HP StorageWorks XP Disk Array Mainframe solutions

Solution brief

Mainframe computers are well known for their exceptional reliability and availability. These characteristics are vital to companies around the world that require uninterrupted access to business-critical applications.

With the highly reliable and highly available HP StorageWorks XP Disk Array solutions, you can rest easy knowing that you have the perfect storage solution for your mainframe. HP StorageWorks XP Disk Array hardware, software and services provide everything you need for the implementation and management of your online mainframe storage environment.

Designed to meet the exacting performance, availability and service levels demanded by the world's largest organizations, the wide range of mainframe storage solutions from HP support all mainstream z/Architecture and S/390 mainframe operating system platforms—including z/OS, z/VM, z/VSE and z/Linux.

HP offers comprehensive Fibre Connectivity (FICON), Enterprise Systems Connection (ESCON) and Fibre Channel connectivity. These help you store, protect and manage both mainframe and open systems data on the same storage area network (SAN) and XP disk arrays.

With HP, you get all of the services, infrastructure and solutions you need to handle explosive data growth and regulatory compliance without service interruption.

Key features and benefits

Decrease the stress of mission-critical IT with HP StorageWorks XP Disk Arrays. Confidently manage your storage environment knowing that you have constant access to vital data, whether you must efficiently manage changing storage resources, or continue operations in the midst of disaster.

- **Mainframe pedigree**—HP StorageWorks XP Disk Arrays are designed for organizations that demand the most from their storage. They are compatible with IBM mainframe operating systems software and I/O, and support a wide variety of FICON-capable switches and directors.

- **Constant data availability**—HP StorageWorks XP Disk Arrays deliver constant data availability for mission-critical applications where downtime is not an option. They are designed with no single point of failure and non-disruptive online upgrades so that data is constantly available.

- **Seamless business growth**—HP StorageWorks XP Disk Arrays allow you to simplify your data center by consolidating mainframe and open systems data on the same platform. With support for external storage, XP disk arrays provide significant consolidation and scalability, all at a lower total cost of ownership.

- **Complete solution**—HP StorageWorks XP Disk Arrays are supported by a complete range of HP storage design, architecture, deployment and support services.

HP StorageWorks XP Disk Array hardware

Designed from day one for the mainframe environment, HP StorageWorks XP Disk Arrays are enterprise-class storage systems that deliver dependable performance for environments where downtime is not an option. Complete redundancy throughout the architecture provides non-disruptive online upgrades and no single point of failure so you can count on your data being available.

HP StorageWorks XP Disk Arrays are designed to be compatible with z/Architecture and S/390 mainframe operating systems, providing IBM 3990-6E, 2105 and 2107 storage system controller emulation. Some of the important hardware features include:

- Scalable up to 1,152 disk drives to meet consolidation and growth needs—up to 332 TB raw capacity
- Attach another array behind the XP disk array and manage it as if it were an XP disk array—up to 247 petabytes (PB) of external storage managed from a single XP disk array
- Support for up to 130,560 logical devices (LDEVs) (volumes)
- Broad support for disk emulation types: 3390-3, -9, -27, -54 and 3380-3
- Compatible with IBM z/Series FICON Express, FICON Express 2 and FICON Express 4, as well as ESCON and Fibre Channel connectivity
- Allows resource allocation and workload isolation with partitioning
- Supports FICON Control Unit Initiated Reconfiguration (CUIR)—enabling replacement of channel interface cards with no operator intervention

HP StorageWorks XP Disk Arrays include performance features specifically designed for the mainframe environment.

- Support for Cache Fast Write (CFW), DASD Fast Write (DFW) and Sequential Data Striping—full compatibility with earlier functionality
- Parallel Access Volume (PAV)—a software product enabling concurrent I/Os to a single volume from a single image
- Multiple Allegiance (MA)—concurrent I/Os to a single volume from multiple images
- Priority I/O Queuing—prioritization of I/O by workload
- FICON Modified Indirect Data Address Word (MIDAW)—z9 processor feature that enhances performance by reducing the number of channel command words (CCWs) and frames processed

HP StorageWorks XP Disk Arrays support FICON switches and directors, including:

- HP StorageWorks 4/256 SAN Director with FICON Control Unit Port license
- Cisco MDS Director Switches with FICON license
- Cisco MDS 9216A and 9216i Fabric Switches with FICON license

HP StorageWorks XP Disk Array software

The HP StorageWorks XP Disk Array family offers a complete portfolio of software applications designed to reduce the stress of mission-critical IT.

