Business continuity and the HP StorageWorks XP12000 Disk Array white paper

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Executive summary

Effective business continuity and disaster recovery solutions are critical to organizations operating in 24 x 7 environments. These organizations must meet requirements for business continuity testing and make effective operational use of multiple data centers and heterogeneous IT infrastructures.

This white paper highlights several key challenges that large enterprises face in real-world business continuity environments, particularly when business and regulatory requirements mandate long-distance replication of business information.

It also introduces a new universal data storage and replication platform from HP. The HP StorageWorks XP12000 Disk Array helps customers meet business continuity challenges cost-effectively, while protecting and leveraging existing technology investments. It also enables enterprises to increase service levels while reducing management complexity and operational risk.

For business continuity applications, the key features and benefits of the XP12000 Disk Array include:

- Management of externally attached, heterogeneous disk storage—enabling data migration and replication to lower-cost disk when appropriate, and providing consistent tools and procedures for operational resilience
- Replication with data integrity and consistency—based on the proven technology of HP StorageWorks Continuous Access XP, and now extended to heterogeneous storage and server platforms with the XP12000 Disk Array
- New long-distance replication capabilities—using disk-based journaling to increase resilience, while improving performance of production applications and reducing costs
- Advanced multi–data center configurations—intelligently combining synchronous and asynchronous replication technologies to meet business needs more effectively, and at lower cost

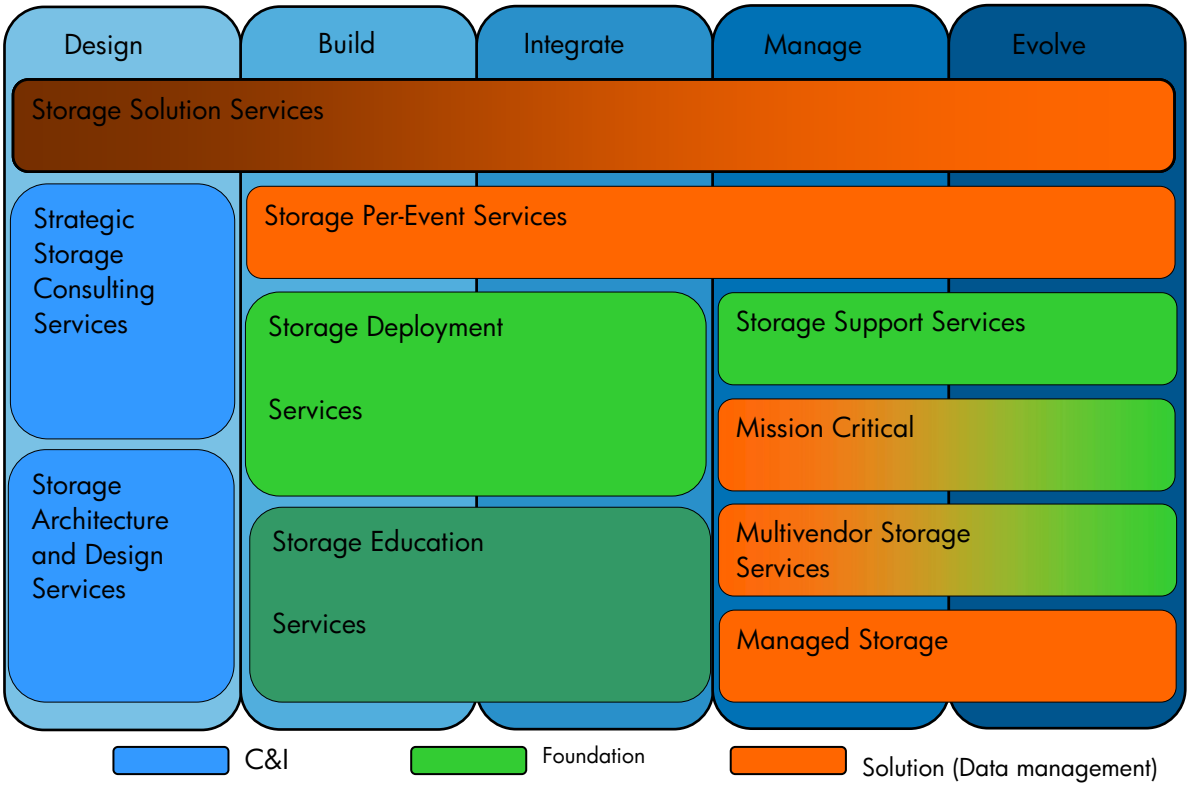
This paper illustrates the application of these new technology choices to meet enterprise needs cost-effectively in a number of scenarios, including business continuity testing, backup operations, and data lifecycle management.

Introduction

Business continuity is a matter of increasing concern to enterprises today as they respond to external threats and operational risks—and to more stringent demands from corporate stakeholders and government regulatory agencies.

Business continuity involves management and technology strategies that maintain required service levels for essential business functions and processes, preventing or minimizing interruptions caused by planned or unplanned events. Business continuity planning typically focuses on data protection and availability, in addition to business-critical processes, skills, logistics, and recovery execution. Technology capabilities for business continuity often include high-availability infrastructure at primary production locations, combined with disaster recovery capabilities at one or more remote sites. Figure 1 illustrates the key components of a robust business continuity storage services portfolio that combines local high availability and remote disaster recovery capabilities in a centrally managed infrastructure.

Figure 1. Business continuity storage services portfolio



This white paper introduces new business continuity capabilities supported by the HP StorageWorks XP12000 Disk Array, including cost-effective local and remote data protection and replication solutions.

The XP12000 Disk Array combines proven hardware and software with important technology innovations, enabling consistent and universal solutions to business continuity challenges and related business needs.

