Heterogeneous Data Migration using HP StorageWorks MPX200 Multifunction Router

Business white paper

DISCOVER

a simpler way to migrate your data.

It's time to tackle your storage consolidation issues

Increasing customer and business demands are driving organizations to look for a more efficient way to manage, share, store, and protect data. Pressure mounts as some organizations have to deal with application and infrastructure sprawl due to developments within the organization or mergers and acquisitions. Data has become the most valuable asset of organizations and in most cases, diverse applications, databases, and legacy systems make data difficult to manage.

Organizations are realizing that it is imperative to invest in successful data storage consolidation and replication to enhance the efficiency of the systems that utilize data in its entirety or in part. But this often means that they need to migrate data from older storage arrays to newer ones every three to four years. This process can be very complex, time-consuming, and costly.

This brochure discusses the challenges associated with data migration and explains how organizations can successfully and cost-effectively migrate their data between heterogeneous storage arrays (online and offline migration) using HP StorageWorks MPX200 platform.

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Enable simple data migration

As mid-range and enterprise businesses grow and deploy physical/virtual servers and storage arrays, the amount of data they are required to manage, share, and protect continues to grow. This puts a lot of pressure on CIOs to adopt a data quality framework to preserve the integrity of the data while trying to cope with end-of-life or lease storage systems. In addition, for situations such as technology transitions, mergers and acquisitions, tiered storage strategies, virtualization driven server consolidation, and storage consolidation organizations need a data quality management system to achieve good quality data.

While data migration seems to be the obvious choice, is it really that simple?

Organizations attempting to migrate their data face challenges with the following:

- Configuration details
- Uncertainty in the support matrix
- Risk of losing data
- Downtime
- Budget constraints
- Project impact assessment
- Partnering with other departments
- Security restrictions
- Data integrity checks
- Inadequacy in the mapping design
- Migration failback policy
- Data validation
- Security validation
- Migration audit
- Migration sign-off
- Migration of normal to thin-provisioned storage (new capability supported on MPX200)

These make data migration a business-critical task though a necessary one.

If you want to make your IT investment count in this highly competitive business environment, you need a solution that can help you secure your data while migrating to new systems quickly—all this in a simple, cost-effective manner.

The MPX200 Multifunction Router enables high-performance data migration between heterogeneous storage arrays (online and offline migration), and enterprise-class high availability with no single point of failure. It extends HP Enterprise Virtual Array (EVA) and HP StorageWorks XP investments by adding multi-protocol support without requiring separate storage arrays or additional management costs. It enables modular multi-protocol SAN designs with increased scalability, stability, return on investment (ROI), and simpler to manage storage solutions for virtualized server environments.

Convert a normal-provisioned (thick) LUN easily to a thin-provisioned LUN

The MXP200 provides the option to create a data migration job to a thin-provisioned LUN. You can migrate data either online or offline. If the destination LUN supports thin provisioning, you can opt to configure a migration job as thin provisioned. Why is this important? Most SAN-based block storage is "thick" or raw storage; and most storage is often over provisioned, resulting in extra costs for the storage consumer. The MPX200 can take a "thick" LUN and convert to a thin LUN, and the net customer benefit is significant savings in disk space and disk space per data center floor tile.

Transform your storage for greater agility, simplicity, and value

Unified block storage

The MPX200 provides unified block storage on EVA. Multi-protocol support includes: 10GbE, 1GbE iSCSI, FC, and FCoE along with FCIP and online/offline data migration support across heterogeneous storage arrays.

The MPX200 enables simultaneous iSCSI, FC, and FCoE connectivity to the EVA, resulting in increased storage consolidation and utilization. The MPX200 can also be used to provide 1GbE, 10GbE iSCSI to HP StorageWorks XP arrays including 3PAR, P9500, XP, and EVA. See HP SPOCK for supported configurations.

The MPX200 enables simultaneous iSCSI, FC, and FCoE connectivity to the EVA, resulting in increased storage consolidation and utilization.

Up to four EVA arrays can be connected through a single MPX200 router. Servers can then connect to the EVA arrays using freely available iSCSI initiators, thus leveraging existing Ethernet networks to deliver SAN-like benefits.

The MPX200 is fully integrated with HP StorageWorks Command View EVA Software to manage iSCSI, Fibre Channel, and Fibre Channel over Ethernet EVA connectivity. FCoE is enabled on MPX200 at no charge with just a firmware download.

Enterprise-class high availability

MPX200's enterprise-class high-availability design provides dual hot-plug power supplies and router blades for no single point of failure. All MPX200 configuration information is mirrored between the dual redundant blades and the unique addressing information which is stored in the chassis (Mac address, WWN, and the like). This mirroring of configuration information provides for seamless blade replacement without the need to update zoning or configuration specific files.