Point-in-time copies
- HP XP StorageWorks Business Copy—mirror capability with up to nine cascading copies, for open system volumes
- Hitachi ShadowImage for Mainframe (bundled with XP Business Copy)—mirror capability with up to three copies, for mainframe volumes
- HP StorageWorks XP for FlashCopy Mirroring—snapshot capability at the volume or dataset level
- Hitachi Logical Volume Divider for Mainframe (bundled with Business Continuity Manager for XP24000/XP20000)—replicates datasets in a z/OS environment
- Concurrent Copy—an operating system copy function that enables data centers to take a copy or a dump of data while applications are updating that data

Performance monitoring
- HP StorageWorks XP Performance Advisor—XP disk array internal performance monitor with access to the disk array through Fibre Channel
- Performance Monitor (a component of XP Array Manager for XP24000/XP20000, a component of XP Auto LUN for XP12000/XP10000)—XP disk array performance monitor with access to the disk array through Ethernet
- RMF Magic from IntelliMagic—performance reporting, monitoring, planning and troubleshooting tool

Backup/restore
- Harbor Enterprise NSM from Beta Systems Software AG—XP disk array mainframe and open system environment (OSE) backup solution

Performance enhancement
- HP StorageWorks XP Auto LUN—XP disk array dynamic volume migration
- Virtual Logical Volume Image (VLVI) (a component of XP Array Manager for XP24000/XP20000 and a component of LUN Configuration and Security Manager XP for XP12000/XP10000)—Custom volume size—creation of smaller volumes
- Cache Residency (a component of XP Array Manager for XP24000/XP20000) / Cache LUN (a component of LUN Configuration and Security Manager XP for XP12000/XP10000)—locks volumes in cache
- Hitachi Cache Manager Utility for Mainframe (a component of XP Array Manager for XP24000/XP20000 and a component of LUN Configuration and Security Manager XP for XP12000/XP10000)—locks data sets in cache

Some of the features of HP StorageWorks XP External Storage software include:

- External mainframe volume
  - Import or map existing mainframe volumes of XP24000, XP20000, XP12000, XP10000 and comparable Hitachi arrays to the XP disk array
  - Format external open LDEVs of cache-centric and distributed storage arrays into mainframe LDEVs
- Broad support of XP disk array software
  - XP Auto LUN
  - Hitachi ShadowImage for Mainframe
  - HP StorageWorks XP for FlashCopy Mirroring
  - Hitachi TrueCopy and TrueCopy Async for Mainframe
  - Hitachi Universal Replicator for Mainframe
  - Hitachi LDEV Guard for Mainframe

Disaster-proof your business

Disasters take on many forms, ranging from something as common as a data center air conditioning failure or a power outage, to widespread and destructive natural disasters such as hurricanes, earthquakes and floods. HP StorageWorks XP Disk Array business-continuity solutions help protect critical information so that it is available when needed, allowing businesses to focus on their business, even when disaster strikes.

Because maintaining operations in times of crisis can mean the difference between the continued success of a business and its failure, HP provides a number of different software solutions to help you manage your systems in the event of a disaster. Important components of HP disaster recovery solutions are:

XP Continuous Access Synchronous
- Array-based synchronous remote copy solution for both mainframes and open systems
- Mainframe volume synchronous remote replication is provided by Hitachi TrueCopy for Mainframe (bundled with XP Continuous Access Sync)
- TrueCopy provides full support for Peer-to-Peer Remote Copy (PPRC) as well as GDPS/PPRC
- TrueCopy provides full P/DAS (PPRC Dynamic Address Switching) support—Dynamic swap for volume relocation between XP disk arrays

XP Continuous Access Asynchronous
- Array-based asynchronous remote copy solution for both mainframes and open systems
- Mainframe volume asynchronous remote replication is provided by Hitachi TrueCopy Async for Mainframe (bundled with XP Continuous Access Async)
- TrueCopy Async does not require host cycles and can be controlled from the host using native PPRC commands—"XRC in a box"

Multi-platform data movement
- HP StorageWorks XP Data Exchange—moves data between mainframe and open systems, and between open systems, at the file level

Security
Volume Security and Volume Security Port Option (components of XP Array Manager for XP24000/ XP20000) / SANtinel and SANtinel Port Security Option (components of LUN Configuration and Security Manager for XP12000/XP10000)—allow volumes and ports to be seen or not by individual LPARs

Volume Retention Manager (a component of XP Array Manager for XP24000/XP20000) / Hitachi LDEV Guard (a component of LUN Configuration and Security Manager for XP12000/XP10000)—used for data archiving

Volume Shredder (a component of XP Array Manager for XP24000/XP20000) / HP StorageWorks XP Data Shredder (for XP12000/XP10000)—data removal with enhanced security features

Simplify management through virtualization

In today's business world, mergers, acquisitions and technology changes have created IT environments where varieties of dissimilar servers and storage must coexist. HP StorageWorks XP External Storage software decreases the stress and reduces the cost of owning heterogeneous data storage by simplifying and centralizing common SAN management tasks through storage virtualization. In addition it simplifies movement of data between dissimilar arrays. HP StorageWorks XP External Storage provides these benefits by giving storage administrators the ability to access, monitor and manage data residing on a variety of different disk arrays as if all of the data were residing on an XP disk array. HP StorageWorks XP External Storage software supports both open and mainframe systems.