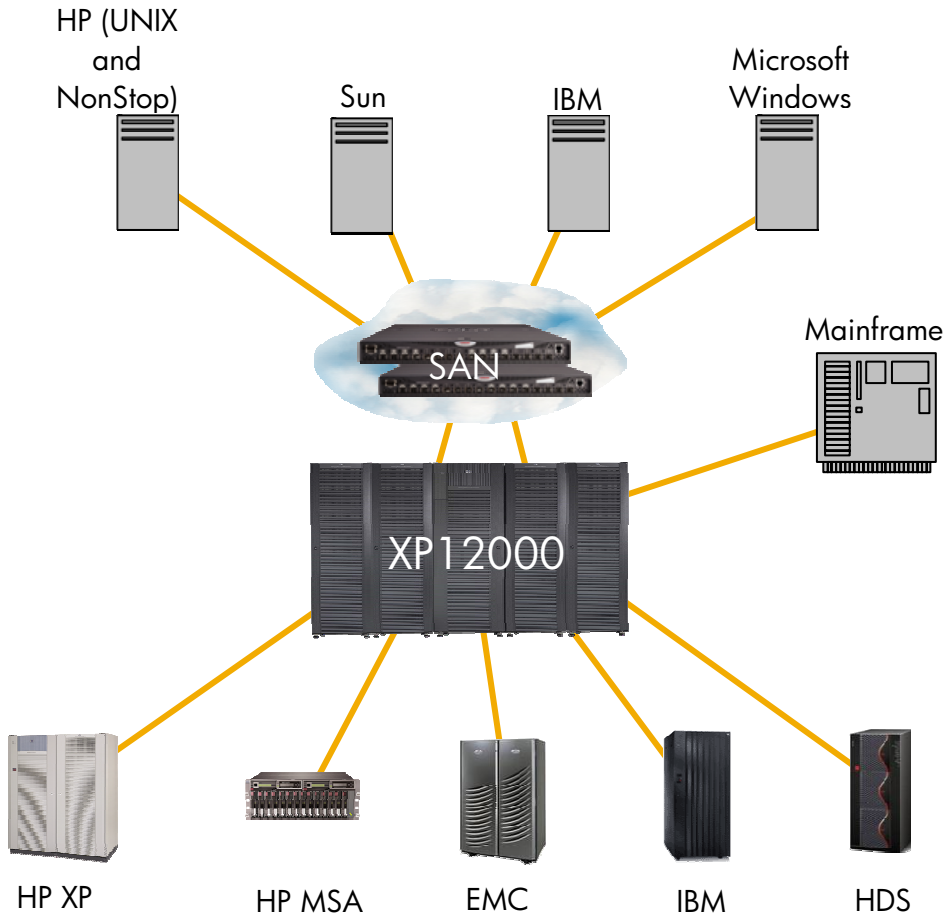
These business needs include technology management objectives, such as matching tiers of storage with application requirements across the enterprise—enabling organizations to satisfy service-level agreements with cost-effective solutions and a consistent approach to storage management.

This consistent approach makes a strong contribution to operational resilience by supporting reliable application of core processes, skills, and technology. Consistent platforms and technology management processes help enterprises build robust organizational capabilities to manage and absorb change and to respond effectively to new threats and opportunities.

HP StorageWorks XP12000 Disk Array overview

The HP StorageWorks XP12000 Disk Array is a combination of proven hardware and software technology that delivers universal data and storage services across heterogeneous platforms.

Figure 2. The HP StorageWorks XP12000 Disk Array



The XP12000 Disk Array enables customers to meet their service-level and business continuity objectives—reducing cost, complexity, and risk while protecting and leveraging existing technology investments.

The XP12000 Disk Array is the newest enterprise storage offering from HP—even bigger, faster, and more powerful than the successful HP StorageWorks XP1024 Disk Array. It uses third-generation XP12000 Disk Array crossbar switched architecture to support up to 2 million IOPS. Its larger cache—up to 256 GB—combines with as much as 81 GB/sec of internal bandwidth and improved algorithms to deliver industry-leading scalability and performance.

Heterogeneous storage pooling

HP StorageWorks XP12000 Disk Array supports up to 330 TB of internal storage. It also provides heterogeneous multi-protocol connectivity—up to 192 physical ports that can handle Fibre Channel, network attached storage (NAS), ESCON, FICON, or iSCSI—each of which can be presented in as many as 1,024 virtual connections. Up to 30 PB of externally attached storage can include XP Disk Array systems, HP StorageWorks Enterprise Virtual Arrays, modular storage systems (including HP StorageWorks Modular Smart Array [MSA]), and supported disk storage systems from other vendors, including IBM, EMC, Hitachi, and Sun.

With its multi-platform connectivity and its virtualized, heterogeneous storage pooling, the XP12000 Disk Array is the first intelligent storage platform to deliver industrial-strength virtualization, replication, migration, and management capabilities. It provides a consistent management platform for simplified configuration, multi-protocol connectivity, common path management, and enhanced security. It supports software that maps application requirements to storage attributes to deliver required quality of service from multiple tiers of storage, in part by leveraging a universal replication and data movement engine. The XP12000 Disk Array thus provides the foundation for a consistent, universal approach to data lifecycle management, business continuance, and HP Application Solutions for storage.

Data movement and data protection capabilities

Data movement is the key to business continuity and to cost-effective tiered storage management. Enterprises must have common means of moving data up and down tiers of storage to enable HP Application Solutions for storage for production, test, and archiving environments. And for disaster recovery, organizations must have consistent tools and capabilities for replicating and recovering corporate data.

The HP data movement software modules offer several important capabilities:

- Full volume copy using HP StorageWorks Business Copy XP
- Space-efficient volume copy using HP StorageWorks Snapshot XP
- Synchronous and asynchronous replication with HP StorageWorks Continuous Access XP
- Data movement between storage tiers using HP StorageWorks FlexCopy or (with XP12000 Disk Array) using Business Copy XP
- Efficient, cost-effective replication and recovery with HP StorageWorks Continuous Access XP Journal (exclusive to XP12000 Disk Array)
- Common access to data movement products through HP StorageWorks Command View XP and APIs

The XP12000 Disk Array supports all these capabilities and more. (For a more detailed list, see the Appendix). These products and services can be combined to meet specific business continuity requirements and operational needs.