Stay up and running while migrating your data

Data migration may be disruptive to business-critical applications; and that's why reducing application downtime is very important. The HP StorageWorks MPX Manager for Data Migration Services (DMS) software is designed to simplify data migration jobs for decreased downtime, while providing protection against common user errors. DMS reduces downtime by allowing the complete setup and configuration of data migration jobs (except for immediate scheduling of the jobs) without bringing down other applications.

The MPX200 DMS technology has the following features:

Online support: MPX200 can start migrating customers' application data without having to schedule downtime before or during the migration process. This can reduce the risk of executing migration jobs in the customer's data center. MPX200 can create a block copy of the source disks onto the desired destination disks. (Note: Size of the destination disks can be equal or larger than the source disk.) This enables customers to create larger disks when migrating to newer storage arrays to meet growing business needs. The only time customers need to schedule a downtime for their application servers is when the production application gets switched over from the older storage array to the new storage array.

Migration job scheduling: MPX200 is your data migration job scheduler. MPX200 DMS provides several job scheduling options, which allows you to complete the time-consuming task of configuring data migration jobs without requiring any downtime. The different I/O size capabilities for migration jobs enable you to tune the storage array's performance during sequential read/write operations. The load balancing option is also very useful when dealing with older-generation, lower-speed arrays (such as 2 Gb and 4 Gb FC being migrated to higher-speed (4 Gb and 8 Gb FC) arrays using higher-speed (4 Gb and 8 Gb) FC switches. Application downtime is reduced with online migrations as only reboot required is during the cutoff from the old storage to the new storage array.

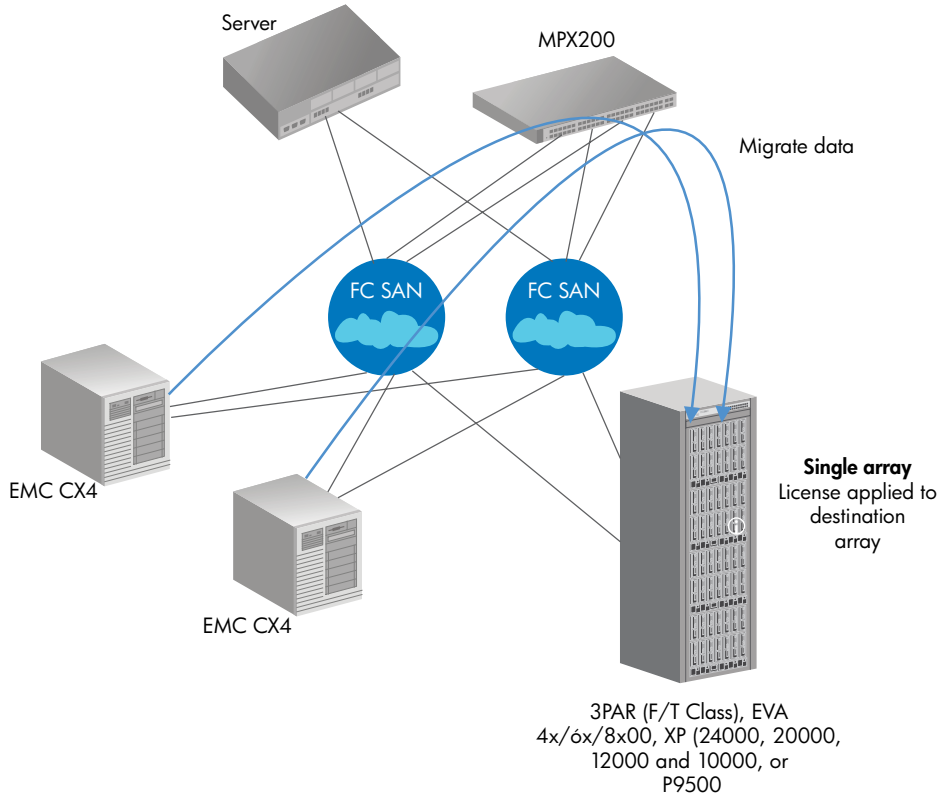
Data Migration Services logs: DMS logs are maintained separately from the system logs. DMS logs-are designed to help the service professional maintain a full, detailed history of each job performed, and can be submitted as a part of the migration report to the customer.

FC SAN vendor independent: The MPX200 supports B-series and C-series FC fabrics. HP StorageWorks MPX Manager allows data migration across multivendor fabrics.

