = 1,000,000,000,000 bytes.

** For a complete/up-to-date list of supported arrays and accompanying firmware versions, please ask your HP representative.

Configuration Information

An extensive list of accessories is available for this product. For more information, please contact your reseller or authorized HP representative to work with the requirements to configure the product correctly.

HP StorageWorks XP10000 Disk Array

AE101A

NOTE: The XP10000 is a Structured Solution Product (SSP). This product number (AE101A) is a zero-price ordering mechanism that is used as an "umbrella" product to indicate to the ordering system that this is a new XP order.

Primary Rack

HP XP10000 Disk Control Frame - DKC

AE102A

Supports up to 120 disk drives. Contains Basic Redundant Power Supplies, base batteries, one Disk Chassis with space for 60 disk drives, HP microcode, HP Continuous Track XP, Modem and pcAnywhere. **Does not include ACP** (1 required per XP system).

4.5M power cord w/Nema L6-30P plug

AE102A#001

4.5M power cord with stripped ends

AE102A#002

4.5M power cord w/ IEC309 plug

AE102A#003

4.5M power cord w/ CEE7/7 plug

AE102A#004

4.5M Power Cord w/NEMA L6-20P Plug

AE102A#005

NonStop Server Connectivity

AE102A#010

XP10000 Disk Chassis (Min 0, Max 1)

HP XP10000 Disk Chassis

AE104B

Holds up to 60 disk drives. One Disk Chassis can be added to both the primary and second rack.

Combined ACP/CHIP pair

HP XP10000 16-Port FC SW CHIP 8-Port ACP

AE105B

HP XP10000 4Gb CHIP/ACP Combo Board

AE106A

Client-Host Interface Processor pairs (Max 1 pr)

HP XP12000/10000 FC 2Gb LW Transceiver

AE008A

HP XP12000/10000 FC 4Gb LW Transceiver

AE011A

HP XP12000/10000 8-Port FICON SW CHIP

AE013A

HP XP12000/10000 8-Port FICON LW CHIP

AE014A

HP XP12000/10000 16-Port FICON SW CHIP

AE015A

HP XP12000/10000 16-Port FICON LW CHIP

AE016A

HP XP12000/10000 16-Port EXSA CHIP

AE017A

HP XP12000/10000 8 Port Gb iSCSI CHIP

AE019A

HP XP12000/10000 8 Port 4Gb FC CHIP

AE021A

HP XP12000/10000 16 Port 4Gb FC CHIP

AE022A

HP XP12000/10000 32 Port 4Gb FC CHIP

AE023A

HP XP12000/10000 4Gb 16p FICON SW CHIP

AE062A

HP XP12000/10000 4Gb 16p FICON LW CHIP

AE063A

Cache Memory (Min 4GB, Max 32 GB)

HP XP12000/10000 4-GB Cache Memory

AE025A

HP XP12000/10000 8 GB Cache Memory

AE026A



Configuration Information

DKC-DKU Additional Battery (Min 0, Max 2)

HP XP10000 Battery

AE110B

1 additional Battery required when exceeding 12 GB cache or when exceeding 3 GB Shared Memory. The second additional Battery required when exceeding 28 GB cache.

Shared Memory (Min 1GB, Max 6GB)

HP XP12000/10000 1-GB Shared Memory

AE030A

XP10000 Disk Array Frame (DKU) - Second Rack

HP XP10000 Disk Array Frame

AE115B

Min 0, Max 1. Second rack includes power supplies, base batteries, and one Disk Chassis with space for up to 60 disk drives.