HP StorageWorks Continuous Access XP Journal for HP StorageWorks XP12000 Disk Array

For business continuity and related business requirements, HP StorageWorks XP12000 Disk Array delivers an important new capability: HP StorageWorks Continuous Access XP Journal software. This software will ultimately support real-time replication for all internally and externally connected disk storage volumes, making it a very powerful solution for remote-copy operations.[1] Continuous Access XP Journal software provides a consistent replication approach and enables a common set of procedures, tools, and skills to manage diverse, heterogeneous storage and application environments.

This software complements existing data protection, data movement, and business continuity products from HP, and the XP12000 Disk Array will make these capabilities available for management and protection of externally attached, heterogeneous storage resources. Thus, XP12000 Disk Array with Continuous Access XP Journal software supports the data replication and movement requirements of disparate applications and business processes.

Continuous Access XP Journal software differs from other solutions in that it *pulls* the data to the remote site, instead of *pushing* it from the primary site. The primary storage system writes data to its own journal volumes, but the replication engine that controls asynchronous replication is located on the remote system. This approach shifts most of the replication workload to the remote site, reducing resource consumption on the primary storage system and improving production application performance. In effect, this software restores primary site storage to its intended role as a transaction processing resource, not a replication engine.

Continuous Access XP Journal software, running on the HP StorageWorks XP12000 Disk Array, delivers several important benefits:

Building on a proven legacy of data integrity and consistency. Continuous Access XP Journal software uses technology proven reliable in Continuous Access XP. Each transmitted record set includes sequence-number information, enabling the replication engine to verify receipt of all records at the remote site and to arrange them in the correct write order for storage.

Liberating resources and improving performance. By using local disk-based journaling and a pull-based remote replication engine, Continuous Access XP Journal software releases critical resources that are consumed by other asynchronous replication approaches at the primary site—such as disk storage cache in storage-based solutions, or server memory in host-based software approaches. Continuous Access XP Journal software improves cache utilization, lowering costs and improving performance of production transaction applications.

Improving resilience and data integrity. With Continuous Access XP Journal software, operations can survive temporary communication problems for longer periods without data loss. Should the replication link fail between sites, Continuous Access XP Journal software keeps logging changes in the local journal so that they can be transmitted later, without interruption to the protection process or the application. Data consistency is preserved, and the user can maintain a more current recovery point objective (RPO) during outage situations, compared with existing replication methodologies.

Controlling bandwidth costs and RPO. With Continuous Access XP Journal software, the remote storage system pulls data from the primary journal volumes over the data replication network as fast as the bandwidth allows. If available bandwidth does not support optimal replication—for example, during peak-load spikes in transaction volume—the primary journal volumes buffer the data on disk until more bandwidth becomes available. Users can improve bandwidth utilization and lower their communication costs by sizing bandwidth for average bandwidth needs—not for peak usage. This simplifies bandwidth planning and empowers users to better control their RPO in relation to infrastructure and communication costs.

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[1] Customers should check with their HP representatives regarding the scheduled availability of HP StorageWorks Continuous Access XP Journal support for externally connected disk storage systems from other vendors.

Managing storage costs. Continuous Access XP Journal software can replicate to and from externally attached, lower-cost disk storage. The journal volumes must be located within the XP12000 Disk Array, but the data volumes can be located on externally attached storage. This capability enables enterprises to stretch budgets through lower acquisition costs or leverage existing storage systems to enable more complete and resilient disaster-recovery configurations.

Multi-data-center operations. Continuous Access XP Journal software, in combination with synchronous Continuous Access XP replication, supports improved performance and cost reduction in multi-site business continuity configurations. These advanced solutions can use fewer intermediate copies than alternative approaches, while placing the copies on less expensive storage and reducing resource consumption at the primary site.[2]

Business continuity challenges

Business continuity operations and testing

Business continuity requires effective primary-site and remote-site capabilities for normal operations and tested procedures for recovery from planned and unplanned outages. Regular business continuity testing is critically important, but it remains a challenge for most organizations—especially those that must manage a heterogeneous server and storage infrastructure.

Large amounts of data may need to be copied or migrated to multiple sites, and the task of disaster response teams and IT staffs is made more difficult by the need to execute unique technical procedures for each hardware platform using different tools and management consoles. Introduce changes to the applications or infrastructure and a task that was difficult even in a stable IT environment gains even more complexity through the introduction of new risks and unexpected outcomes.

Introduce the need to support data replication to multiple data centers and the challenge is greater yet. Coordinating replication to multiple sites while guaranteeing data integrity over any distance with advanced recovery capabilities—and the strenuous bandwidth considerations that come with it—is the apex of difficulty.

As a result of all this, most organizations fail to adequately test their disaster recovery plans on a regular basis. It just seems too complex and expensive. And it is difficult to keep everyone current on the skills and procedures needed for effective recovery operations. Yet increased regulatory pressures and heightened corporate governance in the face of new threats are escalating the need for such testing.

The HP StorageWorks XP12000 Disk Array's simplification of disaster recovery—by way of the application of a single replication technology universally across heterogeneous platforms and amelioration of the bandwidth issues associated with long-distance replication—makes regular and comprehensive disaster recovery testing more feasible and affordable.

[2] For a more detailed discussion of HP StorageWorks Continuous Access XP Journal software capabilities and configurations, see the *HP StorageWorks Continuous Access XP Journal Advanced Technology white paper*.

Maximizing uptime, productivity, and ROI

Business continuity must be more than just insurance against disaster. Ideal approaches will also eliminate downtime associated with system upgrades and scheduled maintenance by transferring primary processing to the secondary site during those periods. Similar approaches enable secondary access to current data for activities such as change control and application testing—without impacting regular production workloads. HP Application Solutions for storage thus accommodate temporary, special-purpose, and changing workloads with appropriate storage configurations, using flexible data movement and replication capabilities combined with a range of cost-effective storage choices.

