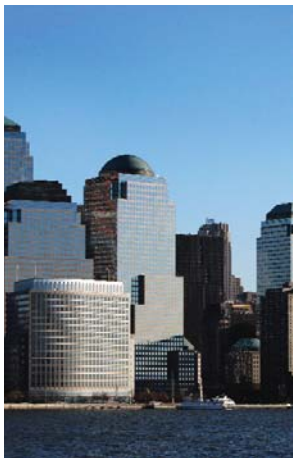
Business continuity solutions for concentration risk mitigation

A solution from HP



"Risk mitigation is the "holy grail" of all financial services executives. The ability of an organization to manage the downside risk of the financial markets relates directly to the overall competitiveness of that organization. A financial services firm that cannot properly manage financial risk will not survive."

Tabb Group, *Crisis in Continuity: Financial Markets Firms Tackle the 100 km Question*

In a post-September 11 marketplace, the financial services industry is uniquely vulnerable to "concentration risk," which derives from the historic location of financial operations in a handful of global financial centers, including New York, London, Frankfurt, Hong Kong, and Singapore. Within financial services institutions, the trading and settlement operations are the most vulnerable due to the tendency to cluster around exchanges and correspondents to facilitate communications.

Although technological advancements in telecommunications have freed trading operations from most limitations on real-time connectivity, many financial services institutions continue to maintain their primary operations in the financial centers. Institutions must address this exposure to ensure operational resiliency and stability. HP is assisting global institutions by designing and delivering backup data centers, office recovery centers, and secondary trading facilities for their regional and global operations. In addition, HP delivers a unique solution for asynchronous data replication to meet federal mandates for data center production and backup sites.

Setting business continuity objectives and best practices

Regarding business continuity in the financial services industry, the most influential effort undertaken by any governmental body has been the development of the *Interagency Paper on Sound Practices to Strengthen the Resilience of the U.S. Financial System*. This white paper, produced by the U.S. Federal Reserve Board, Office of the Comptroller of the Currency, and the Securities and Exchange Commission, changed the focus of business continuity and disaster recovery planning. Previously, many organizations had developed strategies for addressing limited outages. However, the interagency white paper stressed the importance of developing appropriate strategies that ensure the continuing functionality of markets in case of significant area-wide or regional disruptions.

The white paper also states that the following business continuity objectives have special importance for all financial services institutions and the U.S. financial system as a whole:

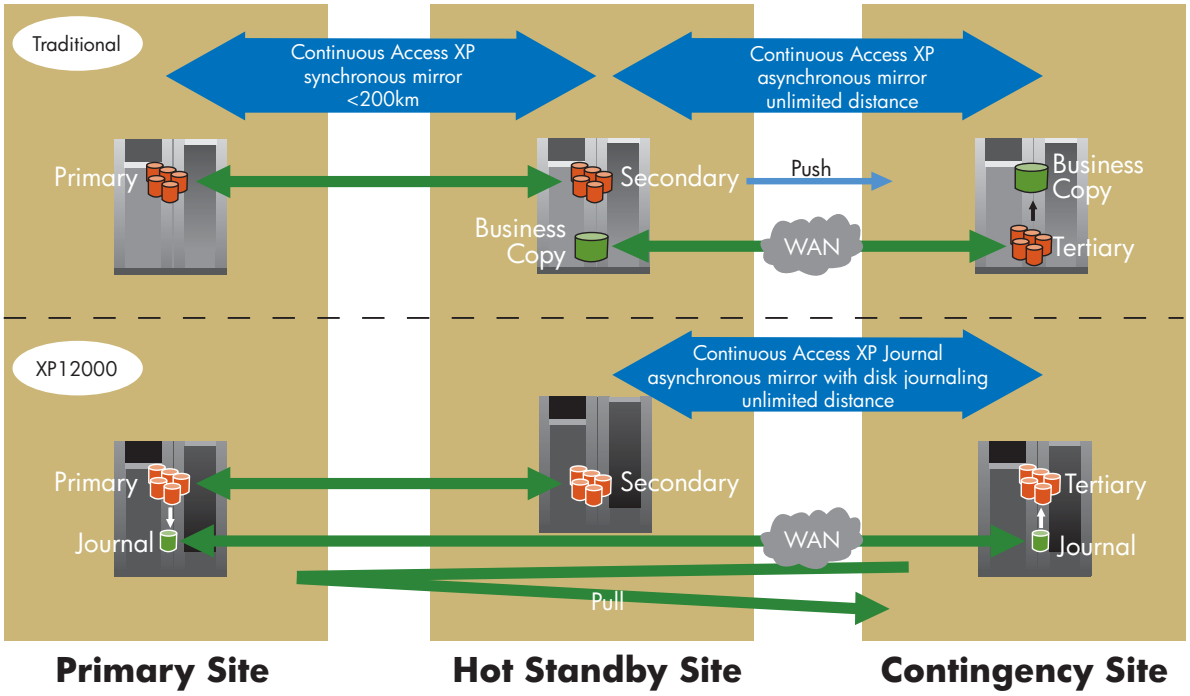
- Rapid recovery and timely resumption of critical operations following a wide-scale disruption
- Rapid recovery and timely resumption of critical operations following the loss or inaccessibility of staff in at least one major operating location
- A high level of confidence, through ongoing use or robust testing, that critical internal and external continuity arrangements are effective and compatible