Heterogeneous array support: The MPX Manager for DMS supports data migration across heterogeneous arrays (arrays manufactured by different vendors). For a list of supported storage array, visit **http://www.hp.com/storage/spock**.

Ease of use: The MPX Manager for Data Migration Services is simple to use. The GUI and CLI provide many wizard-based operations and user-level protection.

Figure 1: The fan-in model



Data security and sanity: The MPX Manager for DMS provides features to classify a storage array as source only, making it impossible to write data to that array and thus reducing the chances of data corruption. It also provides a Verify Migration Job wizard to compare data on the source LUN with that on the destination LUN to indicate that the data copy occurred without any data loss or corruption.

Logging and troubleshooting: System logs are designed to store significant number of details that can be used for debugging and troubleshooting. The save capture command captures the system log that you can use to detect and troubleshoot problems when the MPX200 is exhibiting erroneous behavior. This helps to record the configuration details, system logs, and MPX200 state at any time, and can be used for troubleshooting if the need arises.

Licensing: DMS licenses provide capacity- (per TB) and array-based licenses.

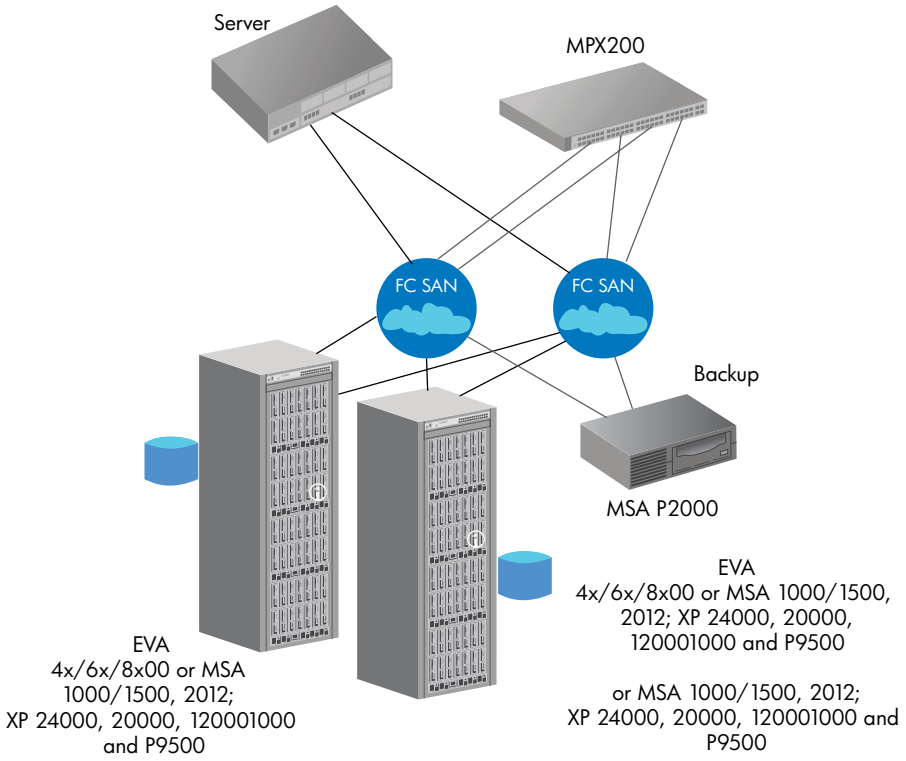
Take advantage of flexible licensing options

HP offers two types of data migration licenses—capacity-based and array-based licenses. For smaller data migration projects (less than 15 terabytes), capacity-based licenses represent a better value while for larger migration projects, array-based license provide good value as it allows you to migrate unlimited amount of data using these licenses.

Capacity-based licenses

Capacity-based licenses allow you to migrate data up to a specific limit designated by the applied license key. This type of license is available in variants of 1 TB and 5 TB capacities, which can be consumed by one or more migration jobs that you specify. Every time you configure a data migration job, the available capacity is reduced by an amount equivalent to the size of the source LUN being migrated. The MPX200 does not allow you to add migration jobs when the job size exceeds available migration licenses. These licenses can be used to span multiple migration jobs as long as there is capacity left in the MPX platform.

Figure 2: Quick backup



Array-based licenses

Array-based licenses allow you to migrate unlimited amounts of data to and from the specific array that is licensed. These licenses are available in variants of SINGLE-ARRAY and 3-ARRAY capacity. The licensed array may be used as either a source or destination array while configuring jobs for data migration. Consider the 3-ARRAY license* as a value-pack for those wanting to buy these licenses in bulk and get a better value. Array-based licenses are available in two types: Fan-in and fan-out models.