Backup and recovery

In many IT organizations, backup is still the number one headache. Backup windows are shrinking or have long since disappeared. Single-file restore requests take too much time and energy to fulfill. Disk-to-disk (D2D) backup solutions—using cost-effective disk storage such as the MSA or EVA systems—are helping meet these needs. However, tape is still needed for long-term archiving and disaster recovery vaulting. And migrating data to a remote backup site is particularly complex when each platform requires unique data movement tools and procedures.

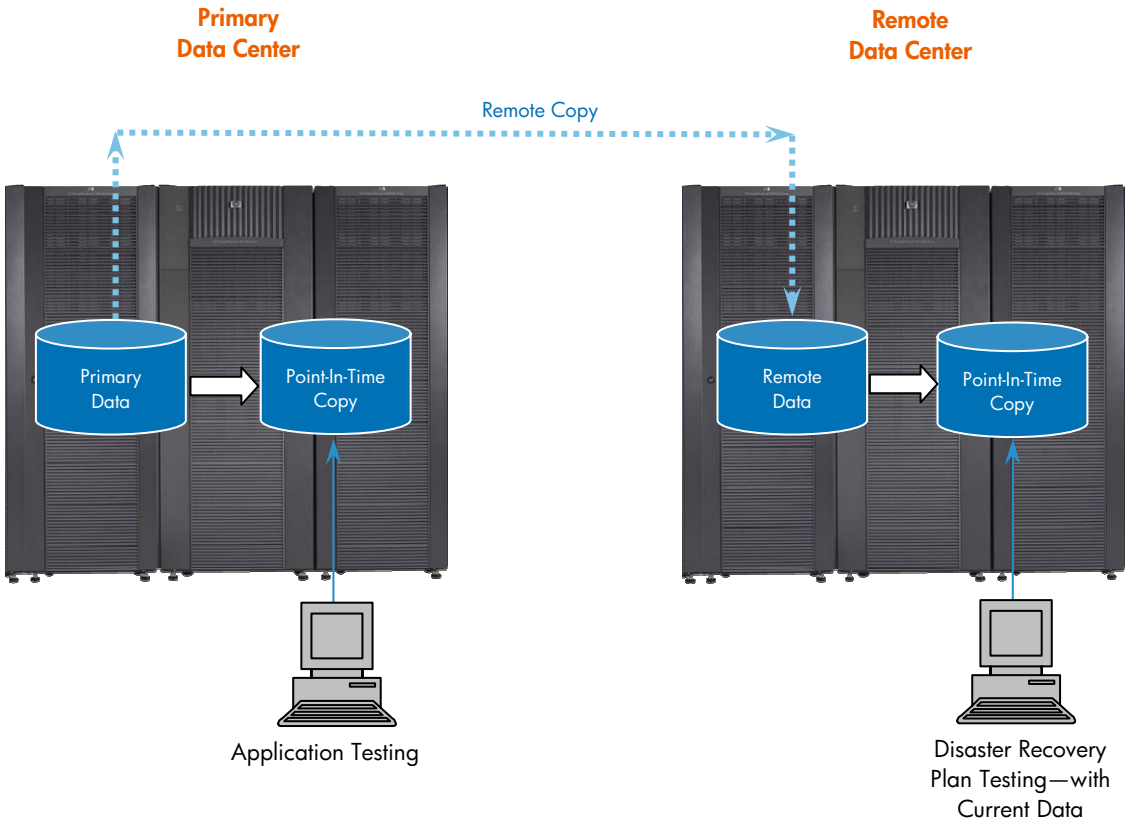
Application examples

The HP StorageWorks XP12000 Disk Array provides effective solutions for the major business continuity challenges. The following application examples illustrate the power of this innovative technology platform to help reduce business risks, lower IT costs, and eliminate IT headaches.

Case 1. Business continuity operations—Two data centers

HP offers powerful solutions for business continuity as well as for disaster recovery testing while maintaining complete disaster recovery protection. Figure 3 illustrates a typical configuration that uses HP StorageWorks Continuous Access XP software to maintain an exact, I/O consistent data volume at the remote site. It also uses HP StorageWorks Business Copy XP software to create a separate copy for disaster recovery testing. This enables the organization to test its disaster recovery plan with current data.

Figure 3. Business continuity and data recovery testing with two data centers



Enterprises use solutions such as Continuous Access XP, Continuous Access XP Extension, or Continuous Access XP Journal software to create a remote copy for disaster recovery. Business Copy XP software provides point-in-time copies for testing.

Business continuity operations. HP StorageWorks XP12000 Disk Array and its replication software provide several simple but effective improvements to this scenario. For business continuity operations, the primary storage volume can live on any storage system attached to XP12000 Disk Array, and the secondary volume can live on any storage system attached to the remote XP12000 Disk Array.

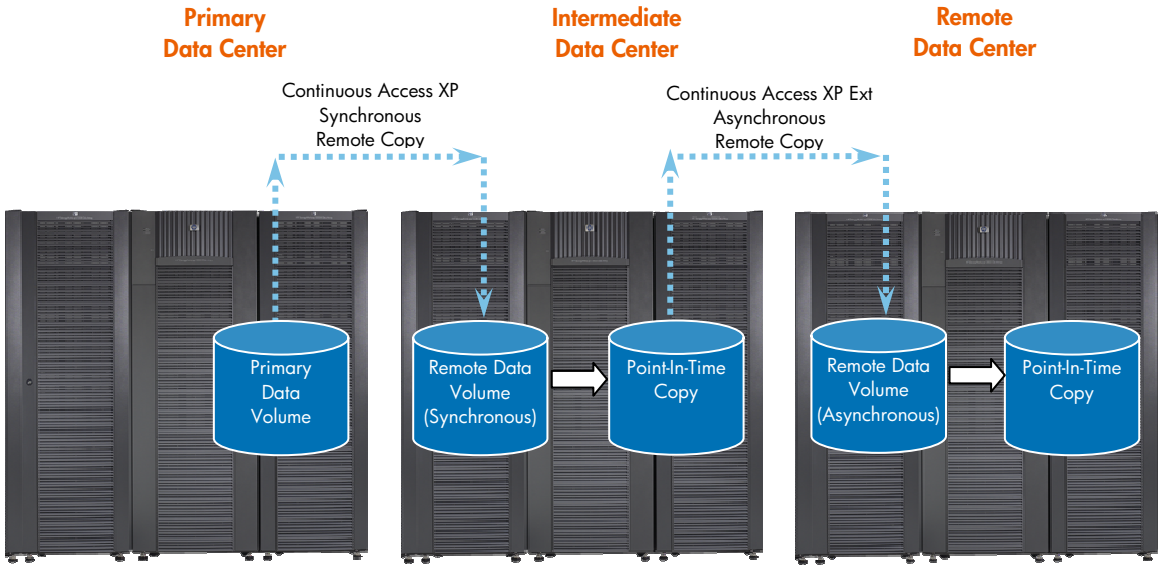
Thus, a single tool can perform replication at storage system speeds among systems with different native replication tools. Also, in the case of Continuous Access XP Journal software, the benefits of pull rather than push replication—along with elimination of the need to dedicate large amounts of cache—radically improve transaction performance at the originating site.