XP Continuous Access Journal

- An asynchronous remote copy solution that requires less network bandwidth by using journal data sets at the primary and secondary sites
- Mainframe volume journal-based remote replication is provided by Hitachi Universal Replicator for Mainframe (bundled with XP Continuous Access Journal)

Business Continuity Manager (BCM)

- A software product that simplifies and centralizes management of the XP disk array-based replication capabilities for the mainframe environment
- Includes centralized creation and maintenance of consistency groups across multiple XP arrays
- Links to Replication Monitor, a plug-in to XP Command View Advanced Edition, to allow centralized monitoring of mainframe and open systems replication

HP StorageWorks XP for Compatible Extended Remote Copy (XRC)

- An asynchronous remote copy solution that is compatible with IBM's XRC and GDPS/XRC. XRC is a replication technology that utilizes array-based code and host-based System Data Mover

HP storage solutions in action

Vseobecna Uverova Banka, A.S.

Slovakia-based Vseobecna Uverova Banka, A.S. (VÚB), provides a wide range of banking and financial services to corporate, institutional and private customers.

VÚB had a pair of data centers separated by two kilometers. Each site was populated with a mixture of mainframe and open systems environments. Their legacy IBM arrays were linked in a disaster-tolerant configuration based on PPRC. This infrastructure was no longer meeting their needs. They wanted to upgrade to 4 GB interconnect technology, and migrate and consolidate their storage onto higher performance platforms.

They turned to HP to help them design a new disaster tolerant configuration. The resulting implementation uses two HP StorageWorks XP12000 Disk Arrays, one in each data center, connected through B-Series switches, and using the synchronous remote replication capability of TrueCopy. To migrate data from the old disk arrays to the new XP12000 disk arrays they used Softek TDMF.

With HP, VÚB now has a storage implementation with improved performance and reliability, with the ability to scale into the future.

For more information

For more information about HP StorageWorks XP Disk Array Mainframe solutions, visit **www.hp.com/go/xpmainframe**

HP Services

HP Services has excellent, end-to-end expertise in delivering solutions that help you improve your business agility. From initial assessment and design to technical integration and ongoing support, HP Services can be your single point of contact and accountability.

HP related services:

- **SAN Solution Service**—provides for the implementation of Fibre Channel switches in a storage area network (SAN) environment. The tier and level of SAN Solution Service is determined by the size and complexity of the SAN environment.

- **HP Data Replication Solution Service**—includes services for XP Continuous Access, TrueCopy, Universal Replicator, XP Business Copy, ShadowImage, XP Snapshot, BCM, and XRC. The Continuous Access option provides implementation and verification of the Continuous Access feature of the XP disk array. The service is offered at three service levels, ranging from basic installation to more comprehensive implementation that can be tailored to meet the specific needs of your storage environment.

- Other applicable HP storage services include:
  - Backup and Recovery Solution Service
  - Disaster Tolerant Management Service
  - Electronic Vaulting for Enterprises
  - Storage Essentials Solution Service
  - HP Vdisk/LUN Design and Implementation Service
  - HP Performance Analysis for the XP/EVA Disk Arrays Service
  - HP FICON Installation and Startup Service
  - HP Data Migration Service, including the following Mainframe Data Migration Services
  - HP Online Data Migration Service using Softek TDMF
  - HP Online Data Migration Service using Softek LDMF
  - HP Storage Relocation Service using TrueCopy
  - HP Storage Relocation Service using XRC

- **HP Care Pack Services**—is a comprehensive portfolio of services for maintaining the highest levels of IT availability.
  - Critical Service
  - Proactive 24 Service

- **Instant Support Enterprise Edition (ISEE)**—provides remote monitoring and support solution for your servers, storage and networks.

- Business Continuity Services—protect and reduce disruption to IT infrastructure and associated business processes against site outages, disasters and environmental events.

Across the globe, enterprise customers rely on HP Services to design, deploy, manage and support the IT systems that run their businesses. HP Services capabilities cover consulting and integration, outsourcing and support services. With more than 69,000 services professionals operating in 170 countries, acknowledged technology leadership, and a heritage of innovation in services, HP Services can point to an extensive track record of helping customers improve their ability to support their changing business needs.

For further details, contact your HP representative or visit **www.hp.com/hps/storage**.

To learn more, visit www.hp.com

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