4.5M power cord w/Nema L6-30P plug

AE115B#001

4.5M power cord with stripped ends

AE115B#002

4.5M power cord w/ IEC309 plug

AE115B#003

4.5M power cord w/ CEE7/7 plug

AE115B#004

4.5M Power Cord w/NEMA L6-20P Plug

AE115B#005

XP Disk Drives Array Groups

Each Array Group consists of 4 disk drives

Min 1, Max 14 with Primary Rack. Min 15, Max 29 with Primary Rack with Additional Disk Chassis

Min 30, Max 44 with Second Rack. Min 45, Max 59 with Second Rack with Additional Disk Chassis

Fibre Channel Disk Drives

HP XP10000 73GB 15k rpm Array Group

AE120A

HP XP10000 146GB 10k rpm Array Group

AE121A

HP XP10000 146GB 15k rpm Array Group

AE122A

HP XP10000 300GB 10k rpm Array Group

AE123B

HP XP10000 300GB 15k rpm Array Group

AE124A

HP XP10000 400GB 10k rpm Array Group

AE125A

Spare Fibre Channel Disk Drives

Min 1 per array group capacity/rpm, Max 16

HP XP10000 73GB 15k rpm Spare Disk

AE120AS

HP XP10000 146GB 10k rpm Spare Disk

AE121AS

HP XP10000 146GB 15k rpm Spare Disk

AE122AS

HP XP10000 300GB 10k rpm Spare Disk

AE123BS

HP XP10000 300GB 15k rpm Spare Disk

AE124AS

HP XP10000 400GB 10k rpm Spare Disk

AE125AS

Upgrades

HP StorageWorks XP12000/10000 Upgrade

AE070A

NOTE: This product number (AE070A) is a zero-price ordering mechanism that is used as an "umbrella" product to indicate to the ordering system that this is an upgrade XP order.

HP StorageWorks XP10000 upgrade components

HP XP10000 Upgr Disk Chassis

AE104BU

HP XP10000 Upgr 4Gb CHIP/ACP Combo Board

AE106AU



Configuration Information

HP XP12000/10000 Upgr 2Gb LW Transceiver	AE008AU
HP XP12000/10000 Upgr 2Gb SW Transceiver	AE009AU
HP XP12000/10000 Upgr 4-Gb LW Transceiver	AE011AU
HP XP12000/10000 Upgd 4Gb SW Transceiver	AE012AU
HP XP12000/10000 Upgr 8 FICON SW CHIP	AE013AU
HP XP12000/10000 Upgr 8 FICON LW CHIP	AE014AU
HP XP12000/10000 Upgr 16 FICON SW CHIP	AE015AU
HP XP12000/10000 Upgr 16 FICON LW CHIP	AE016AU
HP XP12000/10000 Upgr 16-Port EXSA CHIP	AE017AU
HP XP12000/10000 Upgr 8-Port Gb iSCSI CHIP	AE019AU
HP XP12000/10000 Upgr 8 Port 4Gb FC CHIP	AE021AU
HP XP12000/10000 Upgr 16 Port 4Gb FC CHIP	AE022AU
HP XP12000/10000 Upgr 32 Port 4Gb FC CHIP	AE023AU
HP XP12000/10000 Upgr 4-GB Cache Memory	AE025AU
HP XP12000/10000 Upgr 8 GB Cache Memory	AE026AU
HP XP10000 Upgr Battery	AE110BU
HP XP12000/10000 Upgr 1-GB Shared Memory	AE030AU
HP XP12000/10000 Upgr 4Gb16p FICON SW CHIP	AE062AU
HP XP12000/10000 Upgr 4Gb16p FICON LW CHIP	AE063AU
HP XP10000 Upgr Disk Array Frame	AE115BU
4.5M power cord w/Nema L6-30P plug	AE115BU#001
4.5M power cord with stripped ends	AE115BU#002
4.5M power cord w/ IEC309 plug	AE115BU#003
4.5M power cord w/ CEE7/7 plug	AE115BU#004
4.5M Power Cord w/NEMA L6-20P Plug	AE115BU#005
HP XP10000 73GB 15k Upgr Array Group	AE120AU
HP XP10000 146GB 10k Upgr Array Group	AE121AU
HP XP10000 146GB 15k Upgr Array Group	AE122AU
HP XP10000 300GB 10k Upgr Array Group	AE123BU
HP XP10000 300GB 15k Upgr Array Group	AE124AU
HP XP10000 400GB 10k Upgr Array Group	AE125AU
HP XP10000 73GB 15k Upgr Spare Disk	AE120AT
HP XP10000 146GB 10k Upgr Spare Disk	AE121AT
HP XP10000 146GB 15k Upgr Spare Disk	AE122AT
HP XP10000 300GB 10k Upgr Spare Disk	AE123BT
HP XP10000 300GB 15k rpm Upgr Spare Disk	AE124AK
HP XP10000 400GB 10k rpm Upgr Spare Disk	AE125AK