Business continuity testing. For disaster recovery testing, the remote XP12000 Disk Array can create a point-in-time copy on its internal disk storage—or on any externally attached storage system. Organizations can easily direct current copies of production data to inexpensive or legacy storage, enabling more complete and cost-effective disaster recovery testing.

Case 2. Business continuity operations—Three data centers

For business-critical applications and data, many organizations have considered or adopted a three data center (3DC) replication model. In the 3DC model, synchronous replication—which can achieve a copy that is fully current at all times over limited distance—is employed between the primary data center and a nearby hot site. The data is then replicated to a geographically remote site using asynchronous replication, which works over any distance. In the event of a local disaster, customers have the option of recovering to the intermediate site (if it has appropriate computing and staff resources), or to the remote site with some catch-up delay. In the event of a disaster geographically broad enough to impact the primary and intermediate sites, recovery is still possible by failing over to the remote site with some delay and some data loss. Thus, a 3DC configuration provides the best combination of protection against disaster with minimal data loss and downtime.

Figure 4. Traditional disaster recovery with three data centers

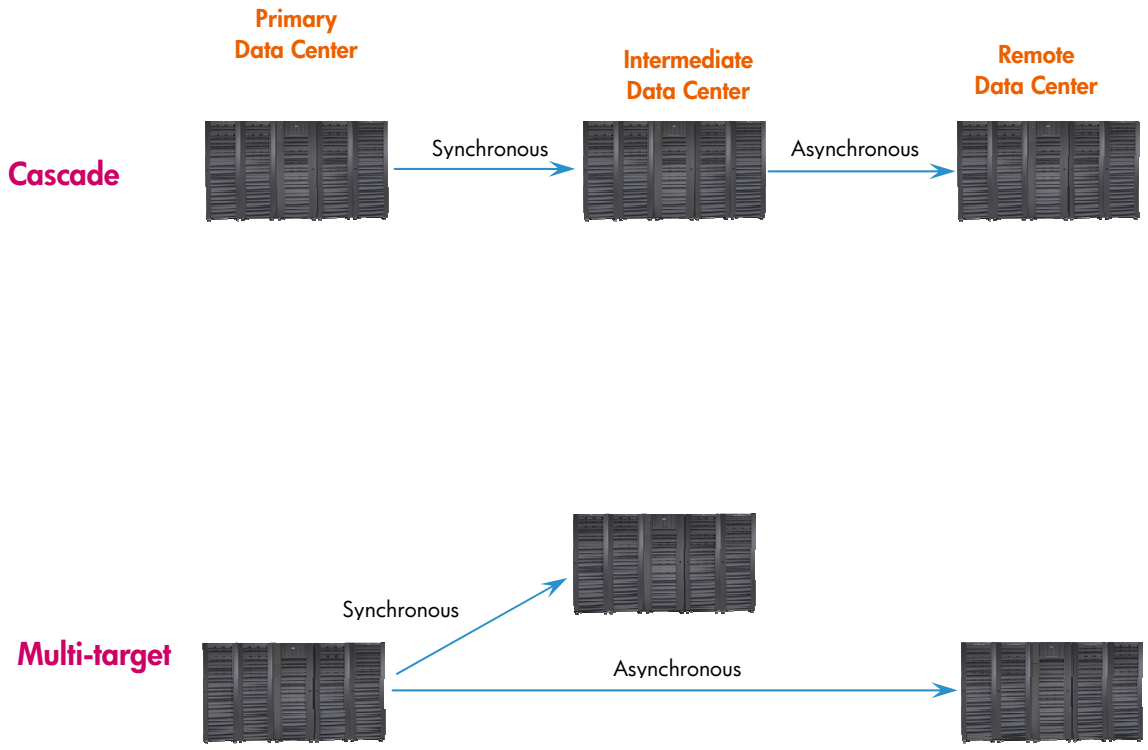


Existing 3DC solutions. Before the XP12000 Disk Array and the Continuous Access XP Journal software, HP would implement 3DC using Continuous Access XP and Business Copy XP software to support both synchronous and asynchronous capabilities between pairs of XP1024 Disk Array storage systems (Figure 4). This advanced configuration required significant investment, and was most cost-effective in large enterprises where a few lost transactions could cause serious financial losses. Other enterprises decided to avoid the investment and live with the risks. However, today's increased risks and regulatory scrutiny are prompting these companies to take another look at advanced business continuity protection. And new solutions are bringing these capabilities into reach for more organizations.

Improved 3DC solution. With its introduction of the XP12000 Disk Array, HP offers additional replication choices that reduce the cost of a 3DC configuration, making this approach affordable for a broader range of enterprises and applications. XP12000 Disk Array actually supports the previously described configuration using Continuous Access XP and Business Copy XP software, yet it also supports a simplified, more cost-effective solution using Continuous Access XP Journal software.