However, instead of taking a regulatory approach to accomplishing these objectives, government agencies identified the following sound practices that financial services organizations can implement:

- Identify clearing and settlement activities in support of critical financial markets
- Determine appropriate recovery and resumption objectives for clearing and settlement activities in support of critical markets
- Maintain sufficient geographically dispersed resources to meet recovery and resumption objectives
- Use or test recovery and resumption arrangements routinely

invent

Figure 1. Networks for multisite disaster tolerance



The white paper has strongly influenced how institutions operate. Not only have institutions developed new strategies for ensuring the availability of critical data, applications, and systems, but they have also begun developing new strategies for ensuring that critical institutional functionality (such as clearing, settling, and trading) can be re-established in a minimal amount of time.

Multisite disaster tolerance

After September 11, the first change many large institutions made was relocating their primary IT production centers from their corporate or operational headquarters to a separate facility. Many institutions saw that by relocating their data centers, they could redistribute critical resources away from their corporate or operational headquarters and mitigate the risk associated with geographic centralization and concentration. In addition, by relocating the data centers, hot sites were also relocated, further mitigating risks.

Figure 1 provides an illustration of two multisite disaster tolerant networks. The multisite network shown at the top of the illustration features a traditional connection between the primary and the hot standby sites. The secondary disk array copies data and transmits it across a wide area network (WAN) to a tertiary server at the contingency site.

The multisite network featuring the HP StorageWorks XP12000 Disk Array is shown at the bottom of the illustration. This network similarly features a connection between the primary and the hot standby sites. In addition, the XP12000 employs journaling in the asynchronous communication process.

The role of data replication

Data replication is the process by which financial services institutions can quickly and accurately replicate all their critical data in the event of an IT disruption or other significant IT event. The technologies used to make this process work play an increasingly critical role in establishing business continuity.

Today, most institutions use a mix of networked mainframes, servers, clusters, and grid technologies that leverage storage area networks (SANs) and network-attached storage. These systems can replicate critical data in either real time or near-real time.

Data replication products are implemented based on specific distance and volume requirements. While each of the solutions provides the ability to replicate data, each has its own unique characteristics.

HP StorageWorks Continuous Access applications are fundamental to mission-critical environments. Here are some examples:

- **HP StorageWorks Continuous Access XP Synchronous** is an HP StorageWorks XP "array-to-array" mirroring product that provides synchronous remote replication. It is ideal for short-distance (50 to 200km [31 to 124 miles]) replication with full data currency on both the local and remote data centers.
- **HP StorageWorks Continuous Access XP Asynchronous** is an HP StorageWorks XP "array-to-array" mirroring product that provides asynchronous remote replication by holding any overflow data in an area of the cache called the sidefile. It provides an ideal solution for long-distance (over 200km [124 miles]) replication with no latency impact.

An HP successful deployment of Continuous Access XP Journal

Leading global financial services institutions have turned to HP for solutions to mitigate concentration risks around the world. HP provides an end-to-end solution that reduces this risk and assures single source accountability.

Challenges	Solution	Results
• Implement a robust fault-resilient multi data center production environment with a remote disaster site in accordance with federal mandates • Increase the level of command and control • Minimize complexity in the operational environment • Reduce implementation risk by having a single provider take end to end responsibility for business continuity	• HP StorageWorks XP disk array • HP management tools including CommandView XP Advanced Edition, Continuous Access XP Journal, XP Replication Monitor, Performance Advisor XP, Remote Web Console, and RAID Manager XP • HP consulting and support services • HP storage, SANs, and servers implemented by HP Global Services	• Compliance with federal mandates for disaster recovery sites • Reduced concentration risk • Increased business continuity in the event of area-wide or regional disruptions

- **HP StorageWorks Continuous Access XP Journal** is an HP StorageWorks XP "array-to-array" mirroring product that extends the asynchronous solution by replacing the cache-based sidefile with dedicated storage devices. This method improves the ability to store overflow data by using larger and cheaper storage devices and improves the resiliency of the replication application. It is ideal for long-distance (up to 5,000km [3,107 miles]) replication solutions and overcomes the issues that the asynchronous solution can have with physical replication links that do not have sufficient bandwidth to cope with application I/O spikes or that might be sustainable for short periods of communication outages.