The Fan-in model allows you to migrate from multiple storage arrays to a new storage array by using a single array license. With storage capacity increasing exponentially, the fan-in model offers you an important benefit—you can migrate from multiple storage arrays to a single new storage array every three or four years very cost-effectively. This has become a real customer use case as storage capacity of disks is increasing so quickly.

The Fan out model is essentially the opposite of the fan-in model. With this license, customers can migrate from a single storage array to multiple storage arrays by using a single array license.

Extend the MPX200 to perform continuous mirroring

In this example, the flexibility of the MPX200 with data migration could support continuous mirroring by leaving a migration job active for each LUN you want to mirror from three storage arrays to one storage array or from one storage array to three storage arrays. This is a fan in model of 3:1 and a fan out model of 1:3. The MPX200 offers support for 256 parallel migration jobs, each with its own pair of source and target LUNs that can be on either the same array of different arrays. Cross migration or bidirectional mirroring is also possible. The MPX is an intelligent data mover with split write capability.

* **Note:** The 3-ARRAY license pack is essentially three SINGLE-ARRAY licenses at a reduced discount. This license is for customers who are planning on during multiple migration jobs in their data center and using the MPX200 as a migration tool.

Quick backup using MPX200 (offline migration) can help you:

- Configure MPX200 in the SAN
- Bring in backup array—example: MSA P2000
- Create snapshot LUN on EVA and present it to MPX200
- Use MPX200 to move data (snapshot) to backup array
- Delete the snapshot on EVA immediately after backup completes to reduce host I/O throttling due to pending snapshot on parent virtual disks of EVA
- Free up EVA controllers from maintaining long term snapshots

You require only one data migration license transfer utility (LTU) on the target. LTU for the source is not required.

Deliver an ideal solution for any size data center

The MPX200 Multifunction Router solution is well-suited for entry-level, mid-range, and enterprise-class data centers.

Entry-level storage: Ideal for smaller deployments, including small-to medium-sized organizations or remote office locations of larger companies. For smaller companies, iSCSI becomes even more popular as server connectivity is essentially free (NICs are included in the server). For data migration, the TB licenses present good value.

Mid-range storage: For small to large data centers running key business applications, the MPX200 offers scalability to multiple terabytes of capacity, high performance data throughput, and a fully integrated suite of centralized management tools for greater administrative control.

Enterprise-class storage: For enterprise-wide deployment and mission-critical applications, the MPX200 is extensible and resilient. The solutions feature extensible, resilient, and controllable storage, enhanced scalability, improved performance unmatched data protection, disaster-tolerant solutions, and a fully integrated suite of centralized management tools.

Prepare your business for the future

Data mining, business analytics, business intelligence, disaster recovery strategies, and metadata management continue to fuel the demand for data migration technology. Moreover, businesses now have to be concerned about regulatory compliance for which they are required to store data for long periods while keeping it accessible.

We can help you freely move data around its systems without impacting application performance or disrupting your business. And this is how we make it possible.

The MPX200 can enable you to migrate your data at a very high speed between heterogeneous storage arrays using a user-friendly data migration GUI or CLI, or both. With the unique fan-in/fan-out pricing model, you can migrate data off multiple storage arrays to a single storage array, or vice versa, in a cost-effective manner and migrate normal-provisioned storage to thin-provisioned storage. You can also deploy the MPX200 to provide iSCSI connectivity and perform data migration simultaneously. All of this can be accomplished while reducing application downtime.

You can extend SAN advantages with the MPX200 Multifunction Router if your business is mid-sized or if you are a large IT organization that needs to run a large number of applications on blades or virtual servers using iSCSI connectivity to EVA arrays.

Global citizenship at HP

At HP, global citizenship is our commitment to hold ourselves to high standards of integrity, contribution, and accountability in balancing our business goals with our impact on society and the planet. To learn more, visit **www.hp.com/hpinfo/globalcitizenship/**, and for information about the HP Eco Solutions program, go to **www.hp.com/ecosolutions**.

HP Services

HP Technology Services—consultants and support experts to solve your most complex infrastructure problems, boost availability and avoid downtime, with your HP solution.

Recommended services

3-Year HP Support Plus 24 Service: Provides integrated hardware and software support services designed specifically for your technology. HP Services engineers deliver reactive onsite hardware support and over-the-phone software support around-the-clock.

HP Storage and Data Migration Services
http://h20219.www2.hp.com/services/us/en/consolidated/infrastructure-storage-data-migration.html

For more information about HP services, visit **www.hp.com/hps/storage**.

To find out how you can seamlessly migrate your data or consolidate your storage by using the HP StorageWorks MPX200 Multifunction Router, visit **www.hp.com/go/mpx200**.

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