With the XP12000 Disk Array, combinations of Continuous Access XP and Continuous Access XP Journal software enable different 3DC configurations—cascade and multi-target.

Figure 5. Enhanced 3DC replication configurations with Continuous Access XP Journal software



Enterprises can choose among different 3DC replication configurations, depending on business needs. 3DC cascade provides complete data copies at intermediate sites that support server clusters and application failover. Multi-target configurations offer the best protection against local and regional disasters, at higher cost.

XP12000 Disk Array provides a "no data loss" solution with less complexity, scripting, and overhead than previous solutions. For an example 3DC configuration, see case 5 in this white paper. For a more detailed discussion of advanced 3DC configurations enabled by Continuous Access XP Journal software, see the *HP StorageWorks Continuous Access XP Journal Advanced Technology white paper*.

Business continuity testing. For disaster recovery testing, the remote site's XP12000 Disk Array can create a point-in-time copy with Business Copy XP software on its internal disk storage—or on any externally attached storage systems, such as the HP StorageWorks family systems with the MSA or other available storage.

By providing more cost-effective remote replication and enabling customers to use externally attached storage in business continuity configurations, the XP12000 Disk Array makes 3DC configurations and full disaster recovery testing more affordable. Enterprises can conduct business continuity testing more frequently, helping to ensure that disaster recovery plans and procedures are kept current and effective.

Bottom line: By providing a consistent management interface for all the data replication functions—across multiple sites and *tiers of storage and replication*—the XP12000 Disk Array reduces management costs, minimizes planned and unplanned downtime, and greatly improves ROI.

Case 3. Change control and application testing

Change control and application testing are important elements of business continuity and operational resilience. Enterprises much prefer to discover software and configuration problems on a test system, not in production.

For simple changes, an isolated test of a single application or system may be sufficient. However, larger and more complex systems can produce unexpected results when scaled up for production with real application data. In such a situation, the best practice is to conduct a full test at production scale, with all parts of the system processing real data.

In the past, this approach to comprehensive testing might have been too complex to configure, or too expensive and disruptive to stage on the available infrastructure. HP StorageWorks XP12000 Disk Array makes this kind of testing simpler to manage and more affordable to execute. An administrator can use HP StorageWorks Business Copy XP software to create a copy of production data for testing.

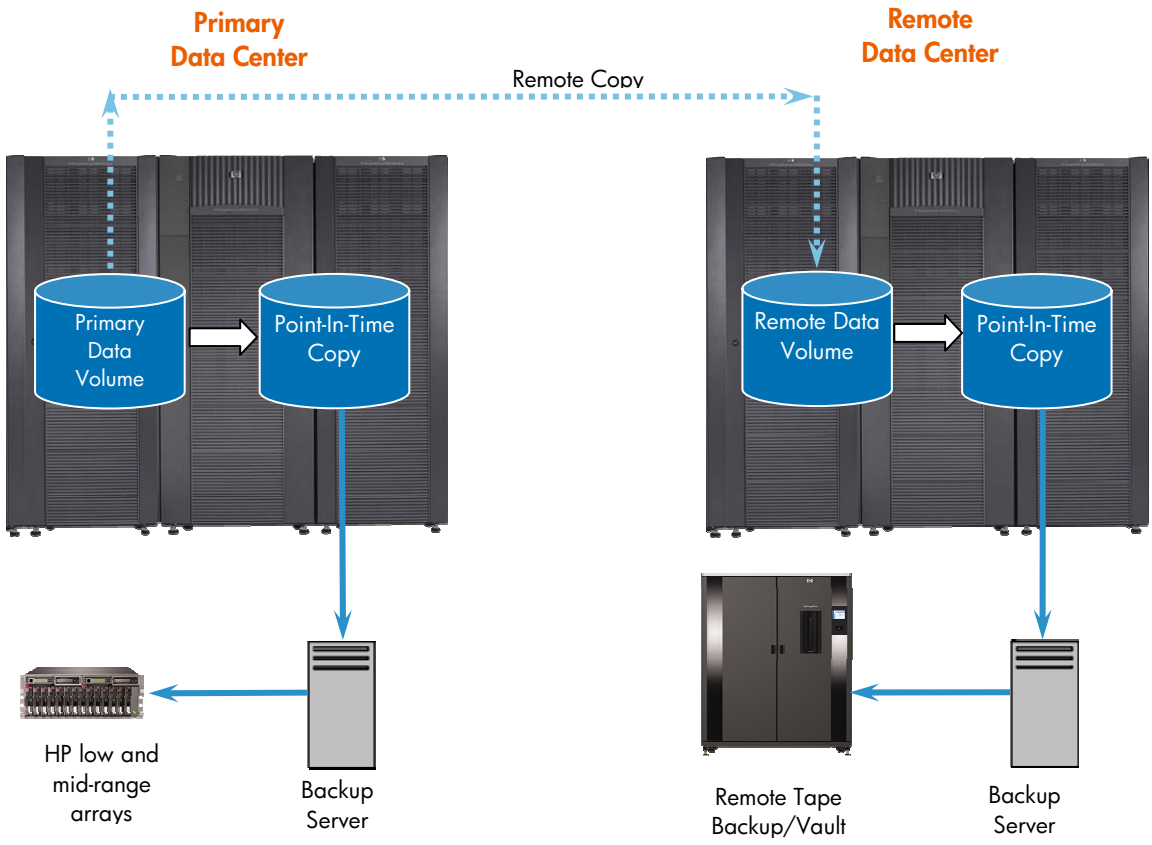
With the HP StorageWorks XP family product lines, Business Copy XP software creates the secondary copy on a volume inside the storage system. XP12000 Disk Array offers even more flexibility: the target volume can be located internally, or on any externally attached storage system using External Storage XP. For example, XP12000 Disk Array can place the test data on a low-cost disk storage system, and can then present that volume to a separate test server. By running the test on a separate server, connected to separate storage volumes, the enterprise reduces the risk of corrupting production data or interfering with production server workloads. This approach to application testing leverages the easy connection capability provided by XP12000 Disk Array—shared access to pooled storage resources—along with its ability to utilize externally attached disk storage to optimize cost and performance.