HP StorageWorks Continuous Access XP Journal solution for asynchronous replication

HP innovation and thought leadership have delivered a unique solution for mitigation of concentration risk through infrastructure architecture based on HP StorageWorks XP Disk Arrays, SAN components, and systems. By providing an end-to-end architecture, HP works with its clients to implement a risk mitigation strategy focused on geographic diversity as well as rapid recovery from component or line failures.

A key component of this architecture is the HP StorageWorks XP Disk Array. The XP disk array delivers state of the art reliability and "always on" availability for mission-critical applications where downtime is not an option. The XP disk array is designed with no single-point-of-failure, providing an extremely high level of component redundancy. In addition, nondisruptive online upgrades ensure that data is always available.

The XP disk array employs journaling in the asynchronous communication process. Writes are logged to cache and the journal before being communicated to the remote data center. Should communication links between the centers fail, or line speeds degrade, the XP disk array will buffer the writes and journal them to disk until the line becomes available. This journal can span terabytes and support extended outages or extended high-traffic periods that overrun the lines. When the lines are recovered or traffic overrun subsides, replication resumes.

The architecture ensures that the write order is maintained at the receiving XP disk array to support data integrity and consistency. Applications are abstracted from this process insulating the application systems and ensuring there is no slow down in processing.

The architecture is highly tolerant to line anomalies that would otherwise impact the performance of the applications. The goal is to keep processing and catch up quickly, with integrity.

Key advantages are as follows:

- Solution is certified by HP
- Journaling activity is transparent
- Journaling is possible from any site
- Delivers data integrity at remote data center
- Application agnostic
- Delivers end-to-end high performance

Operational resiliency and business continuity

A business continuity solution is only as effective as the company that designs, implements, and stands behind it. HP is one of the few providers that can deliver a certified, end-to-end solution that mitigates the risk of implementation. HP is unique in its ability to provide a comprehensive array of servers, SANs, and storage that reduces concentration risk. In addition, HP offers a blend of experience, domain expertise, world-class engineering, integrated support services, and single-source accountability to ensure operational resiliency.

Through its integrated solutions, HP provides

Information protection:

- Data—Traditional backup and recovery solutions based on tape libraries provide cost-effective protection. Advanced data protection solutions combine the use of disk copies and high speed tape to provide rapid backup and delivery.
- Data replication—Real-time remote mirroring ensures that data will survive a full data center disaster. It can be used with hot or cold site systems or remote clustering to achieve continuity for specific needs.
- Database—HP also provides expertise in deploying Oracle 9i Real Applications Clustering (RAC) to protect the database that holds critical data.

Disaster-tolerant computing:

HP experts can design and implement an infrastructure that ensures that demanding availability and recovery objectives are met. Examples of these solutions include:

- Metrocluster with Continuous Access XP technologies provide high availability and data protection between data centers. This winning combination has resulted in a Gartner #1 ranking for instantaneous data recovery between two data centers located across town, across the continent, or on the other side of the world.
- NonStop servers provide high performance geographic disaster protection over unlimited distances.
- OpenVMS offers disaster tolerance as an integral element of the environment, along with Disaster Tolerant Cluster Services and Reliable Transaction Router middleware.

Business continuity and consolidation

HP plans and coordinates IT consolidation efforts with business continuity to ensure that infrastructure is protected from any increased risk.

Business continuity and On Demand solutions:

HP provides a new utility computing concept that enables a client to have additional capacity at a second data center to be used for continuity or peak load purposes. These solutions provide a cost-effective way to implement business continuity as part of an adaptive IT infrastructure.

The HP advantage

HP has over three decades of experience providing technology solutions and services to the global financial services industry. For example:

- HP has a significant presence in the global top 200 banks, top 50 brokerages, and top 25 insurance carriers.
- HP powers over 130 exchanges, including 18 of the world's largest exchanges.
- HP supports 95% of the world's exchange transactions.
- HP supports >51% of the world's trading desks.
- HP is a leader in credit card transactions and electronic funds transfers.
- HP has proven capabilities at many of the world's largest banks.

HP also has over 25 years experience implementing the technologies that provide the backbone of continuity—high availability, data protection, and disaster recovery. HP has successfully handled over 5,000 recoveries. With more than 70 recovery facilities located in 40 countries, HP can provide global monitoring, management, disaster rehearsal, and recovery capabilities.

For more information

HP Business continuity and availability solutions
www.hp.com/go/continuityandavailability

Financial services industry solutions
www.hp.com/go/fsi

HP StorageWorks solutions for business continuity and availability
www.hp.com/com/go/storageworks/bca

HP business continuity services
www.hp.com/go/businesscontinuity

Crisis in Continuity: Financial Markets Firms Tackle the 100 km Question
www.tabbgroup.com

Interagency Paper on Sound Practices to Strengthen the Resilience of the U.S. Financial System
www.sec.gov/news/studies/34-47638.htm

For more information, go to www.hp.com/go/continuityandavailability

4AA0-6584ENW, June 2006

invent