Technical Specifications

Model	HP StorageWorks XP10000 Disk Array						
Number of Disk Drives	0 -240 in 1 to 2 racks (primary rack holds 120 disk drives and the second rack holds up to 120 more disk drives)						
Disk Drives, Interface	Disk Drives, Capacity and Spindle Speed	73 GB - 15K rpm	146 GB - 10K rpm	146 GB - 15K rpm	300 GB - 10K rpm	300 GB - 15K rpm	400 GB - 10K rpm
	Rotational latency	2.01 ms	2.99 ms	2.01 ms	2.99 ms	2.01 ms	2.99 ms
	Average Read/Write Seek Time	3.8/4.2 ms	4.9/5.4 ms	3.8/4.1 ms	4.7/5.1 ms	3.5 /4.0 ms	3.9/4.2 ms
	Internal data transfer rate	95 to 141 MB/sec	59 to 114 MB/sec	95 to 141 MB/sec	59 to 114 MB/sec	120 to 202 MB/sec	91 to 151 MB/sec
Capacity	576 GB - 95 TB raw 288 GB - 83 TB usable						
RAID Level	RAID 1 (2D + 2D) RAID 1 (4D + 4D) RAID 5 (3D + 1P) RAID 5 (7D + 1P) RAID 5 (14D + 2P) RAID 5 (28 D + 4P) RAID 6 (6D + 2P)						
Maximum number of Logical Devices (LDEVs)	16,834						
Cache memory	4 GB - 64 GB						
Shared memory	1 GB to 6 GB						
Battery backup time	36 hours minimum						
Operating Systems	HP-UX, Tru64, Open VMS, NonStop, Solaris, AIX, Windows, NetWare, IRIX64, Linux, Mainframe						
Host Interface	Fibre Channel, ESCON, FICON, and iSCSI						
Host Ports	16 to 48 by increments of 8/16/32 NOTE: 16 Fibre Channel ports (1-4 Gbps) are included on the combination CHIP/ACP that is required for every XP10000. One additional CHIP of any type can be added to an XP10000.						
Drive Interface	Dual ported 2/4 Gbps Fibre Channel Arbitrated Loop (FC-AL)						
Regulatory Approvals	This product meets all applicable safety and regulatory specifications						
Primary Rack Physical Dimensions	Width x Depth x Height	24 x 36.4 x 75.6 in (610 x 925 x 1920 mm)					
	Max Weight	1272 lb (577 kg)					
Second Rack Physical Dimensions	Width x Depth x Height	24 x 36.4 x 75.6 in (610 x 925 x 1920 mm)					
	Max Weight	1043 lb (473 kg)					
Primary Rack Shipping Dimensions	Width x Depth x Height	37.4 x 43.7 x 80 in (950 x 1110 x 2030 mm)					
	Max Weight	1521 lb (690 kg)					
Second Rack Shipping Dimensions	Width x Depth x Height	37.4 x 43.7 x 80 in (950 x 1110 x 2030 mm)					
	Max Weight	1292 lb (586 kg)					

Technical Specifications

Heat Dissipation and Power Consumption Specifications

Parameter	Primary Rack	Second Rack	Full Array
Power consumption (kVA)	4.9	3.2	8.1
Heat dissipation (kW)	4.6	3.0	7.6
BTUs per hour	15710	10246	25955
Kcal per hour	3959	2582	6541

Primary Rack AC line voltage requirements

20-amp, 50 or 60 Hz, Single-phase operation

Parameter	Nominal Rated Voltage (VAC)				
	200	208*	220	230	240
Minimum operating voltage (VAC)	184	191	202	212	221
Maximum operating voltage (VAC)	21	220	233	244	254
Number of power cords	4	4	4	4	4
Number of circuit breakers	4	4	4	4	4
Recommended circuit breakers	20A	20A	20A	20A	20A