Case 4. Improving backup and recovery for data protection

While many enterprises maintain disaster recovery copies of critical data on disk or tape at a remote site, they also keep local backup copies at their production data centers. These local copies are essential for quick recovery from hardware or software problems, and are typically more accessible to operations staff than the remote copies may be. Also, access to remote copies can be compromised by interruptions that impact the remote site or the communication links.

As backup windows shrink to zero, and the cost of disk storage continues to fall, many organizations are adopting D2D backup strategies. Figure 6 illustrates an approach that leverages HP StorageWorks XP12000 Disk Array capabilities to provide fast, cost-effective local backup to disk—and also supports tape backup and archiving at the remote site.

Figure 6. Local and remote backup configurations



XP12000 Disk Array provides remote replication and point-in-time copy capabilities—including HP StorageWorks Continuous Access XP Journal and HP StorageWorks Business Copy XP software—that enable cost-effective backup to tape or to disk.

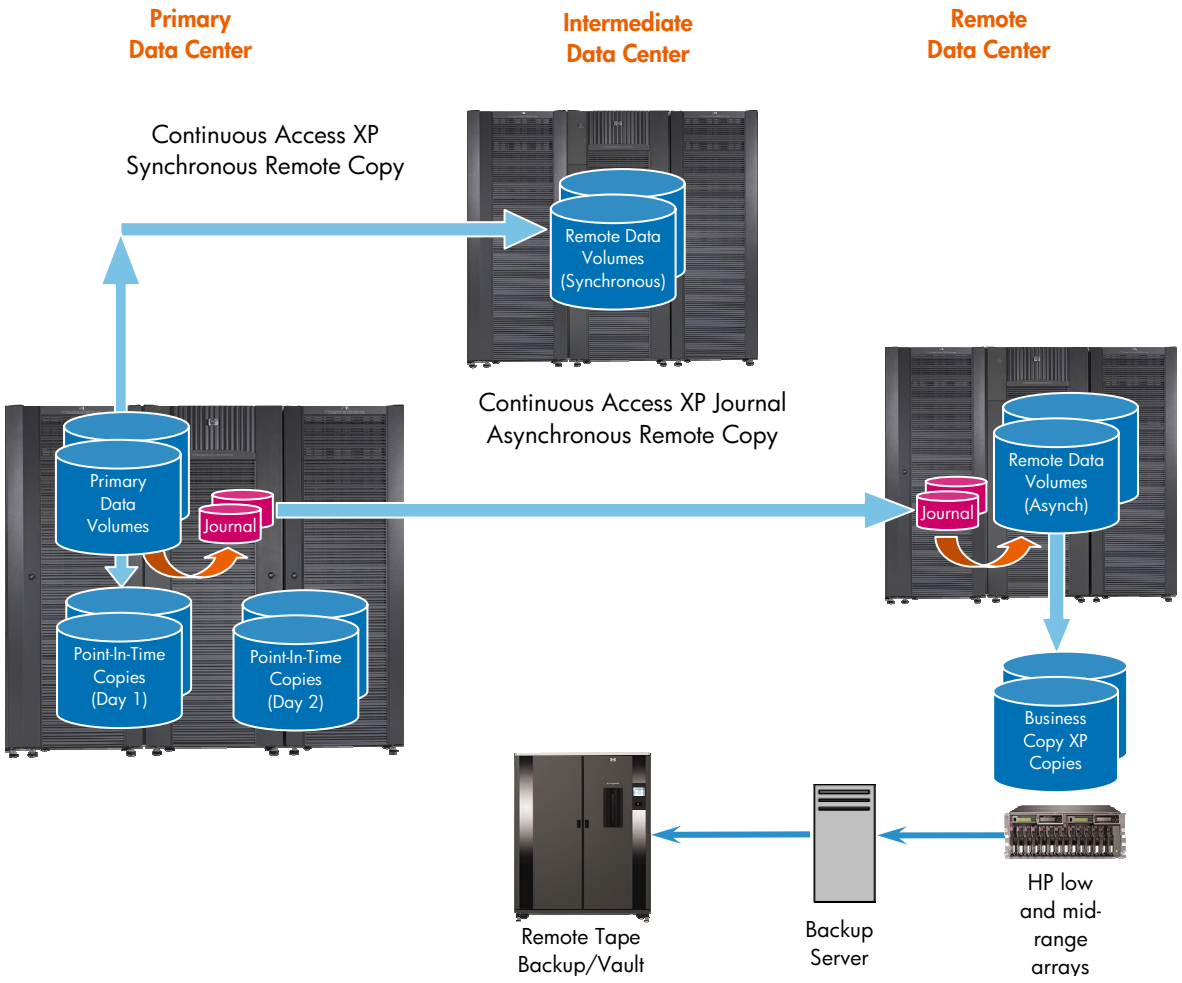
In this example, the XP12000 Disk Array uses Business Copy XP software to create a point-in-time copy of the production volume that is scheduled for backup. Next, a backup software application, such as HP OpenView Storage Data Protector, reads the point-in-time copy and writes the backup files to the inexpensive HP StorageWorks Modular Smart Array 1500 (MSA1500). At the remote disaster recovery site, a separate point-in-time copy—perhaps located on the HP StorageWorks family storage with the MSA1500—can support remote backup and archiving to disk or tape media when required. Depending on the backup software, data can be staged or moved according to different rules and with different levels of granularity.

With its ability to manage low-cost disk and leverage existing resources, and its support of the full suite of replication software from HP, the XP12000 Disk Array provides a common infrastructure for a wide variety of backup and recovery strategies. HP also offers professional services that help enterprises design, configure, and deploy solutions that meet their specific needs.

Case 5. A large financial services firm

Based on the applications environment and business continuity strategy of a large financial services firm, Figure 7 illustrates the power and flexibility of the HP StorageWorks XP12000 Disk Array and its data replication capabilities.

Figure 7. HP StorageWorks XP12000 Disk Array with consistency groups



Point-in-time copies for a large database. This organization creates daily point-in-time copies of its production online transaction processing (OLTP) database for use in an online decision support system (DSS) that requires current customer data. Since large DSS queries can run for 36 hours or more, this company maintains multiple DSS copies—making a new point-in-time copy every 24 hours, while allowing in-process jobs to complete on earlier DSS copies. The production database spans multiple data volumes, so this configuration uses Business Copy XP software to split off accurate point-in-time copies of a multi-volume consistency group. This approach enables the customer to create duplicate DSS copies with zero impact to production OLTP applications. Incidentally, this customer has determined that the financial benefits of running DSS queries on current data—rather than two-day-old data—more than justify the cost of maintaining two full DSS copies of the production database.

3DC replication. To support its business continuity needs—including regulatory agency guidance on out-of-region disaster recovery capabilities—this company has selected an advanced 3DC replication solution from HP. In this solution, Continuous Access XP software maintains an exact, synchronous copy of the production OLTP data at an in-region disaster recovery hot site 20 miles away. Continuous Access XP Journal software separately maintains an asynchronous copy at the remote disaster recovery site—more than 1,000 miles away.

Compared to a cascade approach, this configuration eliminates the potential of having no disaster recovery should the intermediate site fail. These configurations are discussed in further detail in the *HP StorageWorks Continuous Access XP Journal Advanced Technology white paper.*

Backup and testing. This business continuity configuration also uses XP12000 Disk Array capabilities to make copies of data on lower-cost, externally attached storage such as the MSA1500. These copies can be used for D2D or disk-to-tape backup, and for additional purposes such as disaster recovery testing. The advanced 3DC configuration also supports rapid production takeover at the remote site—in less than two hours—when required for operational recovery, full disaster recovery testing or scheduled upgrades, and configuration changes.

As this case study illustrates, the advanced capabilities of the XP12000 Disk Array provide a robust and powerful foundation for meeting the requirements of large organizations with complex needs in production, development, testing, archiving, and business continuance—and for retaining and protecting information throughout its lifecycle.

Conclusion: Toward operational resilience

A strong business continuity strategy is an essential component of a broader business resilience program, which builds robust organizational capabilities to anticipate and respond effectively to changes, threats, and opportunities.

By using the HP StorageWorks XP12000 Disk Array and HP Application Solutions for storage capabilities to manage heterogeneous disk storage resources, enterprises can apply consistent procedures, skills, and training across all their storage platforms. Rather than maintaining separate procedures and skills for data replication and recovery on each storage platform, the organization applies one powerful and consistent set of replication capabilities and storage management tools to all its disk storage resources.

In a disaster recovery scenario, the risks of error are lower when the procedures are consistent across all platforms. It is also easier to ensure that the required skills are always available when needed for recovery of critical business applications and data.

The XP12000 Disk Array supports consistent user interfaces and powerful automated storage management capabilities for managing heterogeneous storage. Combined with the broad range of HP products and professional services, it enables enterprises to build consistent, policy-based approaches to business continuity, data lifecycle management, and operational resilience.

Looking ahead, operational resilience requires more than data protection and availability—it must also include capabilities to leverage data and infrastructure to detect and anticipate changes, and to align service levels and costs with application requirements as they change over time. By integrating data management resources across multiple lines of business using a common set of management tools and processes, enterprises can extend the benefits of operational resilience to the full range of business functions and processes.

Appendix: HP software and services

This appendix provides summary descriptions of many data movement products and features supported by the HP StorageWorks XP12000 Disk Array, as well as professional services that assist customers to meet their business objectives for business continuity and operational resilience.

Customers should check with HP for the latest information on available products and services.

Software

HP StorageWorks Continuous Access XP Journal and HP StorageWorks Continuous Access XP

HP StorageWorks Continuous Access XP Journal and HP StorageWorks Continuous Access XP are high-availability data and disaster recovery solutions that deliver OS-independent real-time remote data mirroring between XP disk arrays. Continuous Access XP Journal extends capabilities to include asynchronous replication; Continuous Access XP provides synchronous replication. A variety of remote connectivity infrastructures can be deployed to facilitate array-to-array connections—ESCON, Fibre Channel, ATM, and IP.

HP StorageWorks Business Copy XP

HP StorageWorks Business Copy XP is a local mirroring product that maintains one or several copies of critical data through a split-mirror process. Asynchronous copy volume updates ensure I/O response time for primary applications is not adversely affected. It provides full-copy/clone or snapshot/space-efficient local replication. Nine simultaneous clone copies or 32 simultaneous snapshot copies can be concurrently maintained.

HP StorageWorks Snapshot XP

HP StorageWorks Snapshot XP is similar to Business Copy XP, except that is uses space-efficient logic to create copies that are a fraction of the size of the primary volume. It does this by only recreating the portions of the primary volume that have been rewritten. Portions of the primary volume that have not been rewritten are accessed from the primary volume.

HP StorageWorks FlexCopy

HP StorageWorks FlexCopy XP allows static point-in-time copies of XP array data to be copied to an external HP StorageWorks Modular Smart Array 1000 (MSA1000) disk array. This product facilitates high-speed backup (using the external MSA as an external backup "staging" device) or allows critical data to be "broadcast" out to multiple external MSA arrays for more efficient, low impact offline data operations.

Professional services

Overview

HP Global Solution Services (GSS) group provides professional services to help keep your data safe, preparing you to maintain business continuity during both planned and unplanned downtime. To keep your critical business operations up, running, and successful, GSS leverages unique experience acquired in implementing the most demanding data protection and disaster recovery solutions for a broad range of businesses. By applying superior data mirroring and replication capabilities, best-of-breed backup, the guaranteed resiliency of HP storage hardware, and proven connectivity architectures, GSS provides the continuity services that help you minimize downtime and speed recovery in the event of disaster.

For more information

www.hp.com/go/enterprisestorage

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