*60 Hz only

Second Rack AC line voltage requirements

20-amp, 50 or 60 Hz, Single-phase DKU operation

Parameter	Nominal Rated Voltage (VAC)				
	200	208*	220	230	240
Minimum operating voltage (VAC)	184	191	202	212	221
Maximum operating voltage (VAC)	212	220	233	244	254
Number of power cords	2/4**	2/4**	2/4**	2/4**	2/4**
Number of circuit breakers	2/4**	2/4**	2/4**	2/4**	2/4**
Recommended circuit breakers	20A	20A	20A	20A	20A

* 60 Hz only
 ** 4 power cords provided with AE115B DKU. Only 2 power cords and 2 circuit breakers required with base AE115B without additional Disk Chassis AE104B. 4 power cords and 4 circuit breakers required when additional Disk Chassis AE104B is installed in second rack.

Technical Specifications

Environmental Specifications

Item	Condition		
	Operating ¹	Non-operation ²	Shipping & Storage ³
Temperature (°C)	16 to 32	-10 to 43	-25 to 60
Relative Humidity (%) ⁴	20 to 80	8 to 90	5 to 95
Max. Wet Bulb (°C)	26	27	29
Temperature Deviation (°C/hour)	10	10	20
Vibration ⁵	5 to 10Hz: 0.25mm 10 to 300Hz: 0.05G	5 to 10Hz: 2.5mm 10 to 70Hz: 0.5G 70 to 99Hz: 0.05mm 99 to 300Hz: 1.0G	0.5G, 5min. At the resonant frequency with the highest displacement found between 3~100Hz
Shock	—	8G, 15ms	Horizontal: Incline Impact 1.22m/s
			Vertical: Rotational Edge 0.15m
Acoustic Level ⁶	65dB	—	—

NOTES:

1. Environmental specification for operating condition should be satisfied before the disk subsystem is powered on. Maximum temperature of 32°C should be strictly satisfied at air inlet portion. Recommended temperature range is 21 to 24°C.
2. Non-operating condition includes both packing and unpacking conditions unless otherwise specified.
3. On shipping/storage condition, the product should be packed with factory packing.
4. No condensation in and around the drive should be observed under any conditions.
5. The above specifications of vibration apply to all three axes.
6. Measurement Condition: The point 1m far from floor and surface of the product.

Accessories

An extensive list of accessories is available for this product; for more information, please contact your HP sales representative

Safety

This product meets all applicable safety and regulatory specifications

Software

HP StorageWorks Command View XP Advanced Edition
 HP StorageWorks XP Tiered Storage Manager
 HP StorageWorks XP Provisioning Manager
 HP StorageWorks XP Replication Monitor
 HP StorageWorks LUN Configuration & Security Manager XP
 HP StorageWorks Performance Advisor XP
 HP StorageWorks Performance Control XP
 HP StorageWorks Auto LUN XP
 HP StorageWorks Data Exchange XP
 HP StorageWorks Business Copy XP
 HP StorageWorks Continuous Access XP
 HP StorageWorks External Storage XP
 HP StorageWorks RAID Manager XP

Technical Specifications

- HP StorageWorks Flex Copy XP
- HP StorageWorks Secure Path XP/Auto Path XP
- HP StorageWorks Cluster Extension XP
- HP StorageWorks XP Data Shredder
- HP StorageWorks XP Disk/Cache Partition
- HP StorageWorks Fast Recovery Solution XP
- HP Storage Essentials

The HP StorageWorks XP Disk Array family also provides unique capabilities for the IBM eServer zSeries and for IBM z/OS, z/VM and VSE environments. XP mainframe capabilities include local and remote replication (hardware and host based) of mainframe volumes, DB2 cloning, mainframe array based partitioning, advanced cache, security and archive functions and multiple concurrent I/O handling.

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